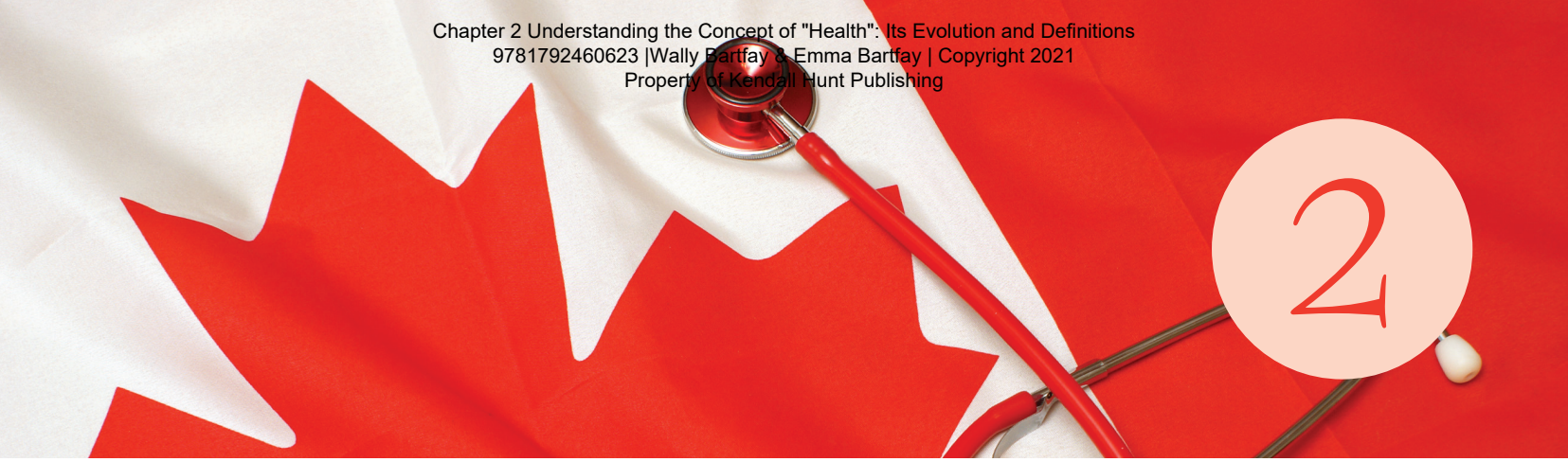


2

Understanding the Concept of "Health": Its Evolution and Definitions

Those who dwell among the beauties and mysteries of the Earth are never alone or weary of life.
—Rachel Carson, 1907–1964

Learning Objectives

After completion of this chapter, the student will be able to:

- List and critically examine historical events and forces that have shaped definitions of what health is and how it is believed to be maintained, achieved, restored, and promoted;
- Describe physical, biochemical, sociopolitical, cultural, spiritual, and environmental factors that can both negatively and positively affect the health of individuals, families, groups, and entire communities;
- Describe 3 strengths and limitations of the medical model of health;
- Describe how current holistic definitions of health have evolved based on research related to the social determinants of health; and
- Describe the role of public healthcare professionals and workers in maintaining, achieving, restoring, and promoting the health and well-being of Canadian residents and citizens across the life span.

Core Competencies addressed in Chapter 2

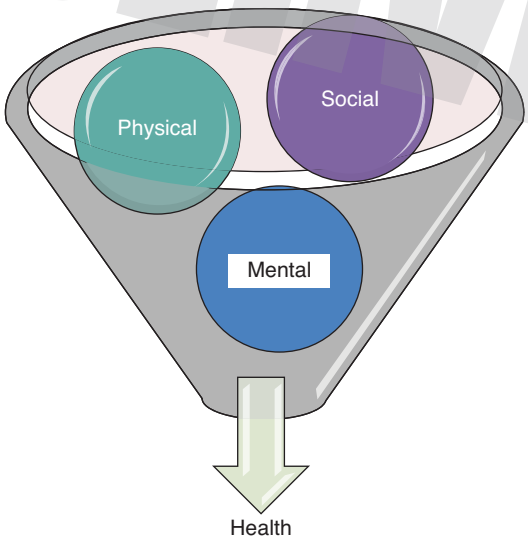
Core Competencies	Competency Statements
1. Public Health Sciences	1.1, 1.2, 1.4, 1.5
2. Assessment and Analysis	2.1, 2.2, 2.4, 2.5, 2.6
3. Policy and Program Planning, Implementation, and Evaluation	3.1, 3.2, 3.3, 3.6
4. Partnerships, Collaboration, and Advocacy	4.1, 4.3, 4.4
5. Diversity and Inclusiveness	5.1, 5.2
6. Communication	6.1, 6.2
7. Leadership	7.1, 7.2, 7.3, 7.4

Note: Please see the following document or web-based link for a detailed description of these specific competencies (Public Health Agency of Canada, 2007).

Introduction

The concept of "health" may be regarded as a ubiquitous and dynamic term with diverse interpretations, contexts, and meaning to individuals in different cultures and across the life span (Bartfay 2010a; Bartfay and Bartfay 2015). For some, being healthy simply means the absence of acute or chronic disease. By contrast, individuals living with a chronic communicable (e.g., human immunodeficiency virus [HIV]) or non-communicable disease (NCD) (e.g., type I diabetes mellitus) may regard themselves as being healthy. For others, health means a positive sense of soundness, wholeness, and wellness between one's psychological, spiritual, sociopolitical, environmental, and biological states of being. For others, health is viewed as a positive resource and basic human right for all global citizens. Indeed, there is currently no universally employed or accepted and unwavering standardized definition of health for all concerned.

In 1948, the World Health Organization (WHO, 1948) declared that "health is not merely the absence of disease or infirmity but a state of complete physical, mental and social well-being" (see Figure 2.1). This definition of health has been highly criticized because of its utopian vision is an unattainable ideal by



Source: Wally J. Bartfay

Figure 2.1 Conceptual Diagram of the WHO (1948) Definition of Health

Source: Adapted from World Health Organization (1948).

many clients in the real world. Moreover, it unintentionally contributes to the medicalization (i.e., control) of society by physicians and other healthcare professionals to achieve health for all. We shall explore the concept of medicalization in great detail below under the section entitled "Public Health Activities in Canada: 1900–1950." Lastly, it may be argued that this definition of health as "complete well-being" is no longer relevant or meaningful for purpose given the rise of a variety of NCDs globally including depression, bi-polar disorder, cardiovascular disease, cancer, diabetes, chronic obstructive pulmonary disease (COPD) to name but a few. The reader is referred to Chapter 14 for a detailed discussion on NCDs.

In fact, it may be argued that **health** is not a single state or goal, but a process that involves various interconnected and interdependent factors and dynamic states of existence across the life span (Bartfay and Bartfay 2015). Health is not a single lineal destination, but a dynamic and complex interactive journey through one's physical, biochemical, sociopolitical, cultural, and spiritual environments.

Our understanding of the concept of health and the evolution of various definitions of this state of existence over time is closely associated and interwoven with the history of agricultural societies and the development of various civilizations; the growth of religious practices and beliefs; shamanism and other healing practices; pharmacy; medicine, nursing, and developments in public health. The word *health* is derived from the old Anglo-Saxon word "haelth," which is derived from the Proto-Germanic word *hailitho* referring to a general state of mental and physical soundness or wholeness, and the old English word "haelan" meaning to heal (Harper 2013; Thompson 2010). However, the meaning of this word has evolved overtime due to a better understanding of a variety of factors and determinants, which can either negatively (e.g., smoking, genetic pre-disposition to breast cancer) or positively (e.g., exercise, diet low in saturated and trans fats) affect this state of existence.

Accordingly, in this chapter, we shall attempt to collectively examine how these influences and factors have collectively shaped our current understanding of this critical concept. Indeed, it is critical for all public health professionals and workers to first have a clear understanding of what the concept of health entails if their mandate is to preserve, promote, and/or restore the health of individuals, families, groups, communities, or entire populations. Accordingly, we shall survey evidence-informed holistic definitions of health and how they influence current Canadian public healthcare policy and practice directives. We shall also examine how the dominant mechanistic medical model of health has evolved overtime, and its influence on our current public health care systems in Canada. Lastly, we shall highlight the many Canadian influences that have helped to shape this dynamic and evolving holistic concept of health from the growing global perspective and need.

Group Activity-Based Learning Box 2.1

What exactly does the concept of "health" mean to you?

The Group Activity-Based Learning Box 2.1 is designed to stimulate classroom discussions and debate related to the concept of health; what it means to you currently, and how it is maintained and promoted. Working in small groups of 3 to 5 students, discuss and answer the following questions:

1. How would your group define health?
2. How does your group's definition of health compare and/or contrast with other definitions of health in your class?
3. What factors and behaviors does your group believe are important for contributing to the health of Canadians across the life span?
4. How do these factors and behaviors compare and/or contrast with other groups?
5. Based on your group's definition of health, can an individual with a chronic communicable disease (e.g., human immuno deficiency virus [HIV], hepatitis B) and/or non-communicable disease (e.g., diabetes, heart disease, arthritis, and bipolar disorder) be healthy? Why or why not?

A Brief History of Health

This section provides a brief historical account of our understanding of the concept of health from pre-historic times to current times. Although a description of all major social, cultural, political, religious, and scientific influences is beyond the scope and purpose of this chapter, we shall examine critical historical milestones and reflect on their legacy and continued importance. We shall examine how the mechanistic medical model of health has come to dominate societal perspectives of what health is and how it should be delivered since the turn of the 20th century. Lastly, we shall highlight and examine major Canadian contributions made during the 21st century to recent developments in our understanding of holistic definitions of health based on various social determinants of health (SDH), and their impact from a global perspective. The term "social determinants of health" is defined as the structural determinants and conditions of daily life responsible for a major part of health inequities between and within countries (e.g., distribution of power, income, access to healthcare, education, work and leisure, state of their housing, and environment) (World Health Organization Commission on Social Determinants of Health 2008). Hence, the term "social determinants" may be regarded as shorthand for the various social, political, economic, environmental, spiritual, and cultural factors that affects the health of individuals, families, groups, or entire communities across the life span (Baum 2008; Mikkonen and Raphael 2010; Raphael 2010; Rootman et al. 2012).

Pre-historic Times

Based on archaeological evidence, the establishment of settled permanent communities first occurred during the Neolithic period of the eighth millennium BCE in the Near East, and then spread to northern parts of Europe during the fourth millennium BCE (Hanlon and Pickett 1984; Polgar 1964). There is evidence to demonstrate that these early societies employed a variety of health-related interventions including banishment and isolation of individuals with overt signs of disease, voodoo and other forms of psychosomatic medicine, and fumigation (Hanlon and Pickett 1984).

Both men and women in these early societies functioned as healthcare providers who were often trained priests, priestesses, shamans, or so called "witch doctors." These primitive healthcare providers sowed the seeds for all future forms of healthcare and therapeutics including medicine, nursing, midwifery, and pharmacology (Bartfay and Bartfay 2015). As the caste of healers developed, a distinct class of practitioners became associated with this trade (Donahue 1996; Hanlon and Pickett 1984). These individuals were often women of the tribe who applied treatments, ascertained certain qualities of drugs, learned how to decrease a fever, and became skillful in dressing wounds.

The worship of nature became a logical vehicle upon which primitive agricultural societies based their healing practices, mythologies, and religious practices (Bartfay 2010a; Bartfay and Bartfay 2015). The belief in evil spirits, angry gods, or deities as the root cause of all ill health and disease first emerged during this period (Goodnow 1942; Nutting and Dock 1937). Accordingly, religious

Source: Wally Bartfay

Photo 2.1 A replica of an ancient Viking/Norse temple with various deities based on powerful animals and/or nature.

leaders were often given the responsibility for organizing worship for healing, and were also given the responsibility for administering care to the ill and injured by seeking divine aid and knowledge on how to prevent and cure illness and disease.

Ancient Egypt

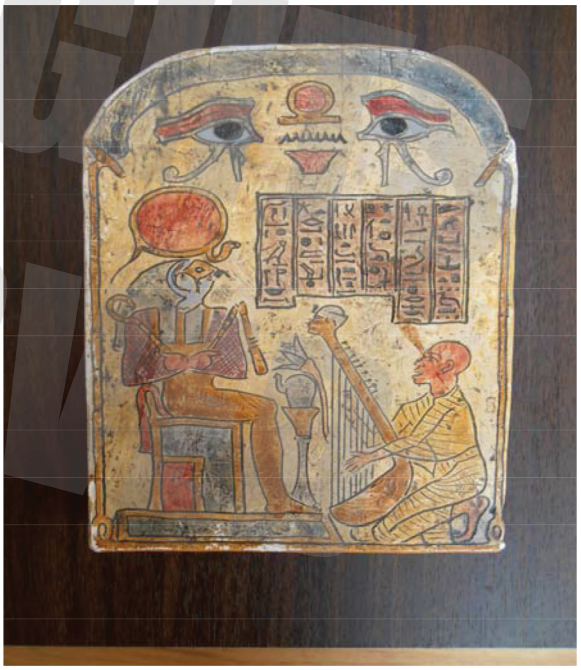
For more than 3,000 years, the Egyptians were ruled by kings called "pharaohs" who established a remarkable civilization along the banks of the Nile River (Jackson 2011; Porter 1997, 2011; Renouard 2010). Like pre-historic societies, some of the beliefs related to health and disease of these ancient Egyptians were based on mythology and spirituality. For example, "Bes" was an ancient Egyptian god with the mandate of frightening away evil spirits associated with disease and illness in society. In the old kingdom, Bes was shown to be associated with fertility, circumcision, and various harvest rituals. By the middle kingdom, he had evolved into a guardian of the home, infants, and new mothers and was a protector of pregnant women. Nonetheless, their knowledge of disease and states of health were increasingly based on empirical observations of human anatomy, clinical diagnosis, and medical interventions (e.g., surgery, pharmacological preparations) (Bartfay and Bartfay 2015). Notably, several ancient papyri scrolls were discovered in the dry sands of Egypt, which contain one of the most complete examples of ancient beliefs related to health and healthcare practices (Breasted 1930; Nunn 2002).

According to Edwards (1892), the finest example was the celebrated Ebers Papyrus, which was bought at Thebes by Dr. Ebers in 1874. The papyrus is 110 pages total, and each page consists of approximately 22 lines of bold hieratic writings which has been described as an *Encyclopedia of Medicine* as known and practiced by the Egyptians of the 18th dynasty.

Several of these scrolls were subsequently located and named after their discoverers including the Brugsch, Ebers, Kahun, Smith, Hearst, Berlin, and London papyri scrolls (Berdoe 1893; Breasted 1930; Edwards 1892; Nunn 2002). For example, the Papyrus Ebers provides detailed written evidence regarding their anatomical knowledge of the human body, its various organs, and vessels:

> 46 vessels go from the heart to every limb, if a doctor places his hand or fingers on the back of the head, hands, stomach, arms or feet then he hears the heart.
>
> (Retrieved June 10, 2010 from http://www. historylearningsite.co.uk/a-history-of-medicine/ancient-egyptian-medicine/)

Interestingly, these scrolls reveal that health and disease were attributed to both natural causes and to supernatural causes. The physician and healer Imhotep (circa 2900–2800 BCE) is often credited as being the founder of Egyptian medicine during the third dynasty and is believed to be the original author of the Edwin Smith Papyrus, which may date to as early as 3000 BCE (Breasted 1930; Bryan 1930; Nunn, 2002). Imhotep was the physician to King Zozer who was also a renowned surgeon, a temple priest, magician, and an architect for one of the Pharaohs temples. He was so successful



Source: Wally Bartfay

Photo 2.2 The Stele of Horus (Egypt–New Kingdom Era). This plaque portrays a sick man who sings a lament on a harp to the seated god Horus, son of Osiris and the goddess Isis. Horus was worshipped for centuries as the god of healing. At the top, we see the "Eye of Horus," which has come down over the centuries to represent the Rx sign commonly see on prescriptions today.

that the ancient Egyptians elevated him to the rankof the Egyptian god of medicine and healing. The earliest known surgeries were performed in Egypt around 2700 BCE, and are detailed in the Smith Papyrus. Public medical institutions, referred to as "Houses of Life," were established in ancient Egypt by the first dynasty (Donahue, 2006; Nunn, 2002). Interestingly, by the time of the 19th dynasty, some workers in ancient Egypt enjoyed benefits including medical insurance, pensions, and sick leave.

Source: Wally Bartfay

Photo 2.3 Egypt is one of the best known and documented ancient civilizations dating to as far back as 3000 BCE, with extensive written records employing, cravings, hieroglyphics, and papyri scrolls with ink.

Persians

By approximately 500 BCE, the Egyptians were conquered by the Persians from present-day Iran (Jackson 2011; Porter 1997, 2011; Renouard 2010; Shryock 1959). The Persians adapted many aspects of ancient Egyptian culture and their healthcare practices. The Persians were also the first to introduce the sacred elements of fire, earth, and water, which latter served as the basis for alchemy. Alchemy, which was concerned with the transmutation of base metals into gold, later evolved into the present-day science of chemistry (Bartfay and Bartfay 2015).

