

Review Paper

The Development of Bioethics: Historical Facets Vital in the Foundation and Development of Healthcare Bioethics

Janvier Nzayikorera

Independent and Non Affiliated Researcher, Kigali, Rwanda

Corresponding Author: Janvier Nzayikorera

E-mail: agneaujesus@gmail.com

ABSTRACT

In 1927, Fritz Jahr used Bio-Ethik in his Publication entitled Bioethics: A Review of the Ethical Relationships of Humans to Animals and Plants. About four decades the use of bioethics remained unpopular. In early 1970s, Van Rensselaer Potter reinitiated the use of bioethics in his paper entitled Bioethics: The science of survival and in his book entitled Bioethics: Bridge to the Future. Without considerations for when and who firstly coined the term bioethics, it appears that, bioethics has remained significant from its time of inception to its current status as global multi-interdisciplinary and applied field of ethics that integrates all foundations of life related scientific activities. Healthcare Bioethics should be regarded as a branch of bioethics that focuses on the application of ethical principles as mechanism of wisdom enhancement in regard to dialogues and decision making related to certain healthcare events and situations. Such dialogues should encompass scrutiny not only facts and statuses adjoining each event, but also standards which prime all healthcare related clients, healthcare teams and institutions deciding to recommend, accept or refuse certain demeanor. Understanding historical perspectives of healthcare bioethics is crucial. However, there is insufficient compiled literature unfolding precisely history of healthcare bioethics. The goal of this article is to describe historical facets vital in the foundation and development of healthcare bioethics with reference to four eras namely: (1) Pre-Conceptional Era of Healthcare Bioethics, (2) Gestational Era of Healthcare Bioethics, (3) Birth, Growth and Developmental Era of Healthcare Bioethics and (4) Maturity Era of Healthcare Bioethics.

Keywords: Ethics, Bioethics, Healthcare Bioethics, Historical facets of Healthcare Bioethics, Foundation of Healthcare Bioethics, Development of Healthcare Bioethics

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Introduction

In 1905 George Santayana narrated that “those who-cannot remember the past are condemned to repeat it” (https://en.wikiquote.org/wiki/George_Santayana). Bioethics is relatively considered as a new discipline that emerged as results of: 1) scientific activities related to life, 2) advance of technology, 3) religions and 4) unfavourable decisions of some people towards other forms of life including life of their fellow human beings (for instance: use of human subjects in experimental studies without their voluntary informed consents, wars, unfair distribution of scarce health related resources, destruction of ecosystem etc.) [1-3]. In case acts of forgiveness are not applied, anyone who could attempt to repeat some of the wrong actions that led to existence of bioethics would be condemned at all! Although bioethics is relatively considered as a new discipline, some of its

branches should not be considered to be new. For instance, with thorough analysis, it is clear that healthcare bioethics existed prior to ushering the movement of bioethics as new discipline. Events that led to the existence of healthcare bioethics are complex. In fact, some of those events started long ago in Paleolithic time. For illustration, about 3 to 2 million years ago, a reduction of rainfall caused the shortage of food (especially fruits). And prolonged draughts inspired early ancient hominins to increase hunting activities, and they started eating tubers and roots in order to obtain adequate energy and other nutrients. For survival and protection purposes those early ancient hominins adopted the principles of solidarity [4] which is similar to the partnerships established by most of the modern world people while trying to mitigate certain threats that could hinder the progression of life or health on the earth.

Several scholars and experts have repeatedly asserted that, bioethics as new discipline started in about 1960s-1970s [5-7]; thus, anticipated period for the start of healthcare bioethics as one of its branches [8]. However, that is only true in terms of reviving and giving a name but wrong in terms of time and how bioethics (or particularly healthcare bioethics) started. In fact, the first use of the term bioethics (Bio-Ethik) in literature stems back in 1926-1927, when Fritz Jahr used it in his paper entitled "Bio-Ethics: A Review of the Ethical Relationships of Humans to Animals and Plants" [9]. Moreover, he stressed bioethical imperative regarding the use of animals and plants in scientific research [2,7,10-11]. About four decades the usage of the term bioethics remained unpopular. In 1970 and 1971, a North American Oncologist Van Rensselaar Potter reintroduced the usage of bioethics as he used it in his paper entitled "Bioethics: The science of survival" and in his book entitled "Bioethics: Bridge to the Future" respectively [5-6]. With no respects to when and who firstly coined the term bioethics, it appears that, bioethics has remained vital from its time of inauguration to its current status as global multi-interdisciplinary and applied field of ethics that integrates all foundations of life and health related scientific activities.

In 1998 Darryl Macer clearly asserted that bioethics is love of life [2]. In reality love of life started long ago not just in 1970s. Despite the fact that, some people have disrespected life and dignity of their fellow human beings. There is critical evidence that numerous heroic actions and commitments of many people who loved life have been visible since antiquity until present time. As evidence indicates, since antiquity, human beings have invented unstoppably in order to discover skills, knowledge and practices that could lead to the attainment of optimum health status and ensure the progression of life on the earth. For many centuries such knowledge has been exponentially increasing, but regrettably starved of exponential advance of wisdom. Yet, wisdom is recognized as "the knowledge of how to use knowledge for human survival and to improvement in the quality of life" [5, 12-13]. Thanks to Potter for instituting bioethics as a new discipline that aim to raise wisdom for human survival and to upgrading the quality of life. However, if bioethics is love of life, considering 1960s-1970s as starting reference point for its history is an incomplete history. The coherence and harmony of understanding the historical standpoints of how ethics has been applied in healthcare settings as means of raising wisdom with anticipated results of improving health status of world's population is very crucial. Nevertheless, there are insufficient compiled literatures unfolding precisely the history of healthcare bioethics.