The Emperor Darius of Persia is credited as being the first to establish a royal or governmental-funded medical center in history (Donahue 1996; Risse 1990). Darius renovated an old school to be utilized for the training of priest–physicians, which was largely modeled after ancient Egyptian medical practices. Nutting and Dock (1937) reported that 3 types of healthcare practitioners emerged from this medical center: (i) those who healed by the use of exorcism and incantations, (ii) those who used various plant-based herbal remedies, and (iii) those who healed using the knife (scalpel) for various surgical interventions.

Source: Wally Bartfay

Photo 2.4 A carving of Persian healer administering a decoction made from medicinal plants to his client lying in bed. The Vendidad, one of the surviving texts of the Zend-Avesta (1500 and 1200 BCE), distinguishes 3 kinds of healing: (i) those performed by the knife (surgery), (ii) those achieved through the ingestion or application of herbs and plants, and (iii) those achieved through divine hymns or incantations.

The Iranian born Muhammad Idn Zakariya Al-Razi (or Rhazes, 865–925 CE) became the first person to describe in detail smallpox and measles (Martin-Aragus et al. 2002). His *Comprehensive Book of Medicine* provided useful insights into many diseases and was very influential in European medical schools.

Abu-al-Qasim (Abulcasis) wrote the influential 30-volume medical encyclopedia entitled *Kitab al-Tasrif* (1000 CE), and is also credited by some scholars as being the father of modern surgery (Martin-Araguzetal 2002; Saadetal 2005). Ibnal-Haytham (Alhacen) made important advances in eye surgery and he is credited as being the first to correctly explain the process of sight and visual perception in his work entitled *Book of Optics* (1021 CE) (Saad et al. 2005).

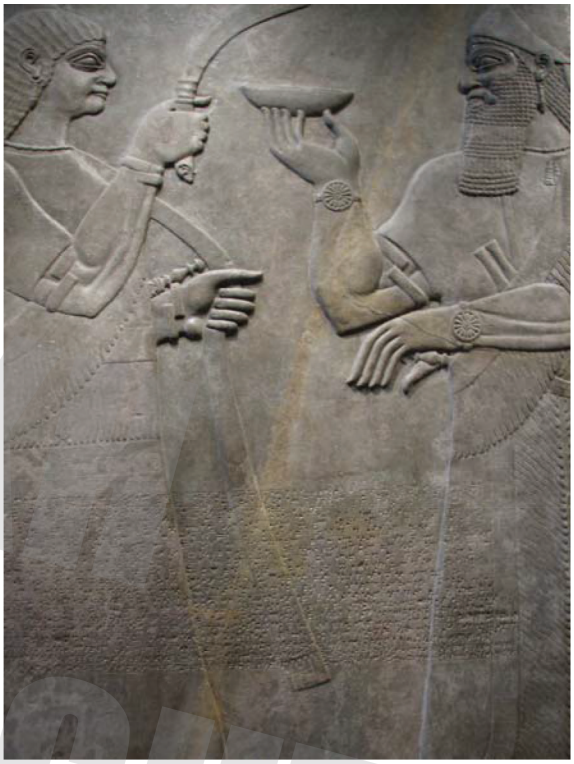
Traditional Chinese Medicine

The philosophy of traditional Chinese medicine was derived from both empirical observations of disease and illness by Taoist healers and physicians, and the belief that individual human experiences express causative factors in their environment (Jackson 2011; Porter 1997, 2011; Renouard 2010; Unschuld 2003; Wujastyk 2003; Zysk 1998).

Health and ways to achieve and maintain this state in ancient China is perhaps one of the first to focus on "holistic health," meaning the whole person, which also incorporated the prevention of illness and disease (Bartfay 2010a; Donahue 1996; Lyons and Petrucelli 1978; Unschuld 2003). Accordingly, health was defined as a state of harmony between the universe and the individual, and was achieved through the equilibrium of nature's energy dualities of *yang* (male principle) and yin (female principle) (Bartfay 2010a; Bartfay and Bartfay 2015). The yin force is described as being negative, cold, moist, weak, and lifeless. Conversely, the yang force is described as being positive, warm, dry, strong, and, full of life and light. The Chinese emperor "Fu His" (2900 BCE) created the *pa kua* symbol, which consists of yang and yin lines combined in 8 separate trigrams that characterize all the yin-yang conditions (Donahue 1996; Porter 1997, 2011; Unschuld 2003).

The ancient Chinese also believed that alterations to health or the presence of disease could be caused by evil spirits, demons, and/or animistic forces. Charms were often used to help ward off evil spirits and forces associated with altered states of health (Lyons and Petrucelli 1978; Porter 1997, 2011; Unschuld 2003). The charms were often transcribed onto paper, burned in a fire, and the ashes drunk in a form of a decoction or tea. Evil spirits could also be frightened off by loud noises (e.g., cymbals, drums, trumpets, fire crackers, and other loud noise makers).

The use of numerous plant-based extracts and herbal remedies were also employed to treat alterations to health. The Red Emperor, Shen Nung (Hung Ti), for example, wrote the famous herbal compendium known as the *Pen Tsao*. This compendium detailed the carefully investigated and clinically evaluated effects of 365 plant-based medications on clients (Donahue 1996).



Source: Wally Bartfay

Photo 2.5 Interestingly, the distinction between medicine and pharmacy as separate and distinct fields and professions occurred in 754 CE, when the first drugstores opened in Baghdad, Iraq (Hadzovic 1997; Syed 2003).

Source: Wally Bartfay

Photo 2.6 The yin-yang symbol representing the state of harmony between an individual and the universe is critical to the achievement of health in traditional Chinese medicine and healing practices.

Shen Nung is also credited as being the first to have compiled and drawn detailed acupuncture charts for preventing and treating various ailments (e.g., pain, headaches, circulatory and digestive problems). There is empirical evidence that has documented many clinical and health-related benefits associated with the ancient Chinese practice of acupuncture. For example, various carefully designed randomized clinical trials (RCTs) have documented the effectiveness of true acupuncture for the control of pain versus sham (placebo) acupuncture (Sodipo, Gilly, and Pauswer 1981; Vickers et al. 2012; Watawaba et al. 1978). In fact, it has been demonstrated that acupuncture treatment results in the release of endorphins into the circulatory system, which are morphine-like substances that block pain receptors.

Source: Wally Bartfay

Photo 2.7 The Chinese dragon often seen during ceremonies and accompanied by clashing cymbals and firecrackers to ward off evil spirits and demons. These practices remain a vital component of many present-day Chinese celebrations and festivals (e.g., Chinese weddings, New Year celebrations).

Ancient India

The Atharvaveda, a sacred text of Hinduism dating from the Early Iron Age, is regarded as the first known medical text in India (Wujastyk 2003; Zys 1998). Ancient Indian medicine was based partially on practices of exorcism of demons and magic, in addition to the use of plant-based pharmaceuticals and surgical procedures (Porter 1997, 2011; Wujastyk 2003; Zysk 1998). For example, ancient Hindu physicians often employed plants with somatic and hypnotic properties including *Cannabis indica*, *hyoscyamus*, and *henbane* in their practice. The scholarly system of Indian medicine known as *Ayurveda*, originated in post-Vedic India, and its 2 most famous medical texts belong to the schools of Charaka (or Charaka Samhita; circa 300 BCE) and Sushruta Samhita (or Susrutasnhita; third and fourth century CE) (Wujastyk 2003; Zysk 1998).

Operations, such as tonsillectomies, were often performed in India, and which remained unfamiliar to the later Greek and Roman surgeons (Donahue 1996). Furthermore, approximately 125 surgical instruments were employed by Hindu surgeons who performed

Source: Wally Bartfay

Photo 2.8 Historically, opium derived from these poppies (*Papaver somniferum* L. and *Papaver bracteatum*) have been used medicinally primarily as an analgesic for pain relief and to induce sedation in clients. Poppy extracts have also been used in traditional Chinese medicines as smooth muscle relaxants, making them potentially useful in the treatment of diarrhea and abdominal cramping and prescribed as an antitussive.

operations such as amputations, excised tumors, repaired hernias and harelips, removed bladder stones, couched cataracts, reconstructed noses damaged in battle, and delivered infants by caesarean section (Bartfay and Bartfay 2015). *Ayurveda* is derived from the Sanskrit word that means "knowledge of life and longevity," and is based on the principles and rhythms found in nature (e.g., one's pulse). The normal length for the training of practitioners of Ayurvedic medicine was 7 years, and the teaching of relevant subjects (e.g., surgery, obstetrics) were interwoven with hands-on experiences (Wujastyk 2003; Zysk 1998).

The emergence of the first hospital-like structures termed *xenodocheions* (or xendochiums) meaning *House of God*, occurred in pre-Christian India (800–600 BCE) and then in Europe (Dock 1932; Kelly 1975). There is no question based on the recorded historical evidence that hospitals of some sort were built during this period as centers for providing healthcare services to their citizens, and were staffed primarily by male healthcare providers including nurses, physicians, and priests (Donahue 1996; Jackson 2011; Renouard 2010; Shryock 1959). Shryock (1959) notes that during this time, it was regarded as more economical in nature to gather all classes of so-called *unfortunates* into one institution known as a *xenodocheion*, which was the ancestor of the modern hospital as well as most other types of charitable institutions.

Source: Wally Bartfay

Photo 2.9 A traditional Chinese pharmacy in Hong Kong, which employs an assortment of carefully selected and weighed plants, herbs, and animal products in the preparation of medicines to treat a variety of ailments, conditions, and diseases, and to restore harmony between an individual and nature.

Ancient Greece

The Greeks had a rich culture and mythology composed of various gods of the earth and underworld, and special healing agents including snakes and symbols were integrated in medicine and other healing practices (Donahue 1996; Lyons and Petrucelli 1978; Porter 1997, 2011). *Apollo,* who was the son of Zeus and Leto, was the god of medicine and healing, whether through himself or mediated through his son Asclepius. Apollo was also portrayed in ancient Greece as a god who could bring ill health and deadly plague when angered. He was also known as the god of music, poetry, art, oracles, archery, sun, light, and knowledge to the ancient Greeks.

The Greek scientist and philosopher *Thales* (approximately 640–546 BCE) is credited as being the first to use science, as opposed to religion, metaphysical reasons, and/or mythology, to explain natural processes and the universe. Later, *Aristotle* (384–322 BCE) had a profound influence on healthcare and medicine in Greece and abroad, and he also laid the foundations for biology and comparative anatomy. The first known Greek school of medicine opened in Cnidus in 700 BCE on the Carian Chersonese, located on the southwest coast of Anatolia. The city was an important commercial center, and also the site of the observatory of the astronomer *Eudoxus*. *Alcmaeo*n, author of the first anatomical compilation in Greece, worked at this school in Cnidus, and it was here that the practice for the need of careful observation and empirical monitoring of clients was first established.

© National Museums Scotland

Photo 2.10 An example of a curing and healing mask from Sri Lanka, Asia, which was carried during special rituals performed to please the demon gods and cure sick villagers. This mask represents the "sickness demon" with his 8 servant demons that each rep resents a different disease or condition.

It is quite apparent, however, that the ancient Greeks incorporated many Egyptian-derived substances, plants, and herbal preparations into their own pharmacopoeia. This influence became even more pronounced after the establishment of a school of Greek medicine in 330 BCE in Alexandria, Egypt, which was known as the "Empirical School." In keeping with the Greek philosophy, *Aristotle*, the tone of the scientific and medical research conducted at the medical school in Alexandria was very open-minded and empirically or observation based. This medical school also attracted the best physicians and medical scholars from Greece, and became instrumental in the transmission of Greek medicine to Rome after the Roman conquest of Egypt. As a consequence of *Alexander's the Great* conquests, Arab, Turkish, and Persian peoples of the Middle East were exposed to the medical teachings and philosophies of the Greeks.

Hippocrates of Cos (Kos) (460–370 BCE) was one of the first to employ case histories to describe various ailments, treatment outcomes, and complications in a collective work entitled the *Epidemics* (Donahue 1996; Lyons and Petrucelli 1978). Case histories are still utilized today by various healthcare professionals (e.g., physicians, nurses) for clinical practice and research purposes. Hippocrates was also one of the first to teach his students and fellow healthcare providers that ill health or disease did not result from the work of evil spirits, demons, or gods, but resulted as a consequence of a break in a law of nature or the universe (Bartfay 2010a; Bartfay and Bartfay 2015; Swanson and

Source: Wally Bartfay

Photo 2.11 Ancient Greece was made up of many independent city states and temples to worship the gods. Originally, ancient Greeks believed that illnesses and disease were "divine punishments" and that healing was a "gift from the Gods." However, by the fifth century BCE, there were attempts to identify the material causes for illnesses and disease via scientific enquiry, which led to a movement away from spiritual causes or angry gods.

Source: Wally Bartfay

Photo 2.12 This votive relief shows Archinos (or Amphiaraus)—the legendary king of Argos—seer and the chthonian god of healing, appears as a healer–priest who supports himself with a staff while tending to the wounded arm of a client. Ceremonies performed in the Aesculapian Temple of Sanatoria featured holy snakes that were apparently trained to "lick the ailing parts of the sick" while soft music was played to lament them. *Popona* was a special "snake biscuit" sold to sick clients who fed it to serpents in the hope of being healed. The Greek symbols of the staff and serpents have come down over the centuries to epitomize medicine.

Albrecht 1993). Consequently, public healthcare and medicine focused on "cure" as opposed to prevention for the first time in recorded history. Figure 2.2 is a conceptual representation of the 4 body humors of disease causation, as described by Hippocrates, based on the belief that the health was achieved by maintaining a balance between the 4 body humors identified as: (i) phlegm (phlegma), (ii) yellow bile (khole), (iii) black bile (melagkholikos), and (iv) blood (sanguineus) (Aschengrau and Seage 2003; Lyons and Petrucelli 1978).

For example, if a client had a fever, he would treat it with cold. Likewise, individuals who were weak were prescribed exercise to build up their muscles. This is a critical milestone in the evolution of our understanding of health and its definition based on natural causes, as opposed to those associated with supernatural forces that could not be controlled or manipulated by mortal man.

The *Hippocratic Corpus* remains an important collection, composed of approximately 70 volumes from ancient Greece (Jackson 2011; Porter 2011; Renouard 2010). Many of his detailed descriptions, symptomatology, clinical findings, surgical treatments, and prognosis remain relevant to present-day healthcare professionals such as physicians and nurses (e.g., thoracic empyema). He was the first to categorize illnesses such as acute, chronic, endemic, and epidemic, and employ the terms exacerbation, relapse, resolution, crisis, paroxysm, peak, and convalescence to medical practice. Hippocrates was also the first recorded chest surgeon and is famous for being the first to describe clubbing of the fingers as an important clinical symptom associated with heart disease, respiratory disorders, and lung cancer. In fact, clubbed fingers are still often clinically referred to as "Hippocratic fingers." Interestingly, many medical students upon graduation still take the Hippocratic Oath, which emphasizes the *cure* directive of medical practice geared toward single client outcomes and directives, as opposed to groups, communities, or entire populations (Bartfay 2010a; Bartfay and Bartfay, 2015).

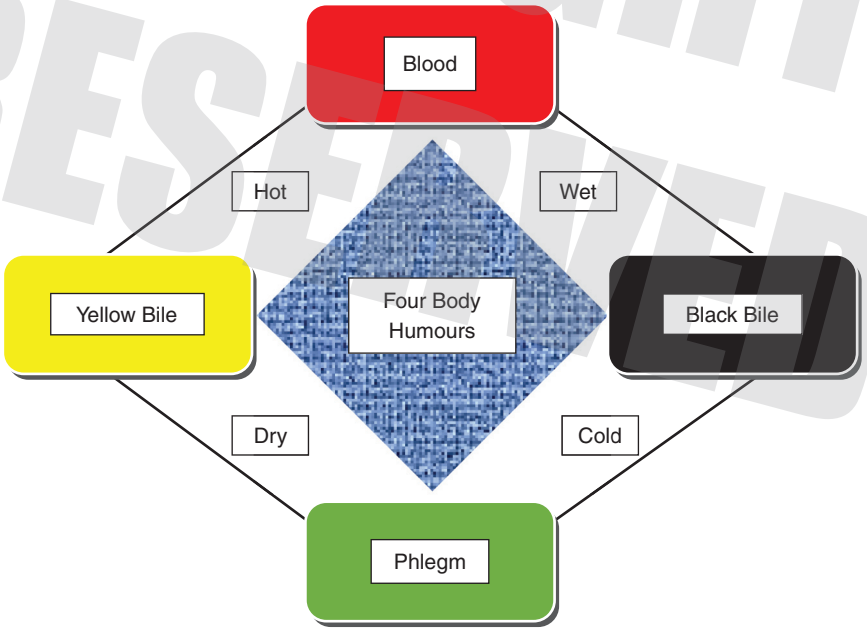


Figure 2.2 The 4 Body Humors of Disease Causation. Hippocrates was the first to introduce a theory of disease causation that revolved around the belief of an imbalance in the 4 body humors. Remarkably, his theory was taught to medical students around the world for over 2,000 years following its conception.