Each decade, each century, each field, each country, each region, each continent has its own great people and each of us has his/her own heroes. And in point each of these has a good and bad past event to remember. Averting, the history of healthcare bioethics without considering the contributions of great famous people such as Hippocrates, Aristotle, Alexander the great, Galen, Ambrose Pare, Andreas Vesalius, John Hunter, Edward Anthony Jenner, Joseph Lister, Louis Pasteur, John Snow, Fritz Jahr, Alexander Fleming, Van Rensselaar Potter, Ken Newell, Halfdan T. Mahler, Mr. James P. Grant, and plus more others would be an alien history. The scope of this paper is not about describing detailed contributions of these famous people, but Table 1 highlights some of their achievements in terms of promoting human dignity, health related science, advancement of healthcare and development of healthcare bioethics practices. It is also crucial to consider the influence of religions, political, philosophical, industrial revolution, different

epidemics/pandemics, wars, slavery trade, colonization and different scandals that disrespected the dignity of human beings in terms of advancing healthcare bioethics. In order to incorporate all these together, this article describes historical facets vital in the foundation and development of healthcare bioethics with reference to four eras namely: 1) Pre-Conceptional Era of Healthcare Bioethics (B.C., A.D. to 1749s), 2) Gestational Era of Healthcare Bioethics (1750s to 1947s), 3) Birth, Growth and Development Era of Healthcare Bioethics (1948s to 1990s, and 3) Maturity (but not elderly) era of Healthcare Bioethics (1991 to present). The rationale for this classification is contingent with certain remarkable right and wrong actions/events which attempted to: respect or disrespect the dignity (health) of human beings. Correlating those events with current practices and further elaboration for this classification will be explained in subsequent sections of this paper

Table 1: Some remarkable contributions to the advancement of healthcare and healthcare bioethics by some famous Scientists /Philosophers/Physicians

Name and time lived	Key Remarkable contributions and comments
Hippocrates (450-380 B.C)	<ul style="list-style-type: none"> • A Greek philosopher and physician • A father of modern medicine • The first person to affirm that diseases are not caused by superstition. • His works is found in Hippocratic corpus. • Hippocratic oath remains relevant in modern medical fields
Aristotle (384-322 BC)	<ul style="list-style-type: none"> • A Greek philosopher and physician • He is considered as gold father of evidence-based medicine. • Aristotelian principle common sense and logic is still relevant today
Alexander the great	<ul style="list-style-type: none"> • A founder of School of Alexandria in 3 Century BC • The school of Alexandria became a center of ancient scientific knowledge. • Historical Famous Physicians such as Herophilus, Erasistratus and Galen, were trained from the Alexandria school of medicine
Ambrose Pare (1509-1590)	<ul style="list-style-type: none"> • A French Berber Surgeon • Invented various surgical innovations such as wound management, hemorrhage prevention via arterial ligation during limb amputations, treatment of war-related head and spine injuries. • He emphasized gently procedural strategies in order to reduce pain and improve outcome for all of his clients, thus compassionate and empathic principles • Credited as a father of modern surgery
Girolamo Fracastoro (1478–1553)	<ul style="list-style-type: none"> • An Italian doctor • The first person to suggest that pathogens from outside the body may be responsible for the occurrence of certain epidemics. • He proved human to human infections transmission mechanism
Andreas Vesalius (514-1564)	<ul style="list-style-type: none"> • A father of human anatomy(14) • He published a famous anatomy book entitled “De Humani Corporis Fabrica” that has become the foundation for modern human anatomy(15)
John Hunter (1728-1793)	<ul style="list-style-type: none"> • A father of scientific surgery • He was a teacher and collaborator of Edward Anthony Jenner
Edward Anthony Jenner (1749–1823)	<ul style="list-style-type: none"> • An English Physician and scientist • The originator of the concept of vaccine • He invented the vaccine against smallpox. • He is credited as father of immunology. • Ethically, by 1958 WHO opted to use the vaccine he discovered and in 1980 smallpox was eradicated Worldwide [16-17].

	<ul style="list-style-type: none"> • Thus, he is ethically and acceptably considered as man who saved many lives than any other person on this world
John Snow (1813–1858)	<ul style="list-style-type: none"> • A father of modern epidemiology • His discoveries supported to control numerous epidemics including Cholera
Louis Pasteur (1822-1895)	<ul style="list-style-type: none"> • An originator of germ theory • This theory supported to disapprove long held theory (miasma, bad air) as cause for infectious diseases. • Germ theory allowed to save many lives
Joseph Lister (1827 – 1912)	<ul style="list-style-type: none"> • An originator of antiseptic • His antiseptic practices saved many lives
Alexander Fleming (1881-1955)	<ul style="list-style-type: none"> • An originator of antibiotic (Penicillin) in 1928 • A receiver of the Nobel Prize in Physiology or Medicine 1945 • Antibiotic have saved many lives
Fritz Jahr (1895-1953)	<ul style="list-style-type: none"> • He was a German protestant theologian. • A first person who used bioethics in literature (1927) in paper “Bio-Ethics: A Review of the Ethical Relationships of Humans to Animals and Plants” • Some Scholars consider him as an originator of European bioethics
Van Rensselaar Potter (1911-2001)	<ul style="list-style-type: none"> • A North American Oncologist • Remarkable influencer for the foundation of bioethics as a discipline • Considered by some scholars as an originator of American bioethics. • His major publications with respect to bioethics include: <ol style="list-style-type: none"> 1) Bioethics: The science of survival an article published in 1970 2) Bioethics: Bridge to the Future (A book published in 1971) 3) Global Bioethics: Building on the Leopold Legacy (a book published in 1988)
Ken Newell	<ul style="list-style-type: none"> • An influencer for the existence of health for all ambition by 2000 • An influencer for the existence of Primary Health Care (PHC) • Goals of Bioethics, PHC and health for all positively correlate • Adoption of core bioethical principles in all sectors could support to achieve health for all
Halfdan T. Mahler (1923-2016)	<ul style="list-style-type: none"> • A Danish who specialized in tuberculosis • A third Director-General of World Health Organization from 1973 to 1988 • He vastly influenced the existence of PHC and health for all ambition by 2000. • Goals of Bioethics, PHC and health for all positively correlate
Mr. James P. Grant (1922-1995)	<ul style="list-style-type: none"> • Ethically, he saved lives of many children via endorsing UNICEF Declaration of <i>Children’s Revolution</i> in 1982 • Such revolution contained: 1) Growth Monitoring, 2) Oral Rehydration, 3) Breastfeeding, 4) Immunization, 5) Food supplementation, 6) Female literacy and 7) Family planning (GOBI...FFF) • In 1987, He launched Bamako initiative that saved lives of many children of developing countries (Especially Sub-Saharan Africa) • Adoption of core bioethical principles in all sectors could support to achieve health for all

Preconceptional Era of Healthcare Bioethics (B.C., A.D. to 1749s)

‘Those who don’t know where they are coming from cannot know where they are going’ [18]. Planning to ensure the proper progress of life of all living things including life of human beings

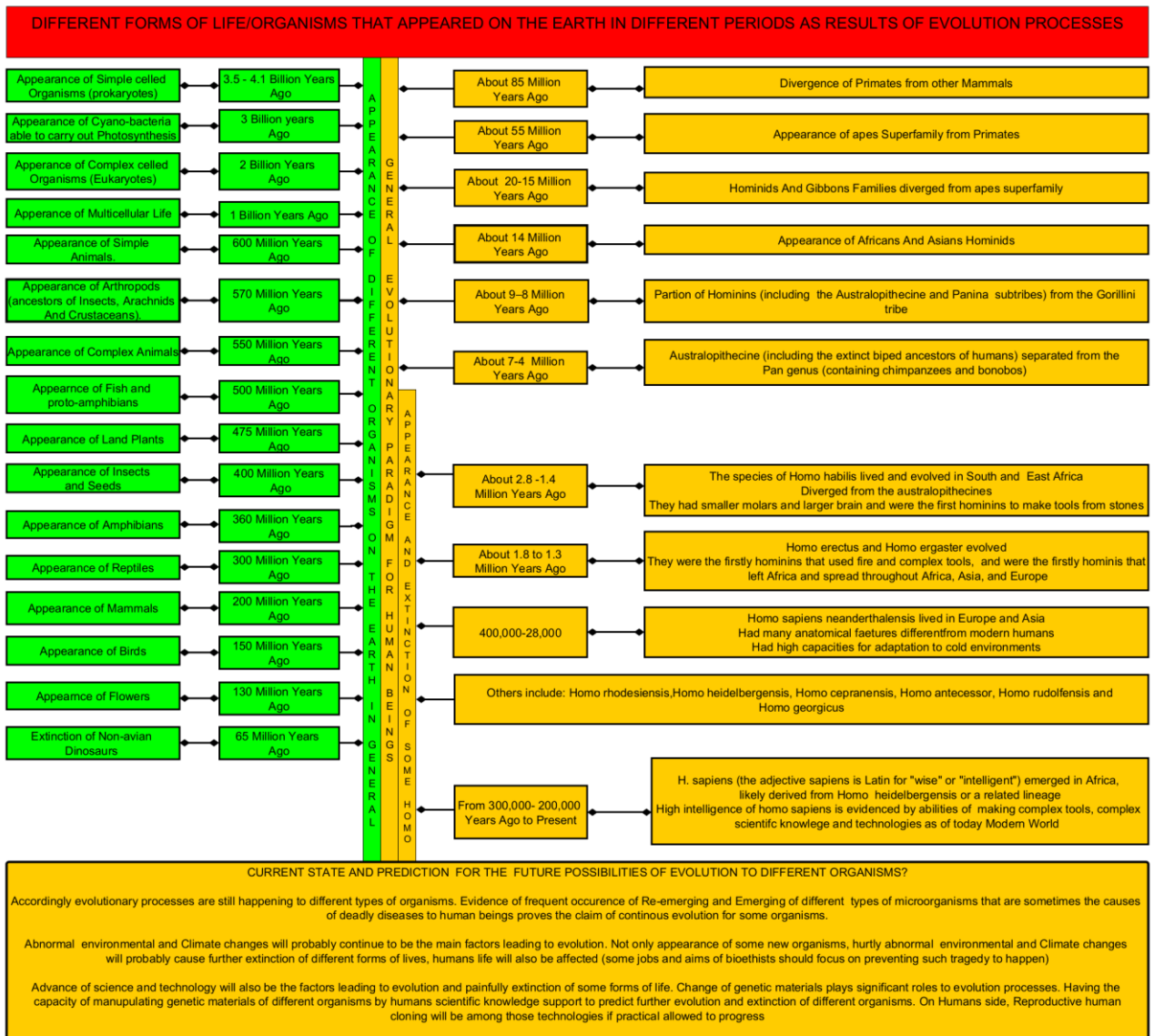
without the knowledge of how life started and progressed and what attempted to hinder such progress is blamably plan for the future that would just fail without reaching on third counts. According to scientific evidence, the earth is about 4.5 billion years old. About 3.5-4.1 billion years ago, life on the earth became possible firstly with appearance of simple celled organisms (prokaryotes) [19]. Through complex evolutionary processes with support of molecular [20] and environmental changes other organisms evolved. Figure 1 shows a timeline of different organisms that appeared on the earth in different periods. Evidence indicates extinction of numerous types of organisms. However, reasons that led to such extinction are not clear. Did such extinction happen spontaneously? Did it happen due to humans' activities? Could such extinction be linked to genetic diseases? Could such extinction be linked to the failure by extinct human species to adapt to the abnormal changing environment and climate as per Darwinian adaptation mechanism? Could we allot higher likelihood to abnormal environment and climate change to have been the cause for such extinction as we currently see how dangerous abnormal environment and climate change is to the health of human beings and life of other living things? With this, in our minds, can we predict further extinction of current species of human beings in future centuries? It is a duty of bioethicists and other people "to safeguard and promotes the interests of the present and future generations" [21]. What are the views of bioethicists in regard to extinction of some living things? Guided by the 'importance of biodiversity and its conservation as a common concern of humankind' [21] as it is proclaimed in the Universal Declaration on Bioethics and Human Rights, building the bridge to the future in terms of reversing history is possible in case we promote one health and love of life which is equal to Bioethics. Removing all possible factors (e.g. abnormal climate change) that are likely to cause extinction and compromises to the future human generations would be mark as great achievement with respect to such duty.

Possession of systematizing mechanism (special circuits in the human brain that allows looking for different patterns around the World in order to invent something new) indicates higher intelligence of human beings than other living organisms. Bipedalism, encephalization, tools making marks such intelligence [22]. *Homo habilis* that evolved around 2.8 million years ago was the earliest human species to use stone tools. *Homo erectus* which lived between 1.8 million years ago to 70,000 years ago was the first human species to invent fire. The modern species of human beings *Homo sapiens* (Latin: "wise man") originated in Africa in about 300,000 years ago [4,23] and spread Worldwide. *Homo sapiens* have invented complex tools and technologies. Progressively, discovery of fire supported homo to eat cooked foods. Consuming cooked foods supported homo for ease digestion and other physiological processes including encephalization. Bipedalism was adopted for protection purposes. As erect position would easily support *Homo erectus* to recognize and localize voices of predators. Additional erect position would support *Homo erectus* to carry different items and physiologically, it would support them for body thermal regulation. With support of diets the nervous system of ancient human beings were enhanced. Encephalization elevated as there is notable evidence that neocortex extended to 76% likened to the average 16% in other animals [4].