Ancient Rome

Rome was founded in 753 BCE, and in 510 BCE, the city had officially become a republic (Jackson 2011; Porter 2011; Renouard 2010). The Roman Empire reached its greatest extent in AD 117 and enjoyed approximately 300 years of prosperity. The Romans borrowed and adapted a great deal from the ancient Greeks, who first came into contact with them in approximately 500 BCE.

Source: Wally Bartfay

Photo 2.13 Roman aqueducts were carefully designed and engineeredto carry freshwater supplies from great distances away based on gravity and incline sloping, and many are still in use today in various European cities and towns.

Claudius Galen (131–201 BCE) was a famous Greek physician who studied at the medical school in Alexandria, Egypt, and went to Rome to seek his-fame and fortune (Davis and Park 1984; Dear 2001). At the age of 28, he became a surgeon to the gladiators and revived the methods favored by Hippocrates including his theory of the 4 humors. Galen was also the first to demonstrate that blood alone filled arteries, not air as previously thought, and that a surgeon could stop the bleeding from a vessel if he applied pressure to it with his fingers (Davis and Park 1984).

The Romans believed that altered states of health and disease were caused by natural sources, especially bad water supplies and raw sewage. Accordingly, they became experts at draining swamps and marshes to rid them of malaria-carrying mosquitoes. Julius Caesar, for example, drained the Codetan Swamp and planted a forest in its place.

> Care should be taken where there are swamps in the neighbourhood, because certain tiny creatures which cannot be seen by the eyes breed there. These float through the air and enter the body by the mouth and nose and cause serious disease.
>
> (Marcus Varro, Retrieved June 10, 2010 from http://www.historylearningsite.co.uk/medicine_in_ancient_rome.html)

The Romans were outstanding engineers who built long and elaborate aqueducts and viaducts to bring fresh water into their towns and cities for drinking, toilets, and for the many baths they constructed (Jackson 2011; Porter 2011; Renouard 2010). Roman houses were also equipped with toilets, and several public toilets were also built. By 315 BCE, Rome had an estimated 150 public toilets that were flushed clean by continuous running water from the aqueducts. The Romans also valued personal hygiene and several baths were

Source: Wally Bartfay

Photo 2.14 Ruins from an ancient Roman hypocaust in Chester, England (circa 75 AD). Roman houses and baths were often heated by an elaborate hypocaust, or central heating system, that diverted hot air form burning firepits which provided heat under ceramic floors and into the cavities of specially designed hollowed walls.

built throughout their Empire, which were used by both the rich and poor alike. For example, one of the most famous of these Roman baths is located in City of Bath in England (aka *Aquae Sulis* by the Romans). Roman buildings and baths were heated by a hypocaust, or central heating systems that diverted hot air from burning firepits up under the ceramic floors and into the cavities of walls (Jackson 2011; Porter 2011; Renouard 2010).

The genius of the Romans was not in the establishment of rationale or scientific medicine per se, but in their colossal engineering feats involving public sanitation and drains, aqueducts, roads, the draining of marshes infested with mosquitoes, systems of central heating for buildings and homes, proper cemeteries, and public baths (Lyons and Petrucelli 1978; Nutting and Dock 1937). The Romans were also the first to employ public physicians to provide care to their citizens in surrounding towns and villages. They also provided care to the poor and were permitted to charge a fee to the state for those who could not pay for their healthcare services provided (Swanson and Albrecht 1993). Moreover, several Roman families paid an annual tax or user fee for healthcare services. In fact, it may be argued that the concept of a national public healthcare system first originated in ancient Rome (Bartfay 2010a; Bartfay and Bartfay 2015).

Swanson and Albrecht (1993) report that in ancient Rome, a prototype of a health maintenance organization or group practice emerged, where several families paid an annual fee. In addition, hospitals, a variety of surgical procedures, and infirmaries for slaves as well as long-term nursing home–type structures appeared during this period. A hospital was established by a wealthy Christian women known as *Fabiola* in the fourth century in Rome, and this model was repeated throughout medieval times (Swanson and Albrecht 1993). In fact, the Romans believed that everyone in their Empire was entitled to good health, and therefore the Romans were the first civilization to introduce a program of public health for all their citizens regardless of their age, wealth, or social status. The Romans considered that a healthy mind equaled a healthy body, and that individuals should devote time each day to exercise and keeping fit (Hortmanshoff et al. 2004; Lyons and Petrucelli 1978; Nutting and Dock 1935). Paradoxically, this remains a major challenge in Canada today with the growing number of children and adults who are sedentary by nature.

The Romans were the first to document various occupational health hazards, and devised interventions to help limit injury or death for vulnerable workers (Rosen 1958). For example, the Romans paid particular attention to the health of miners who were at risk of suffocation from toxic fumes, miner's lung, traumatic amputations, and premature death. Accordingly, one of the earliest mentions of safety equipment involves the use of bags, sacks, and masks made from the membranes of various animals and bladder skins to help protect the lungs of Roman miners. Mining remains one of the most dangerous occupations globally, accounting for approximately 12,000 preventable deaths annually (Shaw Media 2011). For example, between the years 2006 and 2009, 80 workers died in Canada's mining, quarrying, and petroleum industries. By comparison, 34 deaths occurred in the United States and 2,631 deaths occurred in China (Shaw Media 2011). Donahue (1996) notes that the Romans were also advanced in military medicine and hospitals, and provided first aid on the battlefields and field ambulance services for their soldiers.

Source: Wally Bartfay

Photo 2.15 The Middle Ages is characterized as a period of intense, powerful, and rapid growth in the belief for supernatural or metaphysical causes of diseases and illness; the rise of political power and influence of the Catholic Church in Europe; and numerous military conflicts between rival regions and countries.

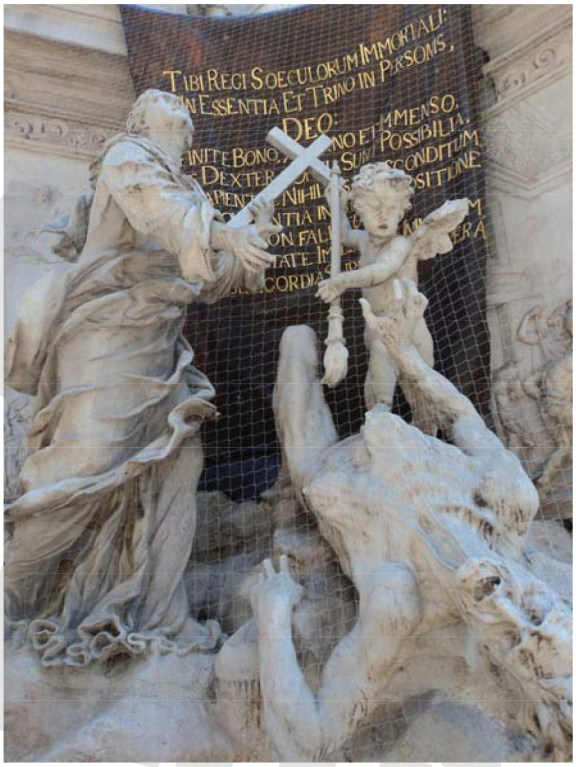
The Romans also invented numerous surgical instruments including the surgical needle, cross-bladed scissors, and specula and forceps for delivery of infants.

The Middle Ages

The Middle Ages represents the time period between the fall of the Roman Empire (476 CE) to the fall of Constantinople (1453 CE). Following the collapse of the Roman Empire, healthcare became progressively more localized in nature on the European continent, and folk medicine supplemented what remained of the medical knowledge of antiquity (Jackson 2011; Porter 1997, 2011; Renouard 2010). During the Middle Ages, the domination of healthcare and society in Europe by the Catholic Church was practically unchallenged (Neuburger 1910; O'Lynn 2007). Folklore cures and potentially poisonous metal-based compounds (e.g., mercury, arsenic, and lead) were popular treatments for many ailments and conditions.

Due to population growth in Europe, the occurrence of communicable diseases such as smallpox, measles, diphtheria, and the bubonic plague characterize this period (James 2003; Rosen 1958). During the reign of the Roman Emperor Justinian (527–565 CE), bishops were given authority over all hospitals. Consequently, the number of charitable hospitals and shelters increased dramatically in the empire, as did the number of religious orders founded to care for the sick and the poor (Bartfay and Bartfay 2015). For example, St. Ephrem served as a deacon in Edessa (located in present-day Turkey) in 350 CE at the time of a serious plague outbreak.

He collected money from wealthy patrons in the town and bought 300 beds, which he installed in public porticoes and galleries to care for the sick. Ephrem visited the sick daily and administered nursing care to many of the clients himself (O'Lynn 2007).



Source: Emma Bartfay

Photo 2.16 A plague memorial in Vienna, Austria. During the 14th century in Eurasia, an estimated 75 to 200 million people died as a consequence of the "Black Death" (aka Bubonic plague). It is estimated that over 1,200 victims died daily in Vienna alone at the height of the pandemic.

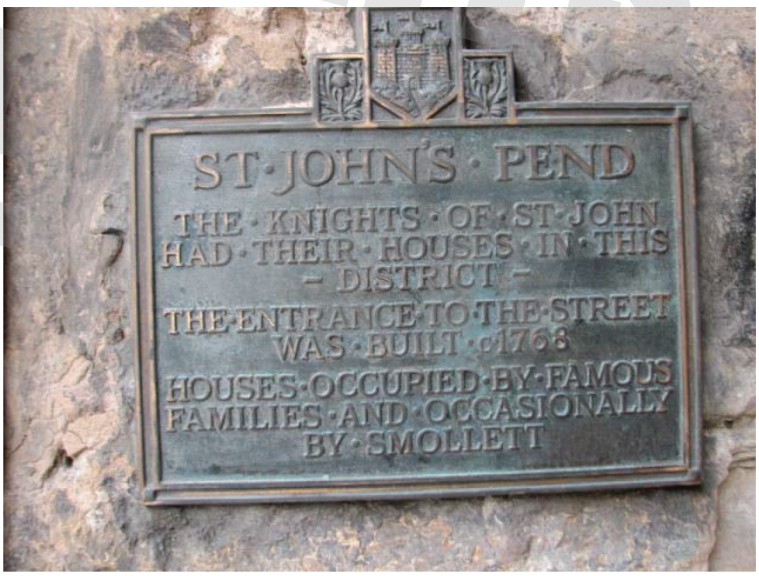
The Middle Ages is characterized by an amplified belief in supernatural or metaphysical causes of disease, illness, and alterations to health, and the growth of religious nursing orders to administer healthcare services to residents in the region (Bartfay and Bartfay 2015). It is interesting to note that significantly more male deacons and monks practiced nursing during the Byzantine Empire (Later Roman—fourth century CE), in comparison to female deaconesses and nuns (Bullough 1993; Pelley 1964). For example, the Parabolani brothers (circa 300 CE) of eastern Rome were an early organization of male nurses whose name literally means *those who risk their lives by coming into contact with the sick* (Donahue 1996). It is believed that this brotherhood originated as a consequence of the *Black Plague*, which devastated entire populations of the Mediterranean basin and many parts of Europe. A non-military nursing order known as the Brothers of St. Anthony cared for victims of the disfiguring skin disease erysipelas, which was later renamed St. Anthony's fire after the brotherhood (Bartfay 2010a; Evans 2004). Erysipelas is a superficial cellulitis that classically occurs on the cheeks of the victim, although it can occur anywhere on the body or extremities. It is caused by *β-hemolytic streptococcus* (i.e., streptococcal infection) and occurs predominantly in infants and in adults greater than 30 years of age (Bartfay and Bartfay 2015). The church also took over the care of victims of leprosy, and employed hygienic codes from Leviticus in the Bible and established isolation communities and leper houses known as "leprosaria" (Swanson and Albrecht 1993).

A critical mass of individuals is required to maintain a disease in endemic proportions (Bartfay and Bartfay 2015). The sexually transmitted infection (STI) syphilis, for example, originated as a non-venereal disease and evolved into one as a result of increased population densities (Hudson 1965). Similarly, it has estimated that approximately 1 million individuals are required to sustain measles at an endemic level in a given population (Cockburn 1967). With population expansions and crowding in various cities and towns in Europe, came additional public health challenges in relation to the domestication of animals, food availability and supplies, irrigation, and sanitation demands (Polgar 1964; Rosen 1958).

For example, pollution has been known as a public health menace since biblical times. In Exodus, it was reported that all the water in the river stank. Leviticus contains the first written hygienic codes formulated by the Hebrews which dealt with laws governing both personal and community hygiene measures including disinfecting, controlling contagions, and sanitary practices including the protection of water and food supplies (Swanson and Albrecht 2003). Medical historians report that the Catholic Church was greatly influenced by the *Five Books of Moses*, which contains various health-related laws and rituals, including the isolation of infected individuals (Leviticus 13:45–46), the importance of washing one's hands after handling a corpse (Number 19:11–19), and the need to bury human excrement away from one's dwelling (Deuteronomy 23: 12–13) (Swanson and Albrecht 1993; Neuburger 1910).

The Middle Ages is further identified by historians as the period of the so-called "Holy Crusades" (Green and Ottoson 1994; Nutting and Dock 1937). The crusades were of great significance to the development of health services provided by trained individuals because they lead to an eventual decline in monasticism, further developments in medicine, the establishments of charitable hospitals on the European continent, and the establishment of various military nursing orders (Bartfay and Bartfay 2015; Frank 1953).

The crusades also served as a rallying point for the formation of a variety of military nursing orders including the Knights Hospitallers, Knights of St. John of Jerusalem, and the Teutonic Knights (Bullough and Bullough 1993; Dock and Stewart-Maitland 1932; Kalisch and Kalisch 1986). It is noteworthy that these nursing orders were also the first recorded field nurses, which is a specialized form of public health nursing that provides care to a community of military personnel as well as injured civilians as a consequence of war or conflicts (Bartfay 2010b; Bartfay and Bartfay 2015; Nutting and Dock 1937). The Knights of St. John were also the only historically documented military nursing order to provide care to the mentally ill. As part of their nursing legacy today, the British order of the Knights of St. John established the famous St. John's Ambulance Service during World War I (Bedford and Holbeche 1902; Hume 1940). This service continues to provide emergency public health services and classes in first aid and cardiopulmonary resuscitation (CPR) to individuals in many countries, including Canada.



Source: Emma Bartfay

Photo 2.17 A plaque commemorating the location of houses for the order of the Knights of St. John in Edinburgh, Scotland. Various military nursing knights provided care to the wounded on the battlefields, protected those who could no longer defend themselves, and were, in fact, the first documented public health nurses to provide care to individuals afflicted with leprosy in the world (Bartfay 1996, 2007; Bartfay and Bartfay 2015).

During the 12th century, the term "xenodocheia" (or xendochium) had disappeared and was replaced by the modern term *hospital*, a creation of the Knights Hospitallers for these healthcare institutions (Bullough 1994; Nutting and Dock 1937). The Knights Hospitallers were a military nursing

order that were given official recognition by Pope Celestin III in 1113 AC for the public health services they provided to the sick and poor, and for establishing various hospitals throughout Europe (Bullough and Bullough 1993; Davis and Bartfay 2001; Kelly 1975).

Subsequently, during the 13th century, a more modern type of secular hospital was sanctioned by Pope Innocent III, where nursing care was provided almost entirely by men in these medieval hospitals (Bullough and Bullough 1993; Davis and Bartfay 2001). Pope Innocent III encouraged the development of hospitals throughout Europe. Hospitals were erected principally to care for the poor who were sick, although they also served as orphanages, hospices for travelers, and almshouses (Bartfay 2010a; Donahue 1996). In fact, these hospitals were regarded as a place to keep, as opposed to cure clients per se. The cure directive that dominates modern acute care hospitals in Canada and elsewhere did not evolve until the late 19th century.

During the 14th century, approximately 25 million people died as a consequence of the bubonic plague (Black Death), which migrated from Asia to Africa, then spread through Crimea, Turkey, Greece, Italy, and up through the European continent (Green and Ottoson 1994; Swanson and Albrecht 1993). The Black Death arrived in Europe via 12 trading ships from central Asia, docked in Italian seaports, and then rapidly spread throughout the continent. Green and Ottoson (1994) provide some idea of the devastation of the pandemic by recanting the mortality rates in the following cities in Europe: Paris, 50,000; Seine, 70,000; Marseilles, 16,000 in just 1 month and Vienna, 1,200 daily victims; and in England 2 million died, which represents half the population of the entire country at the time. The Italian writer Boccaccio reported that there was a terrible outbreak of the plague in Florence in 1348, where pity and humanity were forgotten by the residents and families deserted their sick. The Black Death was, in fact, caused by a flea infected with the bacterium *Yersinia pestis*, which could be carried by rats (Bartfay 2010a; Bartfay and Bartfay 2015).

During this period, epidemics and pandemics were attributed to various natural causes including toxic fumes and gases known as *miasmas* (or miasis; e.g., swamp gases); comets, drought, and crop failures; severe storms, urban crowding, and poor sanitation (Bartfay 2010a; Bartfay and Bartfay 2015). During the 14th century, it was also widely known that infections could be spread through the contact of infected victims. Accordingly, cities and towns often engaged in various public health initiatives to help and control the spread of epidemics and disease, including limiting travel in their jurisdictions and various isolation and quarantine practices. **Isolation** is defined as the separation of an infectious individual for a defined period of time (e.g., 30 days) to prevent or limit the direct or indirect transmission of an infectious agent (Bartfay and Bartfay 2015). **Quarantine** is defined as the restriction of activities of individuals who remain diseased or symptom free but who have been exposed to an infectious agent (Bartfay and Bartfay 2015).

For example, in 1377, at Ragusa it was ruled that travelers from plague areas should stop at designated places and remain there free of disease for 2 months before being allowed to enter the city. Technically, this is the first official quarantine method on record (Green and Ottoson 1994). In 1383, Marseilles passed the first quarantine law and erected the first official quarantine station in Europe. In the City of Venice, the local government appointed 3 guardians of public health who promptly denied entry to the city of infected or suspected travelers, ships, and freight in 1374. In 1403, a quarantine of 40 days was imposed on anyone suspected of having the disease in many regions in Europe (Green and Ottoson 1994).

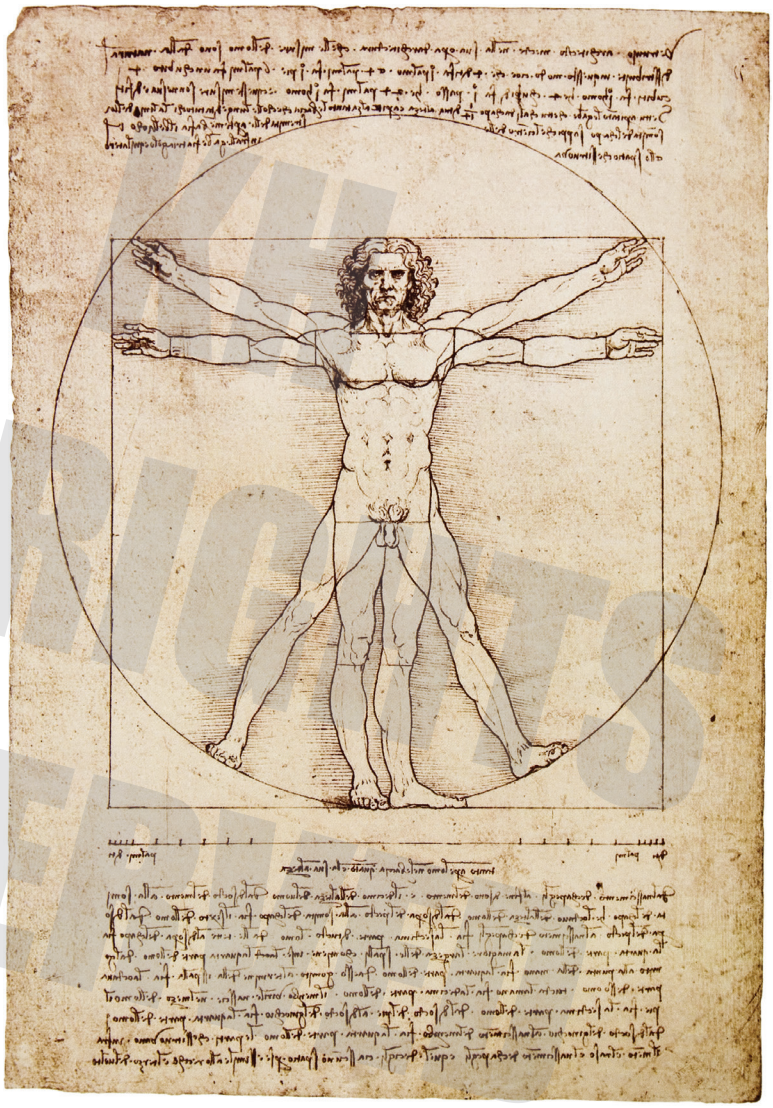
Interestingly, Canada established its first official quarantine laws in 1720 due to an outbreak of bubonic plague, which was carried to our shores by rat-infected ships from the Mediterranean (Bartfay 2010a; Swan 1966). An estimated 20,000 settlers died as a consequence of a cholera epidemic of 1832 in Upper and Lower Canada (PHAC 2008a). The Lower Board of Health created a quarantine station on Grosse Île located along the shores of the St. Lawrence River, for new settlers to Canada. The quarantine directive was reinforced by the military to prevent the spread of cholera into Upper and Lower Canada (PHAC 2008a).

The practice of isolating or quarantining individual remains as a common public health intervention today to both, contain and limit the spread of a known or suspectedinfectious agent. For example, during 2003, severe acute respiratory syndrome (SARS) pandemic, both suspected and known victims of this contagion were isolated and quarantined, and cross-border travel to the United States and abroad were also restricted to prevent its spread (Campbell 2006; Naylo, 2006). A total of 8,098 people worldwide became sick during

the 2003 SARS pandemic. In Canada, the federal government is responsible for the instigation of quarantine laws as detailed in section 91 of the British North American Act (aka Constitution Act, 1982) (Van Loon and Whittington 1976).

The Renaissance Period

The Renaissance period is marked by the fall of Constantinople in 1453 CE to 1600 CE (Bartfay 2010a; Green and Ottoson 1994). This Renaissance period produced various distinguished scholars and scientists including Copernicus, da Vinci, Galileo, and Vesalius, to name but a few. *Leonardo da Vinci*, for example, was one of the first individuals to dissert the human body, which was considered taboo by the Catholic Church in Europe during the 15th century. da Vinci often secretly dissected corpses at night, and produced detailed anatomical drawings of which more than 750 are still in existence today including those of the skeletal, muscular, nervous, and vascular systems (Lyons and Petrucelli 1978).



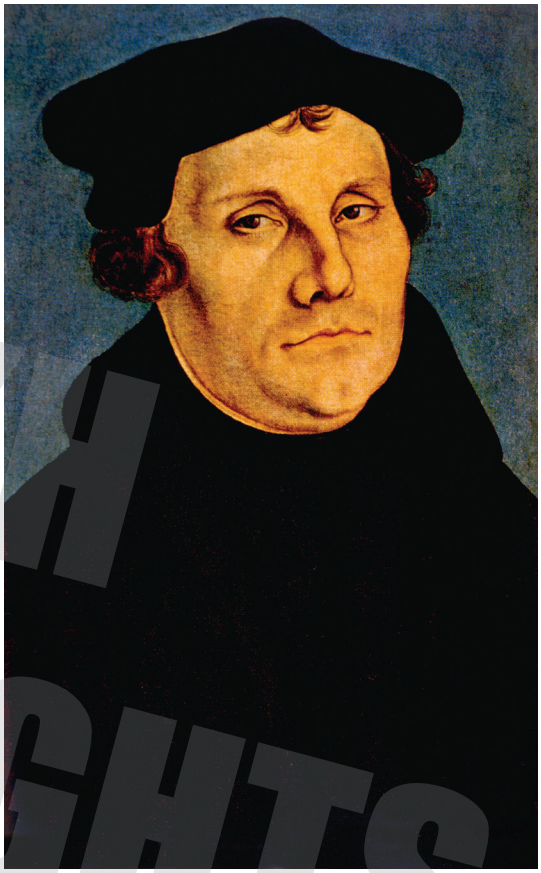
Jakub Krechowicz/Shutterstock.com

Photo 2.18 Leonardo da Vinci was the first to describe the human body as a "beautiful living machine." This remains a critical milestone in our evolution of the concept of health because it served as the foundation for the mechanistic medical model of health, which continues to dominate our publicly funded healthcare systems in Canada today (Bartfay and Bartfay 2015).

Fracastoro (1478–1553), a physician from Verona, is credited as being the first to theorize that tiny microorganism caused ill health or disease in 1546 (Greenand Ottoson 1994). It is interested to note that Francastoro envisioned these tiny disease-causing microorganisms before the discovery of the microscope and the germ theory of disease causation, as later detailed by Louise Pasteur (1822–1895) and Robert Koch (1849–1910) (detailed below). Fracastoro was also the first to note that syphilis could be transmitted from an individual to another as a consequence of sexual intercourse. The name *Syphilis* comes from the poem by Fracastoro entitled *syphilis sive morbus gallicus*, which is about a shepherd boy named Syphilis, who by angering the sun god of Haiti, bought upon himself the dreaded infection. The poem also suggests mercury and guaiaco as a treatment for this STI.

On June 15, 1520, Pope Leo X informed *Martin Luther*, that he would be excommunicated from the Catholic Church unless he recanted 41 sentences from his controversial writings, including the *Ninety-Five Theses*, which criticized elements of the Catholic Church and its faith (Donahue 1996; Loades 1990). Despite these threats from the Pope, Luther did not back down from his beliefs and continued to criticize and attack the corruption present in the Catholic Church headed by the Pope. As a result of his continued defiance,

Luther was excommunicated from the church on January 3, 1521. Consequently, a revolt and rebellion swept across the European continent, and these individuals were subsequently called "Lutherans" and "Protestants," meaning those who protested against the corrupt Catholic Church and Pope Leo X. Within a few years, Denmark, Norway, Sweden, and Germany had declared themselves to be Lutheran. Although the Protestant Revolt did not have any major effects on charitable hospitals in countries that remained under Catholic rule, the majority of hospitals run by Catholic religious orders were closed or confiscated by the Protestant rebels. This had significant implications for the sick and the poor who were driven out of these institutions for the sick and poor (Donahue 1996). The most notable chaos that resulted from these reforms and protests against the Catholic Church and the authority of the Pope occurred in England under the rule of *King Henry VIII* (Tudor). King Henry VIII appointed himself the head of the Church of England and confiscated the property of more than 600 Catholic charitable endowments (Donahue 1996; Loades 1990). Consequently, the care received by the sick and poor quickly deteriorated because formally educated and trained nurses in these once Catholic charitable establishments were replaced by untrained lay attendants or uneducated nurses (Bartfay 2010a).



Everett Historical/Shutterstock.com

Photo 2.19 Oil painting of Martin Luther by Lucas Cranach den Ældre. The year 1517 marks the beginning of the *Reformation* or the *Protestant Revolt* against the authority of Pope Leo X and patriarchal rule by the Catholic Church in Europe.

Women in England were recruited from all sources to fill the nursing ranks, which included drunks, social undesirables, and prostitutes. The majority of these were illiterate, rough, and ill-qualified and trained women who were assigned nursing duties in lieu of serving jail sentences. In fact, when a woman in England could no longer earn a living from gambling or prostitution, she might consider becoming a nurse (Donahue 1996). There was little or no organizations in these institutions as a consequence of these dramatic reforms and no one with any credible social standing would consider becoming a nurse. Fortunately, the reputation of nurses in England was revised during the Victorian Era of the 19th century due to reforms instigated by Florence Nightingale and her contemporaries.

During the 16th and 17th centuries, we observe the beginnings of the so-called *mechanistic medical model of health* (Brike and Silvertown 1984; Capra 1982; Lyons and Petrucelli 1978; McKeown 1976). Similar to da Vinci's description, William Harvey (1578–1657) also viewed the human body as a *living biological machine* when he detailed how that heart and circulatory systems correctly functioned. However, this biological machine remained disconnected from one's environment, mind, or spirit (Bartfay 2010a). Indeed, there was an increasing opinion and clinical view that various body components or systems (e.g., neurological, circulatory, and digestive) were interconnected, yet one could diagnosis specific malfunctions and diseases and treat them separately based on the specific body component or system effected. The purpose of medicine was redefined to entail the correct diagnosis and treatment of the defective or malfunctioning component or system of the biological human machine that resulted from disease or illness (Brike and Silvertown 1984; Capra 1982). Thomas Sydenham (1624–1689) argued that this mechanistic medical model of health should be employed for treating clients and the need to develop medical specialist with the appropriate expertise in diagnosing and managing defective body systems or components (e.g., heart, lungs, and digestive system) (Capra 1982; Donahue 1996). This perspective is analogous to the repair of a defective gear in a machine such as a clock, or the replacement of water or an oil pump in a car. Consequently, the mechanistic medical model for health

has resulted in the establishment of a variety of specialized fields in medicine and hospital units or wards that cater to these specific body systems. In fact, we now have specialist for the mind (psychiatrists), the kidneys (nephrologists), digestive system (gastroenterologists), the heart (cardiologists), immune system (immunologists), and our skin (dermatologists), to name but a few.

The adoption of the medical model of health is a critical milestone in the historical evolution of the concept of health because it viewed alterations to one's health as simply defects in some biological component or system that needed repair that could be achieved through medical interventions (e.g., surgery, medications). It is also a critical turning point because it further distinguished and defined health via body components, and the call to develop medical specialist to better diagnosis and treat each of these defective parts or systems. Hence, health from the mechanistic medical model paradigm was based on the notion that an individual was deemed "healthy" provided that they were disease free and that each body system or component was functioning optimally (Armstrong and Armstrong 2001; Birke and Silvertown 1984; Capra 1982; Illich 1975). A **paradigm** is defined as a specific worldview or perspective, way of thinking, and/or methodology, which guides practice in the health sciences (Bartfay and Bartfay 2015). Moreover, the mechanistic medical model paradigm of health remains central to the organization of specialized acute care hospital units (e.g., cardiac, obstetrical, neurological) in Canada and globally (Bartfay and Bartfay 2015).

The medical model of healthcare delivery has also provided a mechanism for institutions such as hospitals in Canada to calculate or determine the amount of work time required for other allied healthcare professionals (e.g., nurses, physiotherapists) and workers (e.g., orderlies, x-ray technicians) on the basis of the specific part being repaired and/or replaced (e.g., heart valve, new knee). In fact, our current publicly funded healthcare systems in Canada have been compared to piecework payments in manufacturing industries, in which workers are paid for each component produced (Armstrong and Armstrong 2003; Armstrong et al. 2001).

In the widely quoted and influential book entitled *The Role of Medicine: Dream, Mirage or Nemesis?* Thomas McKeown (1976) critically examines the validity of the mechanistic medical model of health which is rarely stated explicitly, but which medical activities and directives today continue to be largely dependent on. Specifically, that the concept of health based on the medical model paradigm is essentially derived from a mechanistic approach based on the understanding of the structure and function of human body parts and systems and disease processes that affect them directly.

> Medical services is dominated by the image of the acute hospital where the technological resources are concentrated, and much less attention is given to environmental and behavioural determinants of disease, or to the needs of sick people who are not thought to provide scope for investigation or therapy.
>
> —McKeown 1976, p. 6

The medical model of what health is and how it is to be achieved, promoted, or restored remains the dominant paradigm in Canada and the basis for the Canada Health Act (CHA) passed by Parliament in 1982 (Bartfay 2010a; Bartfay and Bartfay 2015; Government of Canada 1984). In fact, funding transfer payments to the various provinces and territories by the federal government, as detailed in the CHA (1982), is based on "medically necessary" physician services (Bartfay 2010a; Government of Canada 1984). In addition, the medical model paradigm of health was central to the evolution of our Medicare systems and how healthcare continues to be largely funded and delivered in Canada (Frank, Di Ruggiero, and Moloughney 2003; National Expert Commission Canadian Nurses Association 2012). We shall examine the limitations of the medical model of health and examine the need to adopt more holistic models based on primary healthcare models in greater detail below.

Our publicly insured (tax-based) healthcare systems in Canada have been largely conceived on the basis of a medical model of health that is largely delivered in acute care hospitals and are physician driven (Bartfay 2010a; Bartfay and Bartfay 2015). In fact, physicians remain the primary referral agents for access to a variety of healthcare services in Canada. Indeed, physicians may be regarded as "gate keepers" to specific diagnostic procedures and laboratory-based tests, other medical specialists (e.g., cardiologists, neurologists, orthopedic

surgeons), and to various healthcare services (Browne, Birch, and Thabane 2012; National Expert Commission Canadian Nurses Association 2012; Soroka and Mahon 2012). Physicians in many parts of the world and in Canada are still optimally in charge of making diagnoses, administering treatments and cure. Furthermore, the cutbacks in healthcare funding over the past 4 decades have resulted in an increasing focus on quick treatments and cure by politicians and policy makers, thus ensuring that physicians remain at the center of acute care institutions (Armstrong and Armstrong 2003; Bartfay and Bartfay 2015).

> No discussion of "better value" for dollars spent in our publicly funded health-care system can be complete without addressing the question of how we pay care providers . . . an acute, treatment model drives Canada's system, where the physician acts as gatekeeper to specialized diagnostic and treatment-often offered in hospitals. Yet evidence shows that this model is insufficient to meet current and future health and wellness care needs of Canadians.
>
> —National Expert Commission Canadian Nurses Association 2012, p. 28

The reader is referred to Chapter 3 for a detailed discussionrelated to the CHA and the challenges facingour publicly funded healthcare systems based on the medical model of health in the new millennium.