Diets contributed to encephalization and in turn to improved cognitive functions for the brain of ancient human beings. Even in modern world, diets play significant roles in the development of human body tissues. Particularly the brain of human beings needs much of the quality diets during rapid growth and developmental periods. This has been a known fact for many centuries. It is firmly unethical that still in the present modern world many people including pregnant women and children do not receive adequate food and nutrition. Adequate food and nutrition can support in terms of attaining of maximal intelligence which is the most needed trait of which most of the world's people wish to possess. Contrarily, undernutrition could hinder numerous people in terms of gaining such intelligence. Over the centuries, undernutrition has been more prevalent at unacceptable level in many parts of the world. This is a hurting fact because, though some of our ancestors lacked adequate nutrition; undernutrition is not a heritage from our ancestors. Despite such hurting fact, another painful fact is that numerous people have been overburdened with different diseases linked to over nutrition. With support of bioethical principles and theories of

ethics, how can the world’s communities including bioethicists be involved to address the burden associated with malnutrition? In his chapter, ‘Bioethics: a bridge to the future? Published in a book entitled Global Bioethics: What for? 20th anniversary of UNESCO’s Bioethics Programme Mary C. Rawlinson asserted that bioethics needs to make food central to its thinking’ [24]. No doubt if such thinking is accomplished malnutrition (both under and over nutrition) would be eradicated globally.

Figure 1: A timeline showing different forms of life/organisms that appeared on the earth in different periods as results of evolution processes.



Human beings of palaeolithic time lived in caves and somehow in non-contaminated environments because they were absolute hunter gatherers leading to minimal burden of infectious diseases. However, their life expectancy was as low as only 35 years; due to inadequate food and nutrition, lack of shelters, injuries and disabilities sustained while hunting wild animals, etc. Relevant transitional event in the history of human beings stems back about 12, 000 years ago when humans shifted from absolute hunter gatherers to agrarians. With such shift humans established permanent settlements, communities and began to rear various domestic animals. All these improved their quality of life. However, extra tragedies of infectious diseases began to affect humans unacceptably. Due to lack of medical knowledge and technology, the causes for most

diseases were attributed to superstition forces and to the punishments of God (gods) as of people's sins. There was no healthcare facilities; no sufficient trained health workers. Only Religions played roles for supporting sick people using spiritual and magical techniques. For instance, Imhotep (2650-2600 BC) was an Egyptian, clever physician who treated many patients and due to that, Egyptians considered him as their god of medicine.

The history of diseases and need for optimum health status are almost as old as the history of human beings because human beings have been affected by diseases since ancient time. Cancers, genetic diseases, infectious diseases, neurological diseases and injuries are examples of diseases that have been affecting humans since ancient time. A recent review by Potgieter and colleagues indicates that malignant neoplastic lesion have affected human beings nearly since 2 million years ago [25]. They also report other multicellular organisms being affected by cancers about 1 billion years ago. Possibly, mutation that happened spontaneously during evolutionary mechanism led to some of those cancers. Moreover, in such review authors report both intrinsic (inheritable genetic) and extrinsic (environmental) factors to play a role in the induction of cancers. Typically, intrinsic factors are reported to associate with cancers development less than 10-30%, whereas extrinsic factors contribute about 70-90%. Numerous pathogens and chemicals are implicated as environmental factors leading to cancers. Firmly, environmental factors can be preventable with guide of bioethical principles. Thus, all these should ring a bell in ears of both clinical bioethicists and other health related stakeholders because for many centuries cancers have been horrific conditions to the health of several human beings.

Some genetic diseases would have occurred due to errors in heritability and in nucleic acids transcription and translation. And possibly due to the fact that, prior to the discovery of the field of genetic, people lacked knowledge that, mating of closer human couples leads to consanguinity. Though in the modern world, closer mating of human couples still exists in some cultures [26]. Probably, ignorance is one of the factors leading to such practices. But it is unethical, because most of the consanguineous off-springs are unhealthy. Some people with consanguineous traits live in compromised health status and in fact, some do not live long. Article 16 of Universal Declaration of humans Rights gives three points that seem not to prohibit any types of marriage [27]. However, it is unethical and dangerous to favour marriage for closer relatives. In fact, both agreed and forced kind of such marriage still occurs in different societies. Some lucky offspring survive and innocently bear negative health problems linked to such marriage. The contents of this article 16 must be revised, redefined and updated. Bioethicists, Geneticists, Paediatricians, and others must involve in the revision of this article. Ethically such may support to reduce consanguinity and its burden.

Classically since long ago, numerous people did various heroic actions in order to ensure optimal attainment of humans' health status. Hippocrates is credited as the father of modern medicine. He ushered the movement of logical and real scientific thinking about the cause of diseases rather attributing them to superstition forces [28-29]. He asserted that imbalance of four humors (blood, yellow bile, black bile, and phlegm) could be responsible for human diseases. He also developed medical ethics. His legacy (Hippocratic Oath) for respecting human dignity has been critical since ancient time till present modern world [30]. Aristotle ushered the movement of evidence-based medicine. In 343 BC Aristotle was appointed by King Philip II to be a teacher of his son, Alexander the Great and his colleagues including Ptolemy I sorter. Alexander and Ptolemy I influenced advancement of knowledge via establishment of and developing the school of Alexandria (Alexander was a founder, while Ptolemy I established a famous library of Alexandria and a museum). The students of Alexandria adopted common sense and logic (Aristotelian principle) rather than superstition.

Fathers and inventors of some present scientific fields and practices were trained from the school of Alexandria. Among those include: 1) Euclid (a father of geometry), 2) Heron (the first inventor of steam engine), 3) Archimedes (a famous mathematician of antiquity), 4) Eratosthenes (an

astronomer who firstly calculated the perimeter of the earth to the nearest 100 kilometres), 5) Ptolemy (a father of geography who is credited to draw the first map of the world), 6) Herophilus (a famous ancient anatomist and surgeon who firstly and systematically dissected human body, thus, a father of anatomy, a father of cardiology and discovered in other medical fields such as neurology, ophthalmology et), 7) Soranus (ancient physician who influenced advancement of gynaecology) and 8) Galen (great historical physician whose works were the most influential in medical teaching after the fall of Alexandria school of medicine till renaissance era).