Industrial Revolution Era

The 18th and 19th centuries are characterized by various technological and scientific discoveries, which were often fueled by the causative medical model of health (Bartfay 2010a; Madigan and Martinko 2006). For example, Pasteur discovered how viruses were attenuated, developed an effective treatment for rabies, and discovered the process of pasteurizing milk to kill harmful bacteria along with Claude Bernard. A wide variety of germs that are sometimes present in raw milk can make individuals very ill, including bacteria (e.g., *Brucella*, *Campylobacter*, *Listeria*, *Mycobacterium bovis* [a causative organism of tuberculosis, TB], *Salmonella*, Shiga toxin–producing *Escherichia coli* [e.g., *E. coli* O1570, *Shigella*, *Yersinia*]), parasites (e.g., *Giardia*), and viruses (e.g., norovirus) (British Columbia Centre for Disease Control 2013; Centers for Disease Control and Prevention 2006). Selling unpasteurized milk in Canada has been prohibited under the Food and Drug Regulations Act (section B.08.002[1]) since 1991. In addition, several provinces have similar legislation that prohibits the sale or distribution of

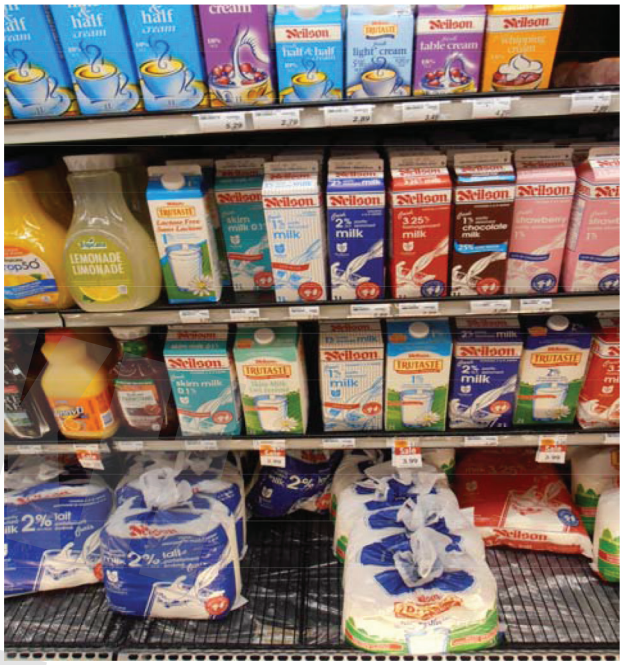
Source: Wally Bartfay

Photo 2.20 Louis Pasteur (1822–1895) brought about a revolution in medicine when he linked tiny microorganisms, which could be seen only under the microscope, with certain communicable diseases and confirmed the germ theory of disease causation. This theory eventually replaced Hippocrates' 2,000-year-old theory of the 4 body humors previously taught to medical students.

raw milk products. For example, Ontario's Health Protection and Promotion Act, subsection 18(1) reads: "No person shall sell, offer for sale, deliver or distribute milk or cream that has not been pasteurized or sterilized in a plant that is licensed under the Milk Act or in a plant outside Ontario that meets the standards for plants licensed under the Milk Act" (Government of Ontario 2011).

Robert Koch (1849–1910) discovered the tubercle bacillus in 1882 as the cause of TB and also the cholera bacillus in 1883. Koch was subsequently awarded the Nobel Prize in Medicine in 1905 for his work. Pasteur and Koch collectively founded the scientific field of bacteriology, which has helped to further establish the dominance of the laboratory-based single-agent causative medical model of health in the 19th and 20th centuries (Madigan and Martinko 2006).

Joseph Lister (1827–1912) revolutionized surgery by decreasing the incidence of post-operative infections through the use of a mild carbolic acid solution sprayed during surgical procedures. Donahue (1996) reports that by the middle of the 19th century, several clinical diagnostic instruments such as the thermometer and stethoscope along with diagnostic tools such as x-rays became important adjuncts to the practice of medicine in North America and Europe. The introduction of ether and chloroform as general anesthetics greatly advanced surgical outcomes and practices. In addition, the science of bacteriology had become the basis of modern medical practice and surgery.



Source: Wally Bartfay

Photo 2.21 Pasteurization of all milk products in Canada is a form of both primordial and primary preventions for public health. In fact, an individual who consumes contaminated raw milk may develop severe or even life-threatening diseases, such as Guillain-Barré syndrome resulting in paralysis and hemolytic uremic syndrome, which can result in kidney damage or failure, stroke, and even death.

The 18th and 19th centuries are also characterized by increased mechanization and the growth and expansion of industry termed the "Industrial Revolution" (Hanlon and Pickett 1984; Swanson and Albrecht 1993). During this period, the health and lives of the poor, including children, were often sacrificed for industrial profit and gains. For example, local parishes in England were often given the responsibility for providing relief for the poor under the so-called *Elizabethan Poor Law* (Swanson and Albrecht 1993). In essence, these were workhouses for the poor which often included orphaned and poor children who were wards of the parish. These children were often required to labor for long hours with limited food and shelter or other comforts of home. Individuals with affluence and status were predominately treated in their own homes by physicians or private duty nurses, whereas the less affluent and poor were cared for in hospitals. Hence, the subsequent deterioration in the condition and reputation of Protestant run hospitals in Europe during this time is undeniable (Bartfay 2010a; Bartfay and Bartfay 2015).

A number of humanitarian leaders, however, emerged to reform these practices and institutions. For example, the English philanthropist *John Howard* (1727–1789) wrote detailed reports on the conditions of various public institutions including hospitals, asylums, and prisons (Donahue 1996; Lyons and Petrucelli 1978). These reports were highly significant in improving the health conditions of these public institutions, including the necessity for fresh air, cleanliness, and compassion for those less fortunate in the 18th century. The following account provides the reader with an example of the deplorable conditions and treatments by Howard:

> One ward is for clients dangerously sick or dying; another for clients of the middle rank of life; and the third for the lower and poorer sort of clients. In the last ward (which is the largest) there are four rows

> of beds; in the others, only two. They were so dirty and offensive as to create the necessity of perfuming them; and yet I observed that the physicians, in going his rounds, was obliged to keep his handkerchief to his face . . . These were served by the most dirty, ragged, unfeeling and unhuman persons I ever saw. I once found eight or nine of them highly entertained with a delirious dying client. The governor told me that they had only twenty-two servants, and that many of them were debtors or criminals, who had fled thither for refuge.
>
> —Howard 1791, pp. 58–60

Similarly, *Elizabeth Gurney Fry* (1780–1845) advocated for improving the health and living conditions of women prisoners in England (Bartfay 2010a). Fry also established a society for visiting nurses first known as the *Society of Protestant Sisters of* Charity in 1840, and which later become known as the *Institute of Nursing Sisters*. These public health nurses provided private home-based nursing services to individuals of all social classes and standings in England (Donahue 1996; Swanson and Albrecht 1993). This is an important historical milestone for our understanding of how various social determinants (e.g., education, poverty, and homelessness) affect health. The reader is referred to Chapter 1 for a detailed description of our current understanding of the SDH. The Research Focus Box 2.1 provides an overview of a mixed-design study, which examined the healthcare needs and resources being accessed in their communities by women who were recently released from a correctional institution.

The Industrial Revolution period is also marked by the scientific study of medicinal plants and herbal remedies for clinical applications. Perhaps, one of the best examples involves the use of the elegant Foxglove

Research Focus Box 2.1

Healthcare needs of women immediately post-incarceration: A mixed methods study

Study Aim/Rationale: The aim of this study is to assess the health status of women who were recently incarcerated in a prison and explore their healthcare needs and resources being accessed immediately following their release.

Methodology/Design

A mixed-methods study design was employed by the researchers, which consisted of a: (i) a quantitative survey in phase I of the investigation, and (ii) qualitative interviewing in phase II. In phase I, data were collected on demographics, health history, health status, and health-promoting behaviors. In the second phase, semi-structured interviews were used. The inclusion criteria included that all participants be at least 18 years of age and had to be released from a prison in the last 12 months. Thirty-four women participated in phase I, and 11 women took part in phase II of the investigation.

Major findings

The results from this investigation showed that women who were recently discharged from a correctional institution had below average health status, in comparison to the general population. The major health issues identified by participants were associated with the lingering effects of being incarcerated, including recovery from substance abuse as a major health concern; mental health issues; routine health promotion and maintenance, and social and environmental barriers to accessing care.

Implications for public health

This study suggests that women discharged from correctional institutions have significant and complex healthcare needs. This period of transition appears to be an opportune time to offer support, services, and other health-promoting interventions by public healthcare professionals and workers.

Source: Colbert et al. (2003).

plant (aka Lady's Glove, Virgin's Glove) or *Digitalis purpurea* in Latin for the treatment of dropsy, a symptom of congestive heart failure (Aikman 1977; Grieve 1931; Weiner 1980).

Withering devoted 10 years to investigating the medicinal properties of this plant and the noted clinical outcomes for each of the 163 clients that he treated. He also worked out the safe dosage range for prescribing this herbal remedy to his clients (i.e., 1–3 g of the powdered green leaves twice daily) that he knew to be highly dangerous and sometime lethal in higher dosages. He published his findings in his classic treatise, *An Account of the Foxglove and Some of its Medical Uses*. Foxglove contains a glycoside that has been used as a stimulant in acute circulatory failure, as a diuretic, and as a cardiac tonic in chronic heart disorders for over 200 years now (Aikman 1977; Grieve 1931; Weiner 1980). It has been estimated that over 400 different kinds of cardio-active glycosides have already been isolated from the plant kingdom alone.

Public Health Activities in Canada: 1900–1950

Public health activities in Canada during the early part of the 20th century continued to be largely uncoordinated and unorganized in nature, and were mostly in response to infectious outbreaks (PHAC 2008a; Rutty and Sullivan 2010). For example, the City of Toronto was the first to hire a civic nurse in 1907 to provide public health services including health education in the home of individuals diagnosed with TB (Bartfay 2010b; Royce 198; Rutty and Sullivan 2010). Subsequently, the City of Montréal hired a nurse from the Victorian Order of Nurses to provide health education for individuals infected with TB (Gibbon 1947).

Public health activities also increased in response to Canadian soldiers who were returning from the First World War (1914–1918), and who were exposed to the Spanish influenza pandemic of 1918–1919 (PHAC 2008a; Quinlan and Dickinson 2009). Once former Canadian soldiers were at home, the Spanish flu virus quickly spread across Canadian cities, and even affected remote and isolated communities. The Spanish flu pandemic killed an estimated 50 to 100 million individuals worldwide, including approximately 50,000 Canadians.

The Canadian Public Health Association (CPHA), which was first a voluntary association composed of concerned medical and other allied healthcare professionals, held their first meeting on October 12, 1910, in Ottawa to discuss public health concerns that were affecting communities across Canada (Rutty and Sullivan 2010). The CPHA held its first annual conference in December, 1911, at McGill University in Montréal. The importance of this voluntary association in addressing public health concerns is evidenced by the fact that the Prime Minister of Canada, the Governor General, and the Premier of Québec were all in attendance. One of the major agenda items of this conference was to develop a comprehensive public health plan for the prevention, control, and eradication of TB. The CPHA also played a major role in advocating for the creation of the Department of Health in 1919 (PHAC 2008a). This department retained functions related to quarantine and food and drug standards, but its role was expanded to include the promotion of child welfare and the implementation of public health campaigns against STI and TB. During this time period, cities such as Toronto and Montréal began to pasteurize milk against bovine TB, and towns such as Peterborough began using chlorination to disinfect their public drinking water supplies (PHAC 2008a).

Additional public health developments during the early part of the 20th century in Canada included school-based immunization programs against smallpox and diphtheria, and the appointment of nurses by school boards to monitor the health and wellness of children. The first public health nurses in Canada were appointed in 1909 in Hamilton and 1910 in Toronto (Bartfay 2010b; Ross-Kerr 2003). *Lina Roger*s (Struthers—married name) who was appointed to the School Nursing Service of the Toronto Board of Education, achieved international recognition for her work correlating the absence of children from school with a lack of healthcare (Gibbon and Mathewson 1947). Rogers wrote the first textbook for school nurses in 1917 entitled *The School Nurse: A Survey of the Duties and Responsibilities of the Nurse in Maintenance of Health and Physical Perfection and the Prevention of Disease among School Children*. Rogers and her assistant often had to improvise when administering nursing care to students in schools. For example, radiators and window sills often served as dressing tables to address wounds (e.g., from rat bites), and a discarded high chair doubled as a treatment table for treating eye infections (e.g., conjunctivitis). They also identified children with disabilities

(e.g., vision or hearing problems) that made learning a challenge for them in the classroom. A contagious condition such as TB would still cause a student's dismissal from the classroom, but Rogers and her assistant followed-up with family visits and used the time to teach about hygiene and prevention to parents and guardians. Comprehensive school-based primary health programs and initiatives delivered in communities remains an internationally recognized framework that supports improvements in both educational and health outcomes in a planned, integrated, and holistic fashion (Murray et al. 2007; National Expert Commission Canadian Nurses Association 2012; Stewart-Brown 2006).

Following the First World War, the Canadian Red Cross Society was fundamental in establishing 1-year post-graduate certificate in public health nursing programs offered at various universities across Canada (Canadian Red Cross Society 1962). These programs were available at the University of British Columbia, University of Western Ontario, University of Toronto, McGill University, and Dalhousie University (Bartfay 2010b). These public health nurses received training in both disease prevention and the delivery of home-based healthcare services to a variety of individuals across the life span affected with illness or disease. In 1927, the School of Hygiene at the University of Toronto was also founded to provide post-graduate training for a range of public health professionals. It is notable how instrumental voluntary organizations, such as the Canadian Red Cross Society and the CPHA, have been in shaping the current public health fabric in Canada (Bartfay 2010b; Bartfay and Bartfay 2015).

The health of Canadians was dealt a serious blow during the Great Depression of the 1930s that resulted in the collapse of many industries in cities and towns, and several farmer's and individuals lost their homes and livelihoods (PHAC 2008a). The Great Depression was subsequently followed by the Second World War (1939–1945). Infectious diseases, such as polio, remained as a serious threat to the health and well-being of Canadians. Following World War II, public health services remained minimal in smaller towns and communities, and the majority of the Medical Officers of Health (MOHs) in larger urban centers often lacked formal training in public health and worked on a part-time basis only (Rutty and Sullivan 2010).

In 1939, Ian MacKenzie, the Minister for the Department of Pensions and National Health, wrote a letter to Prime Minister King urging that unemployment and health insurance can be introduced as a war measures initiative along with the need to develop a national healthcare system for all returning soldiers and sailors (Taylor 1987). MacKenzie's arguments were strengthened by the fact that several allied countries (e.g., England, Australia) were already developing these programs. He subsequently hired Dr. J. J. Heagerty as the Director of Public Health Services to formally develop a proposal for health insurance (Storch 2006; Taylor 1987, 1973). Dr. Heagerty strategically consulted with his provincial counterparts and established the Inter-Departmental Advisory Committee on Health Insurance. During the same period, Leonard Marsh was serving as a consultant to the federal government and was involved with the Committee on Postwar Reconstruction in 1944–1945. Marsh's tabled a report entitled *Report on Social Security for Canada* in which he outlined the need to develop a post-war welfare state in Canada (Storch 2006; Taylor 1987, 1973). The work of Heagerty and Marsh reflected national post-war idealisms, and subsequently served as blueprints for the development of various health and social insurance programs in Canada (Bartfay 2010c; Bartfay and Bartfay 2015). Furthermore, these reports planted the seed in Canadian society and idealism that the concept of health was much more than the absence of disease, but was also influenced by a variety of environmental and SDH.

Following World War II, Canada prospered as a nation and the general health and well-being of our citizens and residents improved. The post-war economic boom resulted in new jobs and increasing affluence for Canadian families. By 1950, mortality rates decreased by one-quarter in comparison to those of 1921 (9 per 1,000 compared with 12 per 1,000) (PHAC 2008a). It is noteworthy that employment remains a critical social determinant of health in Canada and globally. A variety of national and social programs were also introduced, including the *Canada Pension Plan* (CPP) and the *Old Age Security* (OAS) plan, which positively affected the health and well-being of seniors.

In 1948, the Government of Canada established the *National Health Grants Program* which served as a major stimulus for the development of basic public health infrastructures and programs in the provinces over the next 3 decades (PHAC 2008a). The program consisted of grants-in-aid to the provinces for general public

health initiatives including the formulation of provincial health plans, TB control, mental health, cancer control, child and maternal health, and the training of healthcare professionals (e.g., physicians and nurses). Access to acute care hospital services were also guaranteed through the introduction of legislation including the Hospital Insurance and Diagnostic Services Act (1957) and the Medical Care Act (MCA 1966) (Falk-Rafael and Coffey 2005; Government of Canada 2002; Rachlis and Kushner 1994).

It is noteworthy that these funding schemes were based on an episodic acute care medical model of health dominated and driven by physicians for the past 50 years (Browne et al. 2012; National Expert Commission Canadian Nurses Association 2012; Soroka and Mahon 2012). Based on this model, physicians acted as "gate keepers" for referrals and access to various diagnostic and laboratory-based tests (e.g., x-rays, blood tests, electrocardiograms), were responsible for writing all prescriptions filled by pharmacists, made referrals to access the services of other medical specialists (e.g., cardiologists, neurologists, and orthopedic surgeons), and ordered and directed specialized care performed by other healthcare professionals or workers (e.g., wound dressing changes performed by nurses, specific exercises performed by physiotherapists after a stroke). The 1964 Royal Commission on Health Services recommended:

> That as a nation, we now take the necessary legislative, organizational and financial decisions to make all the fruits of health sciences available to all our residents without hindrance of any kind—there can be no greater challenge to a free society of free men.
>
> —PHAC (2008a)

It was not until the early part of the current century that we observe acute care hospitals evolving into the more familiar highly specialized sites for treating clients across the various social classes. This was largely due to the high cost of medical diagnostic equipment and technologies (e.g., x-rays, diagnostic laboratory-based blood tests). Indeed, the average physician could not afford these newly discovered diagnostic and treatment technologies for their individual private offices (Storch 2006). By 1955 there were 1,216 hospitals in Canada (Armstrong and Armstrong 2003). Hence, hospitals became the logical site for physicians and other healthcare professionals to access these new technological tools of their trade developed as a consequence of the laboratory-based medical model of health.

It is notable that prior to World War II, the majority of nurses in Canada (approximately 60%) worked as public health nurses or were self-employed in private homes (Baumgart and Wheeler 1992; Canadian Nurses Association [CNA] 1996). Similarly, Coburn (1988) reports that during the 1930s, only 25% of all nurses worked in hospitals. This number increased to over 65% by the early 1950s, and by the year 1989, approximately 85% were of all nurses in Canada were practicing in publicly insured hospitals (Canadian Institute for Health Information [CIHI] 2006). Add to your knowledge of the history of nursing and how the profession has contributed to reforming our current understanding and definitions of health by accessing the Web-based Resource Box 2.1.

Challenges to this unicausal laboratory-based medical approach to achieving health included the 19th century German physician and hygienist Max von Pettenkofer (Swanson and Albrecht 1993). Von Pettenkofer boldly challenged his contemporaries and the dominate unicausal germ theory of disease origin by swallowing a large quantity of the *cholera bacillus* in front of his students. Hence, he directly challenged the validity of this unicausal model of disease by not contracting cholera or dying as a consequence of his radical experiment (Hume 1927).

Figure 2.3 provides the reader with a conceptual diagram of the unicausal laboratory-based medical model of health (Bartfay and Bartfay 2015). Based on this perspective, once the exact cause of the disease is discovered in the laboratory, unique cures (e.g., antiviral agent, antibiotic, gene therapy) can be developed to produce or restore optimal health. Ironically, corporate-based fundraising efforts (e.g., CIBC's or Sear's run for the cure for cancer) in Canada continue to socially reinforce the dominance of this unicausal medical model of health in our society via the emphasis and preferential funding for laboratory-based research programs

Web-based Resource Box 2.1 History of Nursing and Definitions of Health

Learning Resource	Website
AMS Nursing History Research Unit This website provides various historical facts and links to vital resources related to historical developments, legislations, and practice mandates for nurses in America and abroad.	http://www.health.uottawa.ca/nursinghistory
BCE History of Nursing Group This website concentrates on the history of nursing in British Columbia, but also provides historical facts and data from other Canadian-based resources related to nursing.	http://www.bcnursinghistory.ca
Canadian Association for the History of Nursing This website provides access to historical developments in the profession of nursing from both Canadian and international perspectives and influences.	http://www.cahn-achn.ca
This is Public Health Mini-lecture Series—Lecture 5: Understanding the Concept of "Health": It's Evolution and Definitions. By Wally J. Bartfay (2018). This mini-lecture explores the concept of health, how we have defined health from a historical context, and our understanding of this concept based on the current best available evidence.	https://www.youtube.com/watch?v=l_K0VaHy06A&index=1&list=UU1JpTVSozqQgpbMExe1txqQ

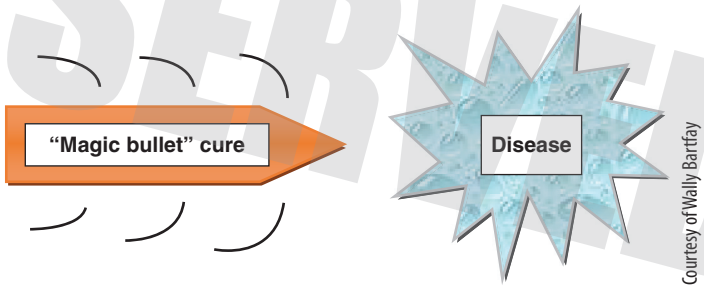


Figure 2.3 Conceptual Diagram Showing the Unicausal Model of Disease Origin and Cure. The continued predominate directive of medical research for finding the specific causes and cures of disease, or so-called "magic bullet" cure approach, has remained an enduring consequence of the unicausal laboratory-based medical model of health.

and grants to find the causes and associated cures for various diseases (Bartfay and Bartfay 2015). One of the major limitations of the unicausal medical model paradigm of health is that it fails to consider complex environmental interactions or multifactorial determinants of health that can lead to negative health outcomes. For example, there is no "magic bullet" cure (e.g., antiviral agent, antibiotic, gene therapy) for children who live in poverty, are physically and psychologically abused, and suffer from malnutrition. Similarly, there is no "magic bullet" cure for an adult with type 2 diabetes who is morbid obese, smokes a pack of cigarettes daily, leads a sedentary lifestyle, and makes poor dietary choices (Bartfay and Bartfay 2015).

In his widely quoted work entitled *Medical Nemesis: The Expropriation of Health*, Ivan Illich (1975) argues that the medicalization of health is a monopoly that has only served their interest of physicians since the turn of the century. Nonetheless, the concept of *medicalization* was first introduced by Zola (1972) who defined it as a social process whereby various psychosocial aspects of human daily life are progressively and deliberately understood in terms of health and illness.

For example, homosexuality was historically regarded as a social deviance that was consequently defined and categorized via medical terms and clinical standards at the turn of the present century, which in-turn required diagnosis and treatment by physicians (Conrad and Schneider 1985). Specifically the influential American Psychiatric Association (APA) first listed homosexuality in the *Diagnostic and Statistical Manual* (*DSM-I*) as a sociopathic personality disturbance in 1952 (McCommon 2006; Spitzer 1981). It is notable that the *DSM* (version V now) has been translated into various languages and continues to be the "gold standard" for making diagnosis by psychiatrists and clinical psychologists. In 1968, the *DSM II* removed homosexuality from the sociopathic list and re-categorized it with other sexual deviations. It was finally removed and de-categorized as a sexual deviation from the *DSM* in 1973 (McCommon 2006; Spitzer 1981). Hence, it has been argued that the practice of medicine was seen as a means of social control and dominance for homosexuals in North America and abroad (Conrad and Schneider 1985; Illich 1975).

Currently in Canada, homosexuality is not regarded as a "disease" per se requiring diagnosis and treatment by physicians, but a sexual preference and lifestyle choice (Bartfay and Bartfay 2015). Nonetheless, the international gay, lesbian, and bisexual communities continue to face discrimination in many parts of the world based on the criminalization of homosexuality as a continued means of social control by politicians and policy makers. For example, the Russian Parliament under the leadership of President Vladimir Putin has passed a law in 2013 criminalizing the "propaganda of non-traditional sexual relations" (Kordunsky 2013). Homosexuality also remains criminalized in 76 countries around the world including Afghanistan, 38 states in sub-Saharan Africa, Barbados, Belize, Burundi, Cameron, Egypt, Iran, Jamaica, Lebanon, Malaysia, Mauritania, Morocco, Papua New Guinea, Tonga, Trinidad, Shi Lanka, United Arab Emirates, Qatar, and Yemen, to name but a few (Bay Windows 2010; Kordunsky 2013; Saner 2013). Moreover, there are several countries with the death penalty associated with homosexuality including Iran, Saudi Arabia, Sudan, Yemen, Nigeria, and Somalia.

McKeown (1976) argues that the predominant influences that have resulted in improvements in health during the past 3 centuries were not linked to the practice of medicine per se, but attributed to improvements in diet and nutrition (e.g., food safety), the environment (e.g., safe water supplies, sewage disposal), behavioral changes (e.g., smoking cessation, exercise), and reproductive practices that limited population growth. McKeown (1981) further disputes the validity and true impact of the unicausal germ theory of disease causation for improving the overall health of individuals and communities. For example, although Koch identified the *tubercle bacillus* as the cause of TB in 1882, no effective treatments were available until the antibiotic streptomycin was discovered 65 years later in 1947. However, by the time this antibiotic agent was discovered, mortality rates were only a fraction of what they were during the 19th century. Hence, improved survival rates and decreased mortality rates could not be linked directly to the discovery of streptomycin and its ability to rid clients of the *tubercle bacillus*, but were in fact largely attributed due to improvements in public sanitation, improved nutritional status of individuals, improved living conditions, and other SDH (Bartfay 2010a; McKeown 1981; Rutty and Sullivan 2010).

Interestingly, the 1842 British report entitled *The Sanitary Conditions of the Labouring Population of Great Britain* concluded that clean drinking water, sewers, and adequate housing for their residents were essential to prevent the spread of infectious diseases (PHAC 2008a). This report led to the establishment of the first Public Health Act in the United Kingdom in 1848. Similarly, the 1900 *Annual Report of the Provincial Board of Health for Ontario* concluded that there has been a remarkable decline in mortality associated with communicable diseases by the turn of the century, which were largely attributed to improvements in drinking water quality, sanitation measures put in place, and public infrastructures such as proper sewers (PHAC 2008a).

Similarly, Naidoo and Wills (2000) argue that the overall contributions of mechanistic medical model of health for reducing mortality globally has been minor, in comparison with those related to improvements

made to environmental conditions such as clean drinking water supplies, proper sanitation, adequate nutrition, and housing. In fact, it is estimated that approximately 75% of "good health" maintained or achieved is the result of factors (e.g., lifestyle choices, clean water supplies, proper sanitation, legislations such as the mandatory pasteurization of milk in Canada) that are beyond direct episodic acute care that is often delivered in hospitals (National Expert Commission Canadian Nurses Association 2012; Standing Senate Committee on Social Affairs, Science and Technology, Subcommittee on Population Health 2009). These health factors and determinants are critical to highlight in terms of our current understanding and definitions of health and how it is achieved, maintained, restored, and promoted across the life span.

Add to your knowledge of the history of medicine and the development of the mechanistic medical model of health by accessing the Web-based Resource Box 2.2.

Web-based Resource Box 2.2 History of Medicine and the Development of the Mechanistic Model of Health

Learning Resource	Website
Canadian Society for the History of Medicine (CSHM) This website promotes the history of health and medicine in all its facets from a multi-disciplinary perspective.	http://cshm-schm.ca/
History learning site—History of Medicine This website provides an overview of major historical developments in the evolution of medical practice and other major developments in medicine including the germ theory.	http://www.historylearningsite.co.uk
International Society for the History of Medicine (ISHO) This international society provides the dissemination of historical facts, timelines, and research related to the history of medicine and surgery from an international perspective.	http://www.uia.be/s/or/en/1100042324

The Emergence of Holistic Definitions of Health

1950s to Present

The post–World War I and World War II era of healthcare in Canada and abroad continued to be dominated by the mechanistic medical model of health, with the emphasis on diagnosis, treatment, and cure of communicable (infectious) disease, as opposed to consideration for complex and compounded multiple health conditions, chronic diseases, or disabilities (Bartfay and Bartfay 2015). The Government of Canada appointed Justice Emmett Hall in 1965 to chair a Royal Commission on Health Services (Bartfay 2010c). The mandate of this Royal Commission was to carefully examine the existing public healthcare systems in Canada and report on their overall effectiveness (Hall 1980).

The CNA (1980) responded to the Hall's Commission request for input by healthcare professionals with its influential document entitled *Putting Health Back into Health Care*. This document made several critical recommendations, including that (i) existing hospital and medical insurance programs be revised to stimulate the development of primary healthcare services in Canada; (ii) improve preventive, diagnostic, and ambulatory community-based points of entry into the healthcare systems; (iii) qualified healthcare professionals and workers be better utilized by the public healthcare system, and (iv) changes to provincial legislation be revised to allow qualified nurses and other healthcare professionals to undertake health services currently only performed by physicians (CNA 1980).

The Hall Commission served as an impetus for a series of discussions between the Government of Canada and the provincial and territorial governments regarding the need for a national publicly insured healthcare system. Consequently, the MCA (1966) was passed by Parliament in 1966 with support by all major federal political parties, and implemented in 1968 (Bartfay 2010c). Hence, the publicly funded national Medicare system that we know today was effectively created with the passage of the MCA. In 1972, our national publicly funded Medicare program was finally instituted when all provinces and territories agreed to enlist with the plan. Nonetheless, this national Medicare program was directly primarily toward acute care hospital and physician-driven healthcare services, despite lobbying efforts by the CNA and other healthcare professionals (Bartfay 2010c; Bartfay and Bartfay 2015). Currently, each province and territory in Canada is responsible for delivering its own public healthcare system, with independently negotiated health transfer funds from the federal government to help to cover the associated costs. The fee-for-service acute care model driven by physicians who act as gatekeepers to various diagnostic and healthcare services continues to dominate our current publicly funded healthcare systems in Canada (Browne, Birch, and Thabane 2012; Soroka and Mahon 2012).

> We know that while this model suited doctors and most Canadians when Medicare was first introduced, times have changed. That model—delivered so often in and around hospitals—is very costly, and ultimately inefficient, way to meet the needs of Canadians now. This is one reason why we propose the funding of an integrated primary health-care model and urge governments to undertake the work needed to do this.
>
> —National Expert Commission Canadian Nurses Foundation 2012, p. 29

The Lalonde Report, 1974

By the mid-1970s, a renewed interest in primary healthcare and health promotion had occurred almost simultaneously in several industrialized western countries including Canada, the United States, Great Britain, Germany, France, and Australia (Green and Ottoson 1994). In 1974, Marc Lalonde, the Federal Minister of Health, was the first to acknowledge the fact that our publicly insured healthcare systems in Canada were dominated by the outdated medical model of health (Bartfay 2010c). Lalonde was the first Minister of Health to also view the concept of health as resource that is influenced by a broad range of factors, rather than by only biological processes in his document entitled N*ew Perspective on the Health of Canadians*, which is informally known as the *Lalonde Report* (Lalonde 1974). Moreover, this landmark document is considered as the first report by a major industrialized nation to formally acknowledge that health is determined by more than just biological factors, but also other determinants of health based. This is a critical milestone in our understanding of the concept of health and its definition because it was the first official document by a developed nation in the world to recognize the link between health and a variety of SDH based on the best available scientific evidence to date from a variety of disciplines.

Hence, the Lalonde Report (1974) challenged the unicausal medical model of health and illness by introducing 4 critical determinants that were evidence-informed and shown to be associated with influencing the health of Canadians across the life span:

1. *Human biology*—Composed of both physical and mental elements.
2. *Environment*—Composed of all elements related to health that are regarded as external to one's body.
3. *Lifestyle*—Composed of elements that an individual had control over, such as self-imposed behaviors.
4. *Healthcare organization*—Consists of access to healthcare services by all residents within a given community.

The Lalonde Report (1974) recommended that all levels of government should be actively involved in health promotion and be responsible for any associated increase in costs associated with the delivery of healthcare services to their citizens and residents across the life span. Health promotion activities enhance and/or

reinforce the ability of an individual, family or group, community, or entire population's capacity to promote, maintain, or restore their health and wellness (Raphael 2010; Rootman et al. 2012). Lalonde (1974) argued that the individual's lifestyle choices and behaviors (e.g., smoking, inactivity, and impaired driving) had direct consequences on health, and that various levels of government and community organizations should work collaboratively to promote healthy lifestyle choices, along with the need to conduct ongoing research to validate health outcomes achieved. For example, for every $1.00 invested toward tobacco prevention programs in Canada results in a healthcare saving of $20.00, or a return on investment (ROI) of 1,900%. The concept of health promotion currently includes a synthesis of 5 levels of prevention: (i) primordial, (ii) primary, (iii) secondary, (iv) tertiary, and (v) quaternary (British Columbia Ministry of Health 2013; National Public Health Partnership 2006; Porta 2008; Public Action Support Team 2011). The reader is referred to Chapter 1 for a detailed description of the 5 levels of prevention and examples of each (Figure 2.4).

Shortly after the release of this report, a population-based approach to health promotion and healthcare was gradually introduced to all levels of government in Canada (Rootman et al. 2012; Thompson 2010). According to the PHAC (2007), health promotion in Canada is perceived as a process that permits individuals to increase control over, maintain, and/or improve their health. This process of health promotion embraces actions directed at strengthening the skills and capabilities of individuals across the life span. It also includes actions directed toward changing and improving social, environmental, political, and economic conditions so as to positively advance their impact on public and individual health (PHAC 2007). Add to your knowledge of the Lalonde Report (1974) by accessing the Web-based Resource Box 2.3.