In third century, AD, the spread of Christianity led to the fall of the school of Alexandria, and such became an obstacle to advancement of medicine, other scientific knowledge, technology, and wisdom. The school of Alexandria was active till 3rd Century AD. In 3rd Century AD city of Alexandria became a site of many revolts that were fighting against Roman pagan Rulers and other people. In 389 AD Theophilus Patriarch of Alexandria decreed and received an edict of destroying all pagan related symbols from Emperor Flavius Theodosius. In 391 AD all pagan's related symbols were burnt. Serapeum and second library of Alexandria that located underneath it and numerous books that were kept there were also burnt. That led to the loss of most of discovered knowledge. Unethically, some scientists and philosophers were also innocently killed. Hypatia was female (to inspire many current females not to fear any things including science). She is regarded as last famous philosopher and great mathematician of school of Alexandria. In 415 AD she was innocently killed because of encouraging logical thinking and promoting Mathematics. Range of period between her tragic death and beginnings of renaissance Era has been regarded as Dark ages for advancement of scientific knowledge.

The 14th, 15th, and 16th centuries mark the renaissance Era and such Era mark further progression of scientific fields including medical science because scientists managed to overcome the resistance of churches that had been an obstacle for science since the fall of the school of Alexandria and death of Hypatia. Painfully, lives of many innocent scientists ended with execution. Galileo Galilei (1564–1642) is an example of famous scientist who was executed by church because of his scientific thinking. Accordingly, scientific activities of many scientists were not about to dishonour God. For instance, Isaac Newton (1642–1727) repetitively asserted that his motivation for scientific research was the wish to probe the ways God had constructed the world and thus learn more of God's will. Regrettably, few scientists of present days are compelled by this motivation. The enthusiasm of many scientists of renaissance Era was to understand natural phenomena using experiments and observation as the basis for theoretical thought and mathematical arguments. Science and technology reciprocally began to advance. Discoveries of renaissance scientists paved many new ways for the survival of future human generations. For instance, Antonie van Leeuwenhoek (1632–1723) built a microscope and used it to identify bacteria. Though, he did not describe bacteria as cause of some diseases to humans, for all following years microscope became a powerful means of studying various diseases. Health science (Medicine) is an ever-changing science. However, during Dark Ages periods this fact was not realized. Mainly Galen's works such as anatomy remained the only accepted source of medical knowledge. Renaissance Era inspired numerous prominent physicians and scientists to discover more knowledge with an attempt of advancing the field of medicine and in turn the health of human beings. Among those include William Harvey (1578–1657), Andreas Vesalius (1514–1564) Ambrose Pare (1509-1590), Girolamo Fracastoro (1478–1553, Paracelsus (1493–1541), Leonardo Da Vinci (1452–1519) [31-32].

Despite efforts of such heroic people in terms of advancing health of human beings, uncountable horrific events that disrupted the dignity and health of some human beings happened or started before 1700s. Slavery trade is among those horrific events. It mainly targeted and negatively affected many people from different regions of Africa. Four big slavery trades affected the continent of Africa. The first three and oldest one started at least prior to 800 AD. These are: 1) Trans-Saharan, 2) Red Sea, and 3) Indian Ocean slave trades. The fourth and the biggest is trans-Atlantic slave trade which occurred between fifteenth and nineteenth century. It is estimated that

during trans- Atlantic slave trade between 12 -18 million Africans were forcefully taken away from Africa and four million died along the way. The slave's trades were unhealthy and unethical because it induced wars and conflicts between different territories while trying to capture people for trade.

Gestational Era of Healthcare Bioethics (1750 to 1947)

Between 1750s -1760s industrial revolution (IR) began in England and later it spread to other parts of the world and since then its effects have had huge influences on the health of global population. Development has been a major determinant for health since IR. Remarkably IR brought numerous positive impacts to the health of human beings. For instance, in England, social wellbeing, infrastructure and economy increased. Infant and children mortality reduced. Fertility rate increased, and thus population expanded. Cities and towns grew larger. People migrated from rural to urban areas to look for jobs [33]. However, unethically during early IR Era England systems did not promote strategies that would lead to health for all (both internally and externally). Internally, waste management was poor, overcrowding was a serious problem, and working conditions were poor, Human rights were in violation etc. Externally, England used to get raw materials for its industries from its colonies, however it did not support those colonies to develop (poverty and poor health status remained high in most of its colonies due to lack of fair sharing of benefits of resources they provided). Agonizingly, during Early IR Era, England did not allow the spread of technology and knowledge that could enhance the quality of life in other countries. Discovery of new knowledge, technology and various innovative practices influenced the possibilities of IR. IR have had huge both positive and negative impacts in all sectors.

IR did not solve most of the health-related problems rather it brought new ways for tackling them, in fact some positive and negative health problems have been linked to the impacts of IR. IR enhanced technology and in turn use of such technology in scientific health related research improved humans' survival. John Hunter, John Snow, Edward Jenner, Louis Pasteur and Joseph Lister are examples of enthusiastic investigators who used technology that resulted from IR and the findings of their discoveries have saved many lives. Few negative health problems linked to IR from the thousands include: 1) frequent occurrence of pandemic and epidemic linked to globalization, 2) sedentary lifestyle leading to non-communicable diseases, 3) promotion of unhealthy behaviours such as smoking (as tobacco industries increased), overconsumption of alcohol (a serious toxin to the brain tissues) etc. Unethically, early healthcare system did not warn people about those negative health impacts linked to IR. At least the current system has tried to warn people about those impacts, but some unhealthy behaviours have become legacy to the present people. For instance, some people (both female and male, youth, and adults, educated and non-educated, poor and rich, those from developed and developing countries) still smoke despite evidence that tobacco is very dangerous to their health. Ethical principle such as non-maleficence (do not harm) and beneficence need to be broadened in both preventive and health promotive strategies. Dangerously industrial revolution came as destroyer to the atmosphere due to release of greenhouse gases into atmosphere. Greenhouse gases refer to a set of gases in the Earth's atmosphere with features of absorbing infrared radiations and cause retention of heat inside the atmosphere. Most things have beginnings and ends. Such end might be permanent. The ends of the release of those gases into the atmosphere have become permanent abnormal climate change. The ends of abnormal climate changes have become compromised humans' health and other World's forms of life. All these create ethical dilemmas about how to blame.