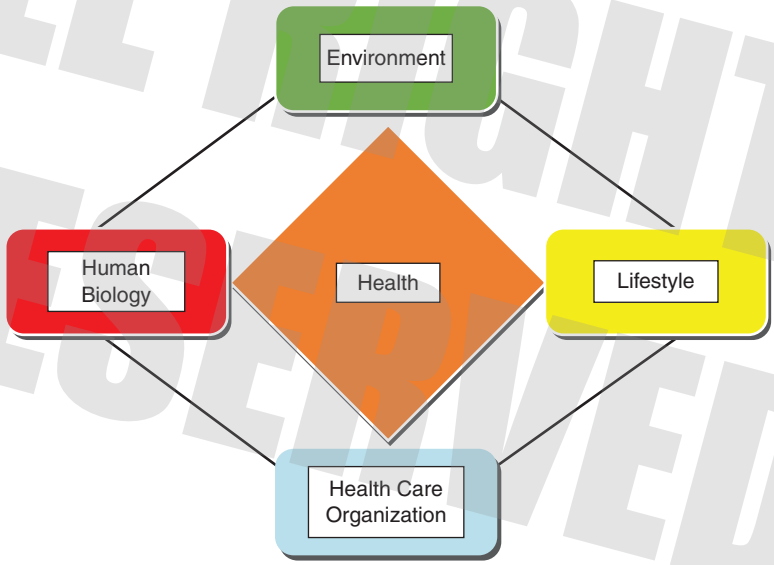


Figure 2.4 Conceptual Diagram Showing the 4 Critical Determinant of Health as Outlined by the Lalonde Report (1974). The Lalonde Report (1974) was the first evidence-informed report by a developed nation to challenge the mechanistic medical model of health by introducing 4 critical determinants of health.

Source: Adapted from Lalonde (1974).

Web-based Resource Box 2.3 The Lalonde Report

Learning Resource	Website
Lalonde (1974) This document is empirically based and highlights how our understanding of the concept of health has evolved based on critical determinants of health over the life span.	http://www.hc.sc.gc.ca/hcs-sss/com/fed/Lalonde-eng.php

In 1969, a study by the *National Advisory Council for Fitness and Amateur Sport* found that the majority of Canadians were sedentary in nature, unfit and alarmingly uninterested in the health benefits associated with exercise (ParticPATION 1969; Rutty and Sullivan 2010). As a result of this study, a federally-funded national public health initiative aptly coined "ParticiPACTION" was launched in 1971 to promote active and healthy lifestyles with the objective of preventing health problems and chronic disease associated with inactivity (Thompson 2010; Rutty and Sullivan 2010). Federal cutbacks resulted in the shutdown of this national public health promotion campaign in 2001. The program was re-instigated in February 2007 due to alarming reports that over half of the Canadians were overweight or obese and sedentary in nature.

Alma-Ata Conference, 1978

The Lalonde Report's (1974) new definition of health and emphasis on health promotion was embraced by many nations around the world and the WHO, which now viewed embraced the importance of health promotion to preserve and promote the health of their citizens (Bartfay and Bartfay 2015). Hence, the Lalonde Report (1974) was viewed as a futuristic and groundbreaking evidence-informed document by many nations around the world (Bartfay 2010a; Thompson 2010). In September 1978, the WHO convened the Alma-Ata Conference on Primary Health Care in Kazakhstan (located in the former Soviet Union) to address the need for global cooperation on a variety of health-related issues and healthcare reforms. The adapted motto for this international conference was *Health for all by the Year 2000*, which emphasized the desire to reduce global inequities in health through the adoption of primary care initiatives (WHO 1978).

It is noteworthy that the Lalonde Report (1974) was the driving force behind the signing of the Declaration of Alma-Ata by 134 nations at this international conference on primary health (Bartfay 2010a). This Declaration urged governments globally to take immediate action to protect and promote the health of all individuals across the life span. In fact, primary healthcare was seen as the major vehicle for reforming the mechanistic medical model of health that dominated healthcare systems globally (Ottoson and Green 1999). Add to your knowledge of the Declaration of Alma-Ata and its significance in the evolution of the definition of health from the laboratory-based mechanistic medical model of health to more holistic definitions of health based on various determinants of health derived from the best available evidence to date in the Web-based Resource Box 2.4.

The Epp Report, 1986

The national public health document entitled *Achieving Health for All: A Framework for Health Promotion* was released in 1986 by the Federal Minister of Health, Jake Epp, and is informally known as the *Epp Report* (Epp 1986). The Epp Framework (1986) was based largely on the Lalonde Report (1974), but expanded on his definition of health promotion by including a wide range of sociopolitical and environmental determinants of health (Bartfay 2010a; Mikkonen and Raphael 2010; Muntaner et al. 2012). The report focused on the following 3 key areas and stated that governments needed to be more active in providing support to groups and agencies within the community to engage in health promotion activities (Thompson 2010):

Web-based Resource Box 2.4 Alma-Ata Declaration on Health

Learning Resource	Website
Declaration of Alma-Ata: International Conference on Primary Health Care, Alma-Ata, USSR, September 6-12, 1978 (WHO 1978). This website highlights the Alma-Ata Conference 10-point declaration on primary healthcare.	http://www.who.int/publications/almaata_declaration_en.pdf

1. Survey the health status of disadvantaged groups and reduce inequities by enhancing the ability of individuals to cope.
2. Enhance detection and the management of chronic disease in Canada.
3. Identify diseases that were largely preventable in nature, and focus on the prevention of these diseases.

The Epp Report (1986) argued that primary healthcare initiatives must be supported at a variety of levels and stakeholders including various levels of government, local groups, and employers. The report also cautioned against the limitations of focusing only on individual lifestyle choices or risk factors associated with the development of chronic disease in Canadian populations (e.g., link between smoking and heart disease, or lung cancer). This report was the first to caution against blaming the victim and criticizing lifestyle risk factor strategies that focused solely on individuals (e.g., smoking cessation programs) without consideration for additional broad determinants of health (Bartfay 2010a). Add to your knowledge of the *Epp Framework for Health Promotion* by accessing the Web-based Resource Box 2.5.

Ottawa Charter for Health Promotion, 1986

The Epp Framework (1986) was released in November 1986 at First International Conference on Health Promotion by the WHO held in Ottawa, Ontario (CPHA, Welfare Canada and WHO 2006; PHAC 2001a). This international WHO conference was convened to review and expand on the proposals put forward at the Alma-Ata conference and to determine the progress that has been achieved to date in meeting these global objectives. At the conference, both Lalonde's (1974) and Epp's (1986) definitions of health were embraced and broadened to include a variety of health prerequisites including peace, education, a stable ecosystem, sustainable resources, shelter, food, income and employment, and social justice and equity (CPHA, Welfare Canada and WHO 2006; PHAC 2001a). The Ottawa Charter outlined 5 broad strategies for global health promotion (Raphael 2010; Rootman et al. 2012):

1. Build healthy public policies;
2. Create supportive environments;
3. Strengthen community actions;
4. Develop personal skills, and
5. Re-orientate health services. Add to your knowledge of the Ottawa Charter for Health Promotion (1986) by accessing the Web-based Resource Box 2.6.

The 1986 WHO international conference was also instrumental in reinforcing the idea that the medical model of health, and the delivery of healthcare services based on this model, were inadequate to currently address the health challenges facing diverse populations across the life span globally. An alternative view to

Web-based Resource Box 2.5 The Epp Framework for Health Promotion

Learning Resource	Website
Epp (1986)	http://www.frcentre.net/library/AchievingHealthForAll.pdf

Web-based Resource Box 2.6 Ottawa Charter for Health Promotion

Learning Resource	Website
PHAC (2001a)	http://www.phac-aspc.gc.ca/ph-sp/docs/charter-chartre/pdf/charter.pdf or http://www.who.int/hpr/NPH/docs/ottawa_charter_hp.pdf

the mechanistic medical model of health is termed the "holistic view" (Naidoo and Wills 2000; Edelman and Mandle 1994). Health from this perspective directly challenges the laboratory-based mechanistic medical model, which asserts that alterations to health results from a biological breakdown of a component of the human body that result from disease (Bartfay and Bartfay 2015). Although there are numerous definitions of health based on this holistic perspective, one of the first global definitions advanced was by the WHO which defined this concept as "a state of complete physical, mental, and social well-being, not merely the absence of disease and infirmity" (WHO 1948, p. 100). In 1986, at the Ottawa Conference, WHO revised this definition by incorporating a socio-ecological component that recognized the inextricable links between the individual and their environment. Accordingly, the definition of **health** was revised to include:

> . . . the ability to identify and to realize aspirations, to satisfy needs, and to change or cope with the environment. Health is therefore a resource for everyday life, not the objective of living. Health is a positive concept emphasizing social and personal resources, as well as physical capacities.
>
> —Canadian Public Health Association, and WHO 1986, p. 426

The holistic view of health identifies the relationship between an individual's internal and external environments, and that health is an asset, human resource, and basic human right. Although this revised holistic definition has been criticized for being too broad, for concentrating too much on a condition of health rather than a process, and for being impossible to achieve by many, it nevertheless has become the most widely quoted definition of health globally (Bartfay 2010a; Bartfay and Bartfay 2015).

Variations of the abovementioned definition of health by WHO have now been adopted by all the provincial and territorial ministries of health in Canada. Indeed, there appears to be a general consensus on what determines a state of health and well-being in Canada, as evidenced by the consensus statement reached at the *National Forum on Health* in 1997:

> We have known for some time that the better off people are in terms of income, social status, social networks, sense of control over their lives, self-esteem and education, the healthier they are likely to be . . . We know that there is a gradient in health status, with health improving at each step up the slope of income, education and social status.
>
> —National Forum on Health 1997, p. 15

The Jakarta Declaration (1997)

In July of 1997, a conference on the need to strengthen global health promotion efforts was held in Jakarta, Indonesia (Shah 2003; Naidoo and Wills 2000). This conference entitled *New Era*: *Leading Health Promotion into the 21st Century in Jakarta* advanced the notion that various prerequisites for health were required including peace, shelter, education, social security, relations, income, nutrition, sustainable resources, ecosystems, social justice, and respect for human rights including equality and the empowerment of women (WHO 1997). The Jakarta Declaration extended on the major strategic areas for health promotion first described in the Ottawa Charter (1986) by identifying the following 5 global health priority areas:

1. Promote social responsibility for health, including policies and practices that protect the environment, resources, and individuals from harm or degradation.
2. Increase investments for health development and equality, especially for children, the elderly, Aboriginal peoples, and marginalized populations.
3. Strengthen existing partnerships and explore the potential for new partnerships between various sectors, levels of government, and society at large.

4. Increase community capacity and empowerment of the individual.
5. Securement of infrastructures for health promotion, which include government organization, educational institutions, and the private sector (WHO 1997).

The Jakarta Declaration recognized that infectious diseases and mental health were 2 areas that required urgent global attention and prompt responses. The Declaration also acknowledged for the first time that various socioeconomic and environmental factors also have major impacts on the health and well-being of citizens globally (WHO 1997). Transitional factors, such as the integration of the global economy, the stability of financial markets and trade, and access to mass and social medias, and communication technologies also have significant impact on health, as does environmental degradation due to the irresponsible use of natural resources (Shah 2003). Advocating, mediating, and enabling were identified as major strategies for engaging in health promotion.

Bangkok Charter for Health Promotion in a Globalized World (2005)

The *Bangkok Charter for Health Promotion in a Globalized World* is an international agreement reached among participants at the sixth Global Conference on Health Promotion held in Bangkok, Thailand, in August 2005 (de Leeuw, Cho Tang, and Beaglehole 2007; WHO 2013). The global health promotion charter acknowledges the health inequalities between developed and developing nations; changing trend of communication including the Internet and consumption in a globalized world; the growth of urbanization in developing regions of the world, global environmental changes (e.g., global warming, severe weather); and increased global trade and commercialization. The following 5 key areas of action for a healthier world are highlighted in the Charter (WHO 2013):

1. **Partner and build alliances** with private, non-private, non-governmental, or international organizations to create sustainable actions.
2. **Invest in sustainable policies**, actions, and infrastructure to address the determinants of health.
3. **Build capacity for policy development**, health promotion practice, and health literacy.
4. **Regulate and legislate** to ensure a high level of protection from harm and enable equal opportunity for health and well-being.
5. **Advocate health** based on human rights and solidarity.

The Bangkok Charter provides a critical link between foreign policies and the global practices related to health promotion and provides leadership and targeted areas for health promotion on an international scale. Moreover, the Charter identifies specific actions, commitments, and pledges required to address the determinants of health in a globalized world through health promotion efforts. The reader is referred to Chapter 9 for a detailed discussion on current and emerging global health issues and concerns.

> This link has been strengthened by the recent UN reform proposals to elevate public health as a foreign policy priority to support the four governance tasks served by foreign policy: security, economic well-being, development and human dignity. The emergence of health as a domain for foreign policy presents opportunities and risks for health promotion that can be managed by emphasizing that public health is a public good that benefits all those governance tasks.
>
> —de Leeuw, Cho Tang, and Beaglehole 2007, p. 2

More recently, Canada hosted the 19th International Union for Health Promotion and Education World Conference in 2007 in Ottawa entitled *Health Promotion Comes of Age: Research, Policy and Practice for the 21st Century* (PHAC 2008a). This conference provided an opportunity to reaffirm the commitment and vision of the Ottawa Charter (1986) and the Bangkok Charter (2005), and it also provided an opportunity to look at the future and enhance the building of national and international partnerships and inter-sectoral collaborations for health promotion and research.

Current Developments in Public Health in Canada: 2000 and Onwards

The Canadian Institutes of Health Research (CIHR) Act was passed by Parliament in 2000, establishing the CIHR with a new and bold vision to transform health research in Canada based on international standards of excellence. The CIHR's vision and mandate clearly distinguished it from its predecessor, the Medical Research Council (Rutty and Sullivan 2010). Specifically, passage of the CIHR Act formally recognized the value of engaging in interdisciplinary and integrative health research that recognized the continued importance of laboratory-based biomedical and clinical research, but expanded it to include the importance of the health of populations across the life span, health services, health systems, and societal, cultural, and environmental influences on health. As a part of the transformation, 13 separate virtual institutes were created including the internationally unique Institute of Population and Public Health (IPPH).The IPPH's current mission for the years 2009 to 2014 and strategic research priorities are in concert with several global calls to reduce health inequities within and between countries and to develop and evaluate effective health policies and programs that lead to population-based health improvements and the promotion of health equity (IPPH 2009).

The second major development that has greatly influenced the scope and mandate of public health is related to the 2003 SARS pandemic. The first Canadian outbreak of SARS was linked to a female returning from a vacation in Hong Kong in May, 2003 (Health Canada 2008; Naylor 2003, Varia et al. 2003). As of September 5, 2003, there were 438 cases of SARS reported in Canada and 85% of these cases were in Ontario and the Greater Toronto Area (GTA) (Health Canada 2008; Varia et al. 2003). As a consequence of the SARS pandemic, 44 individuals died, over 400 became seriously ill, and approximately 25,000 individuals in the GTA were placed under quarantine, and the WHO issued travel warnings to Canada. Moreover, the economic costs associated with the SARS pandemic for Toronto alone were estimated to be $35 million per day (Rutty and Sullivan 2010).

Dr. David Naylor's (2003) inquiry into the SARS crisis in Canada lead to the report entitled *Learning from SARS: Renewal of Public Health in Canada*, which highlighted several deficiencies in our public health capacities to manage such a crisis. Moreover, Naylor (2003) strongly recommended that the federal government establish an independent agency for public health to co-ordinate and more effectively manage public health crisis such as SARS. Subsequently, the PHAC was established in September, 2004, and confirmed by Parliament in December, 2006, by the PHAC Act (PHAC 2006; Rutty and Sullivan 2010). The Act also recognized and empowered our first Chief Public Health Officer (CPHO), Dr. David Butler-Jones, to introduce legislation in the interest of public health and safety. Currently, a variety of Canadian health centers, laboratories, and branches report to the CPHO including the Centre of Emergency Preparedness and Response, Infectious Disease and Emergency Response, Laboratory for Foodborne Zoonoses, Office of Public Health Safety, National Microbiology Laboratory, and the Pandemic Preparedness Secretariat (PHAC, 2006). The PHAC also shares expertise, critical health-related information, and collaborates closely with various international health agencies such as the WHO, European Centre for Disease Prevention and Control, and the Centers for Disease Control and Prevention.

The SARS pandemic, amongst other crisis (e.g., 2000 Walkerton *E-coli* water crisis, 2005 H5N1 pandemic, 2008 Maple Leaf deli meat national listeria outbreak, and 2010 federal ban on bisphenol A [BPA] for plastic bottles) has resulted in growing public interest in public health during the past decade. This is reflected in the growth of schools and programs in community and public health in Canada. In fact, during the 1990s, there were only 5 programs in public health in Canada and by September 2011, 15 universities were providing Masters of Public Health (MPH) or similar programs in community health. There has been an explosion of undergraduate programs in public health including Brock University, Ryerson, McMaster University, Queen's University, University of Western Ontario, University of Alberta, University of British Columbia, Université de Montréal, University of Saskatchewan, the University of Ontario Institute of Technology, University of Victoria, to name but a few. Many of these universities are now offering both undergraduate and graduate training opportunities in public and/or community health (Masse and Moloughney 2011). These programs are critical for developing a critical mass of public health professionals and workers in Canada to address current and emerging health issues across the life span, and for creating a cadre of individuals who will exert positive health ripple effects for decades to come (PHAC 2012; Rutty and Sullivan 2010).