Most of the horrifying events (linked to industrial revolution) in the history of human beings are World War I and II [34]. When World War I hit the world from 28 July 1914 to 11 July 1918, it took the lives of 9 million soldiers, 23 million wounded, 5 million civilians died, and more million died due to genocide. Hunger and diseases were more prevalent. From 1918 to 1920 Spanish flu pandemic took the lives of about 17-100 million people globally. World War I increased the movements of people, and such movements increased the burden of Spanish flu. World War II occurred from 1939 to 1945. It approximately took the lives of 70 -85 million people, soldiers and

mostly civilians, young and old, city dwellers and those from countryside. Moreover, lives of tens of millions were lost due to genocide, massacres, hunger, diseases. In 1945, Atomic Bomb made at Manhattan Project by various Scientists led by Robert Oppenheimer (1904-1967) under the influence of United State of America (USA) was detonated in Nagasaki and Hiroshima (Japan) [35-37]. Thousands and thousands of people perished due to such atomic bomb; but also, led to uncountable morbidity including genetic diseases for the future generations. Detonating atomic bomb in Nagasaki and Hiroshima provoked the end of World War II. Erroneously we could say that such saved many lives in case we follow consequentialism. Scientists who manufactured atomic bomb clearly knew its horrifying impacts, as Oppenheimer narrated “We waited until the blast had passed, walked out of the shelter and then it was entirely solemn. We knew the world would not be the same. A few people laughed; a few people cried. most people were silent” [37]. This shows that it was unethical to detonate atomic Bomb in Nagasaki and Hiroshima. In fact, civilians were the mostly affected group.

During World War II some Nazi doctors adopted principles of dangerous knowledge instead of useful knowledge via performing unethical experiments on human subjects [38-39]. They mainly targeted vulnerable groups such as prisoners. Examples of unethical experiments done on humans by Nazi Doctors during World War II are provided in Table 2. Not only Nazi doctors, other tragically experiments that disrespected the dignity of human beings; in fact, dishonoured healthcare and research fields are known. One example of those is Tuskegee Syphilis Study (1932-1972). Accordingly, by 1945 the whole World and dignity of its population were seriously unstable. Thus, there was a need for forming a unified organization that could reverse the history; mainly focusing on safeguarding the dignity and ensuring the attainment of optimum health status for all people globally. United Nations (UN) formed on the 24th of October 1945 became such organization. Since 1945, safeguarding human dignity in any circumstances in all sectors became a critical point. In 1947 Nuremberg trial became a pivotal point that stressed the need for respecting the dignity of all participants who involve in clinical research. Formation of UN in 14945 and 1947 Nuremberg trial mark gestational term period for healthcare bioethics.

Table 2: Examples of unethical experiments done on humans by Nazi Doctors during World War II

Experiment	Targeted Subjects	Procedure of experiment	Tragic outcomes for the subjects/comments
Low pressure Experiment	Prisoners	<ul style="list-style-type: none"> Forcefully prisoners were put into low pressure tank [40] The aim was to determine how long they could survive with insufficient oxygen 	<ul style="list-style-type: none"> Most died
High altitude Experiment	Prisoners	<ul style="list-style-type: none"> Forcefully prisoners were hanged at higher altitude [40] The aim was to determine how long live in high altitude 	<ul style="list-style-type: none"> Most died and later autopsied. Survival was put underwater till they die and autopsy proceeded
Cold Experiments	Prisoners	<ul style="list-style-type: none"> During winter (temperature - 20°C) naked prisoners were forcefully kept outside 9 to 14 hours(40). Some were forcefully kept in a bath of freezing water till death Aim was to determine how long a man can bear cold and consequences of cold until death 	<ul style="list-style-type: none"> Most died

Malaria Experiment	Prisoners	<ul style="list-style-type: none"> • At Dachau more than 1000 prisoners were forcefully infected with Malaria parasites. • Some were infected directly by mosquitoes, others injected with malaria parasite from the glands of mosquitoes [40]. • Treatment with experimental anti-malarial drugs followed. • Dr. Klaus Karl Schilling, an eminent malaria expert involved in such unethical practice 	<ul style="list-style-type: none"> • Thirty forced participants died from malaria. • More than 400 died due to complications and overdose of experimental anti-malaria drugs given to them [40].
Twins experiment	Twins' babies	<ul style="list-style-type: none"> • These were comparative studies with two groups. • Twin baby in experimental could be exposed to a pathogen and killed and then autopsied in order to determine natural progression of disease. • The other control twin was then sacrificed to see what the differences were 	<ul style="list-style-type: none"> • Babies in experimental group died of unreasonable reasons. • Babies are innocent; they could not know the benefit of any experiments. • Involving them in any study requires higher ethical standards
Epidemic Jaundice Experiments	Eight Jews of Polish resistance	<ul style="list-style-type: none"> • This study took place at Sachsen Hauser and Natzweiler camps. • Experiment began in an effort to determine an inoculation against epidemic jaundice 	<ul style="list-style-type: none"> • Torture • Deaths of participants
Incendiary Bomb Experiments	Five inmates	<ul style="list-style-type: none"> • These experiments took place in Buchenwald in 1943. • Intentionally and forcefully participants were burned with phosphorous material taken from an English bomb. 	<ul style="list-style-type: none"> • Participants were severely injured

Birth, Growth and Developmental Era of Healthcare Bioethics (1948s to 1990s)

The 1948 was a critical transitional year in regard to respecting the health and dignity of human beings because of United Nations' (UN) ambitions of optimizing the health and dignity of all people Worldwide. In 1948, World Health Organization (WHO) was established. In the same year UN issued 30 Fundamental Universal Declaration of Human Rights [27]. Moreover, in September 1948 in Geneva/Switzerland World Medical Association (WMA) released the Declaration which aimed to inspire all physicians to follow ethical standard while managing all clients. One of the excerpts from Geneva declaration reminds Doctors (health workers) to respect dignity of humans all the time, as it states all doctors must 'MAINTAIN the utmost respect for human life from the time of conception even under threat, must not use their knowledge contrary to the laws of humanity' [41]. The fact that, all these happened in same year and facts of being still active today with aim of maximizing health and dignity of human beings globally, marks 1948 as birth year of healthcare bioethics. The growth of healthcare bioethics progressed as evidenced by existence of other declarations and commitments that aimed to respect the dignity of human beings. Helsinki declaration issued by WMA in 1964 and it focuses on ethical principles regarding human experimentation and Belmont reports [42] are few examples from thousands.

Firmly, after World War II, advance of medical science and technologies together with respecting ethical standards in healthcare sectors have allowed numerous practices and programs that aim to optimize health and dignity of human beings to be possible. For instance, for many centuries, smallpox had been a deadly disease that caused different pandemics with higher morbidity and mortality in different parts of the world. Eduard Jenner was a scientist who lived from 1749 to 1823, at his time smallpox killed about 10% of global population; men and women, young and old, city dwellers and those from countryside, of which the number was as high as 20% in cities and towns due to higher infections spread. In 1796 Jenner discovered smallpox Vaccine; however, due to lack of justice, the application of such Vaccine remained in confined areas. Yet smallpox was a global issue and still in 1950s many people especially those from Africa, Asia and South America continued to perish as consequences of it [16]. In 1958, WHO began programs for eradicating smallpox using smallpox Vaccine discovered by Jenner. Due to application of justice and equitable distribution of smallpox vaccine, such program culminated into successful eradication of smallpox in 1980 [16-17].

Moreover, in mid 1950s, World Health Organization began malaria eradication program. Approach for such program was absolutely vertical via DDT insecticide distribution campaigns that took place in different parts of the world. In 1960s, evidence showed failure of such program due to its absolute vertical nature. Though, such failure stimulated various global health actors to think about the comprehensive approaches that could favour all people from the globe to enjoy the benefits of science and technologies. The cardinal actors from hundreds of actors include Dr. Ken Newell, Dr. Halfdan T. Mahler, and various doctors from Christian Medical Commission [43]. In 1970s, such approaches came to be setting of the ambitions for health for all by 2000, and establishment of primary healthcare (PHC) in 1978. Lack of enough resources, start of global HIV/AIDs pandemic in 1980s and somehow lack of maximal adoption of healthcare bioethical principles led to some feebleness in terms of implementing goals of comprehensive PHC. After launching of PHC, health related problems remained high in developing countries. Vulnerable groups including children continued to suffer. That led to the adoption of selective PHC by some actors in 1979. Mr. James P. Grant is a typical actor who adopted selective PHC in order to ethically save lives of many children who were dying in developing countries. His commitments towards respecting humans' dignity led to existence of UNICEF Declaration of Children's Revolution in 1982. Such revolution contained: 1) Growth Monitoring, 2) Oral Rehydration, 3) Breastfeeding, 4) Immunization, 5) Food supplementation, 6) Female literacy and 7) Family planning (GOBI...FFF). He later influenced existence of Bamako initiative [44] that seemed purely and comprehensively to respect healthcare bioethical principles. Unethically some public health experts opposed this initiative [44]. Today, it is known that Bamako initiative saved many children, yet its legacy has not been recognized by many.

In line with reasons for establishing PHC and health for all, it is clear that by 1970s people from all parts of the world were still unacceptably struggling with health-related problems. Technology and knowledge for tackling some of those problems were availability. Probably, among other observers, Potter observed 1) inappropriate usage of scientific knowledge and technology with respects to supporting the societies, 2) continuous sufferings of people, 3) continuous destruction of ecosystem etc. In early 1970s Potter published his paper entitled *Bioethics: The science of survival* and his book entitled *Bioethics: Bridge to the Future*. Prior to Potter's publications, different organizations such as WHO, WMA etc. had started to endorse the use of scientific facts in order to optimize humans' health and their dignity. However, there was not clearly named and defined discipline that could support people to integrate scientific facts with moral principles. Such lack inspired Potter to stress the need for a new discipline that could favour people to obtain wisdom of how to use knowledge for human survival and to improvement in the quality of life. He named such discipline *Bioethics*. Later the growth and development of bioethics dramatically increased as evidenced by the fact that different reputable organizations honoured and accepted bioethics as new discipline. Among the organizations that endorsed the concepts of bioethics in 1970s include: Kennedy Institute of Ethics at Georgetown University, 2) Hastings Centre, 3) UNESCO and plus others. With respect to bioethics the primary meeting of UNESCO occurred

in 1975, in Varna/Bulgaria, and its main theme was to reflect on the relation between ethics and (molecular) biology [24]. For the proceeding years UNESCO continued to honor the discipline of bioethics. Its activities, scientific conferences and symposium have influenced the growth and development of bioethics until today.

Maturity (But Not Elderly) Era of Healthcare Bioethics (1991 to Present)

By 1991, the discipline of bioethics was well known, its main goal of respecting all forms of life on the earth remained critical. In 1991s the world was nearly entering into new millennium. By 2000 the world entered into new millennium with unfinished businesses. Among others, attaining health for all was still an issue. Millennium development goals ambitions to be achieved by 2015 were proclaimed [45-46]; but this was erroneous description in terms of timing because the millennium that started in 2001 will end by 3000. By 2015 the world still had unfinished businesses [47]. Poverty, hunger, no health for all, no education for all, inadequate gender equality, abnormal climate change etc. were still in existence. All these provoked extensions of 8 millennium development Goals to 17 Sustainable development Goals with 169 targets. Evidence indicate that since 2015 many nations have been making progress in terms of achieving SDGs. However, Covid19 pandemic and other constraints including Russia–Ukraine conflicts and war interrupted all processes designed to support people to gain optimal health status and prosperous lives. Momentously, over the years science and technology continued to advance. Reciprocally, all these brought various ethical dilemmas. Bioethics has remained as a core discipline that would help to tackle all those ethical dilemmas. Millennium Development Goals will remain critical till 3000. The first 15 years (2000-2015) and other 15 years of SDGs (2015-2030) should be regarded as pilot years of probing strategies that will support to implement millennium development goals. What does this fact tell bioethicists and other various stakeholders? The answer is found in one the aims of article 2 of the Universal Declaration on Bioethics and Human Rights as it proclaims we must ‘safeguard and promote the interests of the present and future generations’ [48-49] all the time, in all means and in all actions.

To ensure highest level of human rights, dignity and health status have been critical targets for many nations and international organizations. UNESCO has put bioethics on its heart as means of ensuring respects to human rights and dignity. Its interests in bioethics started in 1970s [24,29]. In 1990s UNESCO expanded its scopes via becoming a core UN organization in Bioethics and Ethics of Science and Technology [50]. In 1991 “UNESCO's Division of Human Rights and Peace, together with the USSR Academy of Science and the USSR Academy of Medicine, held an international bioethics conference in Moscow May 13-15, 1991. Twenty participants from the United States, Europe, Asia, and South America participated”. Since then, UNESCO continued to expand its scopes with respect to bioethics and it has issued various reports and declarations shown in Figure 2 that demonstrate its interests in the discipline of Bioethics. Three global declarations namely: 1) the Universal Declaration on the Human Genome and Human Rights (1997), 2) the International Declaration on Human Genetic Data (2003) and 3) the Universal Declaration on Bioethics and Human Rights (2005) are the cardinally remark of its interests in Bioethics. Not surprisingly WHO also has put Bioethics on its heart as evidenced by existence of Global Network of WHO Collaborating Centres for Bioethics. Considerably, all these have brought recognition of the discipline of Bioethics universally. Thus, maturity Era of healthcare bioethics (Bioethics) because of such worldwide recognition, but not elderly Era because despite being recognized worldwide some of its principles are still in early implementation stages and the fact many countries do not have institutes responsible for teaching and overseeing activities of bioethics.