Add to your knowledge of the history of public health in Canada by accessing the following resources.

Web-based Resource Box 2.7 History of Public Health in Canada

Learning Resource	Website
City of Toronto Archives, Infectious Idea: 125 years of Public Health in Toronto. City of Toronto Archives (1998–2013). This website showcases an exhibition celebrating 125 years of public health in Toronto through archival photographs and documents from 1883 to present.	http://www.toronto.ca/archives/public-An health/index.htm
Public Health Agency of Canada. (2008). The Chief Public Health Officer's Report on The State of Public Health in Canada in 2008. Canada's Public Health History Chapter 2. Ottawa, ON: Author. This websites provides the reader with a brief historical overview of the history of public health in Canada from the 1830s to the 2000s and major developments.	http://www.phac-aspc.gc.ca/cphorsphcrespcacsp/2008/fr-rc/cphorsphc-respcacsp05b-eng…
Rutty and Sullivan (2010). An excellent resource that details the history of public health in 8 chapters from Confederation in 1867 to the Epp Report in 1986.	http://www.cpha.ca/uploads/history/book/Historybook-print_ALL_e.pdf

Future Directions and Challenges

Both our understanding and definitions related to the concept of health has evolved dramatically over the centuries. Currently, there is a growing recognition globally that health is not only affected by one's biology, but is influenced by a variety of SDH (Health Canada 2002; PHAC 2007; Raphael 2004, 2010; Rootman et al. 2012; Singh and Dickinson 2009). Because public health issues and threats often transcend political or international borders (e.g., bioterrorism, H1N1 Swine flu pandemic, migration of the West Nile virus into Canada, Mad Cow Disease, air pollution), one of the major challenges we face is the need to consider health from both national and global perspectives when planning primary healthcare initiatives and interventions (Edwards 2001; Hodge et al. 2002; McDade and Franz 1998;Watson 2007). A recent study commissioned by the World Economic Forum estimated that cancer, diabetes, mental illness, heart disease, and respiratory illnesses could cost the global economy more than $47 trillion (United States) due to lost productivity due to illness over the next 20 years (Bloom et al. 2011).

Undoubtedly, health is perceived by many to be a desirable yet dynamic process that can be positively or negatively affected by an array of internal and external factors (e.g., global economic downturns, pandemics, tornado's, floods, contaminated water or food supplies) (Hodge et al. 2002; Edwards 2001; D'Arcy 1986). In order to practice safely and effectively, public healthcare professionals and workers must be knowledgeable and vigilant regarding actual or potential threats to the health and well-being of our residents. Instead of having healthcare professionals such as physicians and registered nurses responsible for identifying public health problems of concern, individuals are now being encouraged to empower themselves and to define health issues they perceive as relevant in Canadian society (Butler-Jones 2012; PHAC 2007). Public health in Canada requires commitments to the valued ideals and beliefs in our society related to equity, social justice, and sustainable development; recognition of the importance of the health of entire communities as well as the individual; and respect for diversity, self-determination, empowerment, and community participation (PHAC 2007; Rootman et al. 2012).

The second major challenge is to develop national standards of health that clearly define and regulate primary health efforts that embrace health promotion and the 5 levels of prevention (British Columbia Ministry of Health 2013; National Public Health Partnership 2006; Porta 2008; Public Action Support Team 2011). For

example, although Section 3 of the CHA supports the concept of health promotion, which includes protective, promotive, and preventative services, the specific methods or strategies for delivering public health promotion services on a national basis are not described in the Act (Government of Canada 1984). Unfortunately, the CHA was devised to limit its focus on medically necessary physician and dental–surgical publicly insured acute healthcare services that are primarily hospital-based as opposed to those that embrace the primary healthcare model that encompasses health promotion and holistic definitions of health (Bartfay 2010a; Bartfay and Bartfay 2015). In addition, it is also regrettable that the components of health promotion are not required in order for the 10 provinces and 3 territories to meet their obligations surrounding the 5 founding criteria of the CHA to qualify for health transfer payments from the federal government (Government of Canada 1984). The reader is referred to Chapter 3 for a detailed discussion of the CHA and how public healthcare services are financed in Canada. The extent toward which the various provinces and territories in Canada provide public health promotion services to their residents varies considerably in quality and quantity across Canada (Romanow 2002; Sullivan and Baranek 2002). Hence, there is a need to create new legislations and standards of healthcare to replace these outdated and costly medical models of health with more cost-efficient and effective holistic primary health models of care (Adams et al. 2008; Frank, Di Ruggiero, and Moloughney 2003; National Expert Commission Canadian Nurses Association 2012; Soroka and Mahon 2012; Starfield 2011).

The third major challenge is to identify health priorities in Canada (Bartfay and Bartfay 2015). Although communicable (infectious) diseases such smallpox, TB, measles, and polio were the leading causes of mortality during the 19th and 20th centuries, they have been replaced by complex non-communicable chronic diseases and disabilities (Rutty and Sullivan 2010). In fact, NCD disease are responsible for 89% of all deaths in Canada, and chronic illness and disabilities are major drivers of healthcare costs and lost productivity for our nation (National Expert Committee Canadian Nurses Association 2012; WHO 2011). Moreover, more than 40% of Canadian adults report having at least one of the following 7 common health conditions: arthritis, cancer, emphysema, chronic obstructive pulmonary disease (COPD), diabetes, heart disease, hypertension, or a mood disorder (Canadian Academy of Health Sciences 2010). Many of these conditions are amenable to healthy public policies, preventive care, and treatments that focus on monitoring and maintenance of health from a holistic perspective.

Total healthcare spending continues to rise in Canada, due in part to a lack of coordinated national and provincial/territorial public health promotion efforts and strategies, which seek to promote and support the need for active and healthy lifestyles to help curb the growing incidence of various chronic NCDs (e.g., type 2 diabetes, heart disease, and stroke). For example, a startling 90% of Canadians are aware that cardiovascular disease is preventable, but the vast majority do not appear to be aware of the associated lifestyle risk factors (e.g., diet high in saturated and trans fats, excessive dietary salt intake, inactivity, and smoking) (PHAC 2008b; MacDonald et al. 1992). Moreover, between 1985 and 2001, the number of obese Canadians almost tripled from 5.6% to 14.9% (Hales and Lauzon 2007), and physical inactivity has been shown to cost our publicly insured healthcare systems in excess of $2.1 billion annually (Katzmarzyk et al. 2000). The PHAC (2015) notes that currently 48% of Canadian adults report being inactive, meaning that that their level of physical activity was not sufficient to meet the threshold of at least moderate activity. Moreover, evidence shows that as much as half of the decline in the ability to perform usual activities of daily living between the ages of 30 and 70 is the result of an inactive lifestyle (PHAC 2015).

This trend related to inactivity and the growing number of Canadians who are overweight or obese is continuing. In fact, more than half of adult Canadians are inactive and only 9% of children and youth (aged 5–19 years) meet the recommendations in *Canada's Physical Activity Guide for Children and Youth* (Canadian Fitness and Lifestyle Research Institute 2007, 2005; Canadian Society for Exercise Physiology 2012). Regular physical activity actually helps to prevent chronic diseases and premature death. Moreover, individuals who are physically active tend to be significantly healthier in comparison to their sedentary counterparts.

The fourth major challenge is to have politicians, policy makers, and public healthcare professionals and workers embrace holistic definitions of health based on the SDH. This also encompasses a willingness to reform our healthcare systems and embrace holistic primary healthcare models of delivery (Browne et al. 2012; Mikkonen and Raphael 2010; Muntaner et al. 2012). Simply stated, our current outdated medical model

of health is costly, not sustainable from a tax-base perspective, and is not able to meet the diverse health challenges facing Canadians in the new millennium (Adams et al. 2008; Soroka and Mahon 2012; Starfield 2011). For example, in 2015, our national healthcare expenditure was in excess of $219.1 billion, compared with only $12.2 billion in 1975 (CIHI 2010a; CIHI 2015a, 2015b). This 2015 figure translates into $6,106 per person or 10.9% of Canada's entire gross domestic product (GDP) (CIHI 2015a, 2015b). Bunker, Frazier, and Mosteller (1994) have estimated that during the past century, a total of only 5 of the 30 years (16.7%) related to one's life expectancies can be credited to medical practice alone.

In Canada, this is despite the fact that 95% of healthcare expenditures are spent on physician- and/or hospital-driven acute care health services, whereas less than 5% are spent on public health promotion efforts (Brown et al. 1992; CIHI 2015a; Frank, Di Ruggiero, and Moloughney 2003). In fact, acute care hospital-based healthcare services continue to account for the largest component accounting for 29.5% of healthcare expenditures in 2015 (CIH 2015a,b). Payments to physicians represent Canada's third-largest share of healthcare expenditures, accounting for approximately 15.5% of healthcare expenditures in 2015. CIHI (2015a,b) reports that total payments to physicians increased almost 6% in 2014, reaching a record total of $24.1 billion.

We argue that these elevated costs are associated, at least in part, with a decreased emphasis on home- and community-based healthcare services and primary health promotion initiatives and programs nationally (Bartfay and Bartfay 2015). There is also a growing need to encourage research to validate the cost savings and effectiveness of primary healthcare models based on the SDH (Browne et al. 2012; Butler-Jones 2012; Muntaner et al. 2012).

Group Review Exercise Box 2.1 "MS Wars"

About this investigative documentary

Multiple sclerosis (MS) is a debilitating disease, and there is currently no known cure in Canada or abroad. The effects of MS are cruel and include fatigue, progressive loss of muscle control, increasing debility, and decreasing quality of life. *MS Wars* is a CBC documentary that explores the science, scientific controversies, and human drama around a novel experimental treatment called *Liberation Therapy* (aka chronic cerebrospinal venous insufficiency or CCSVI). This treatment was first detailed and pioneered by the scientist Dr. Paolo Zamboni in Northern Italy in 2009. A small research paper by Dr. Zamboni was released online before it was published in the traditional journal print format. Immediately, this new experimental intervention for MS was circulating globally via various social media circles, and created a sudden explosion of interest and attention by MS clients, their loved ones looking after them, and healthcare professionals and researchers. This documentary explores the concept of health, personal values, and meanings surrounding this concept, and how it is believed to be achieved or obtained by clients suffering from this chronic disease with currently no known cure.

The scientific community has developed research protocols (e.g., randomized clinical trials [RCTs]), processes and sociopolitical systems regarding how health research should be conducted and how they provide *evidence-informed care* in their clinical practices. These protocols, processes, and systems have been entrenched in the way public healthcare researchers and providers go about doing their business for centuries. But, this time, the traditional health research system is being challenged by 2 factors: hope, and the power of the Internet and social media as a means of communicating health-related information and treatments. This documentary explores how the Internet has spurred a global social network movement that is changing and challenging traditional physician/client relationships and the repercussions for research and public health in Canada. A few Canadian clinics began to look into this noted clinical intervention, but the Canadian public health establishment (aka Medicare in the provinces and territories) were reluctant to proceed with an unproven treatment that had not followed the proper traditional and socially embedded research protocols and required RCTs required by the public health scientific community. With an increasing number of clients electing to get the treatment in private clinics or abroad, video testimonies and other forms of anecdotal evidence soon began to appear on the Internet showing miraculous improvements to the health-related quality

of lives of these clients. Many began traveling out of the country for the procedure paying for their own treatment—often without telling their physicians.

Instructions:
This assignment may be done alone, in pairs or in groups of up to 5 people (note: if you are doing this assignment in pairs or groups, please submit only one hard or electronic copy to the instructor).

- The assignment should be typewritten and not more than 4 to 6 pages maximum in length (double-spaced please).
- View the documentary entitled *MS Wars: Hope, Science, and the Internet* which aired on Thursday August 30, 2012 on CBC-TV and on Thursday September 6 on CBC News Network.
- See link: **https://www.youtube.com/watch?v=9Xo2dBOeHIA**
- View this documentary and take detailed notes during the presentation.

i. Provide a brief overview of the salient points in this documentary.
ii. Comment on who is ultimately responsible for their own health? The individual afflicted with the disease or disorder or healthcare professionals?
iii. Can an individual with a chronic debilitative disease such as MS ever be healthy? Discuss why or why not.
iv. Highlight some of the negative and positive ripple effects related to this controversial experimental treatment for MS as part of the client's quest to be healthy based on their unique values and meanings related to this concept.
v. Briefly discuss how social media, public opinion, and the Internet can affect the mandate of provincial/territorial public health officials or governments via political lobbying and pressure.

Summary

- The concept of health and the evolution of various definitions of this state of existence over time is interwoven with the history of agricultural societies and the development of various civilizations; the growth of religious practices and beliefs; shamanism and other healing practices; pharmacy; and medicine, nursing, and developments in public health.
- Health is a ubiquitous and dynamic term with diverse interpretations and meanings to individuals in different cultures across the life span.
- Health is not a single state or goal, but a process that involves various interconnected and interdependent factors and dynamic states of existence.
- The worship of nature became a logical vehicle upon which primitive agricultural societies based their healing practices, mythologies, and religious practices because it directly influenced their prosperity and survival.
- Hippocrates (460–370 BCE) is regarded as the father of modern empirical or rationale medicine and was the first to dismiss the belief that disease or states of ill health were caused by angry spirits, demons, or deities, but resulted as a consequence of a break in the laws of nature.
- The Romans believed that altered states of health and disease were caused by natural sources, especially bad water supplies and raw sewage. Hence, they became experts at draining swamps and marshes associated with malaria for example, and built extensive aqueducts, public toilets, and proper cemeteries for their deceased.
- Romans believed that everyone in their Empire was entitled to good health, and were the first civilization to introduce a program of public health for all their citizens regardless of their age, occupation, or wealth.
- During the Byzantine Empire (later Roman period—fourth-century CE), significantly more male deacons and monks practiced nursing in community settings and charitable institutions, in comparison to female deaconesses and nuns.
- During the Middle Ages, various military nursing orders of knights (e.g., Teutonic Knights, Knights of St. John, Knights Hospitallers) provided care to the wounded on the battlefields during the

Crusades abroad, protected those who could not defend themselves, and were the first documented public health nurses to provide care to individuals afflicted with leprosy in the world.

- The association between physicians and hospitals as places of practice, first occurred during the middle ages where they were called upon to make in-house diagnosis or to treat clients.
- During the 16th and 17th centuries, we observed the beginning of scientific investigations to explain the mechanistic functioning of the human body.
- Health from this perspective has evolved into the so-called laboratory-based mechanistic "medical model," which attributes alterations to health as malfunctioning biological components resulting from disease processes.
- Louis Pasteur (1822–1895) brought about a revolution in medicine when he linked tiny microorganisms with the development of disease and confirmed the unicausal germ theory of disease origin.
- The modern era of healthcare has been dominated by the laboratory-based mechanistic medical model of health, with the emphasis on diagnosis, treatment, and cure of disease as opposed to health promotion and prevention.
- During the turn of the last century, hospitals evolved into primary centers for accessing healthcare services due to the growing use and application of diagnostic medical technologies (e.g., x-rays) that physicians could not afford in private practice settings.
- This also resulted in a growing demand and need for nurses in hospitals and a dramatic decline in the number of home and public health nurses in Canada.
- Developments in public health during the early part of the 20th century in Canada included school-based immunization programs against smallpox and diphtheria, and the appointment of nurses by school boards to monitor the health and wellness of children.
- In 1948, the Government of Canada established the National Health Grants Program, which served as a stimulus for the development of basic public health infrastructures and programs in the provinces over the next 3 decades.
- These programs consisted of grants-in-aid to the provinces to help fund the education and training of physicians and nurses, TB control, mental health, cancer control, and child and maternal health programs.
- The document known as the Lalonde Report (1974) challenged the unicausal medical model of health and illness by introducing the following 4 critical determinants of health: human biology, environment, lifestyle, and healthcare organizations.
- In 1986, Jake Epp expanded on Lalonde's Report (1974) by extending the definition of health promotion to include a wide range of sociopolitical and environmental determinants of health.
- The Ottawa Charter for Health Promotion (1986) outlined 5 broad global strategies to achieve global health promotion and challenged the unicausal medical definition of health and associated care delivery models.
- Although this definition has been criticized for being too broad in nature, for concentrating too much on a condition of health rather than a process, and for being impossible to achieve by many, it remains the most widely quoted definition of health globally that has Canadian origins.

Critical Thinking Questions

1. Construct your own unique definition of health and see how it contrasts with the definition of health provided in this chapter and the WHO's (1978) definition. What are the similarities and differences in comparison to your own definition of health?
2. As a public healthcare professional or worker, what questions and criteria would you employ to assess the health of specific individuals versus those of families, groups, communities, or entire populations? How do your questions and criteria vary and how would you assess the effectiveness of targeted primary health interventions, strategies, or policies?
3. Select a determinant of health that you believe is most important for positively influencing the health and well-being of residents in your community. Why did you choose this determinant and what evidence is there to suggest that it is the most important determinant per se? How would you employ this evidence to shape public health policies or practice in your community?

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