Painfully, until now, no realization has been made by global communities that bioethics is life for all. Life for all cannot be possible if there is no proper ecosystem and suitable climate. Over the years various eminent actors of the World have wished the attainment of health for all. Truly, Health for all cannot be possible if there is no life for all. In point health for all should be regarded as subset of life for all (Bioethics). The main goal of health for all was to support all people globally

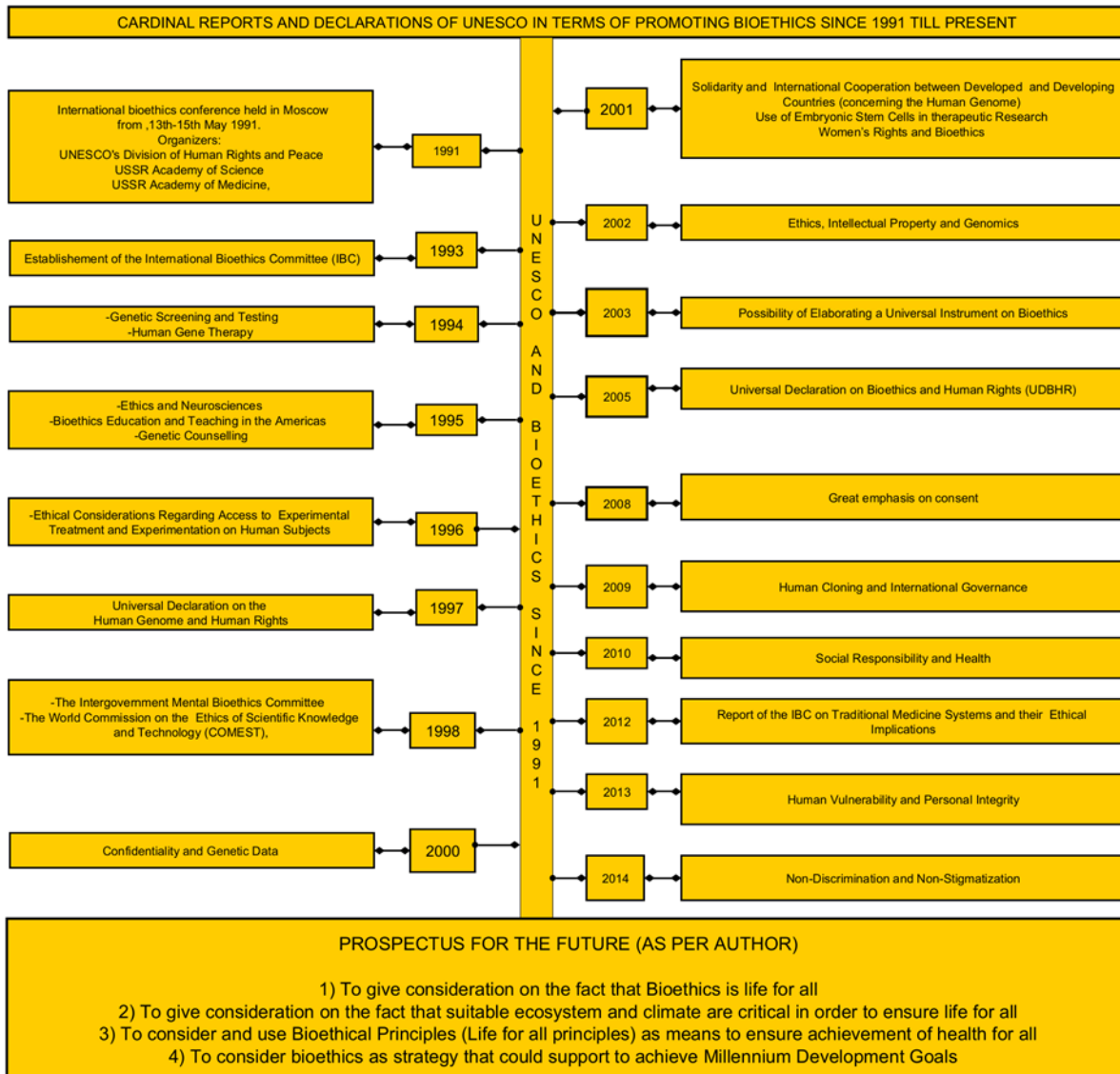
to gain highest level of dignity and health status. To achieve health for all is still relevant agenda for the present days as recognized by WHO, in fact, the main theme of recent 76 WHO General Assembly (21st May to 30th May 2023) included the word health for all. If one thinks properly, one of the applications of the principles of bioethics must be to support the implementation of all goals and principles set in health for all ambitions and other ambitions. Ethical principles namely non-maleficence (do not harm), beneficence, autonomy, and justice must broaden and utilized in all sectors. Ethically, all worlds' people should not adopt anything or behaviours that are likely to harm their health rather they must promote those one that are likely to promote their health (beneficence). Do not harm principle should be used to promote peace comprehensively worldwide. Do not harm is critical principle to use for avoiding conflicts between individuals, conflicts and wars between groups, communities and countries. Do not harm principle should be used to empower people to stop doing activities that destroy ecosystem and those that lead to abnormal climate change. Beneficence must be used in terms empowering people to maximally use timely climate adaptation strategies. The end of all scientific activities and technologies must be to support the progression of life for all living things in shared appreciation of one living things to another. Scientific knowledge and technology should not be used with purposes of harming humans' health and destroy ecosystem. Following these ethical standards will support to implement health for all agenda and other ambitions including Sustainable development goals.

Conclusion

After comprehensive review and synthesis of the literature presented in this paper my conclusions are as follows:

1. With regard to the history of Healthcare Bioethics all periods (B.C., A.D. to 1749s) prior to beginnings of industrial revolution, should be termed as Preconceptional Era of Healthcare Bioethics because the usage of ethics in health care existed however, there were minimal utilization of scientific knowledge and technologies in healthcare sectors.
2. With respect to the history of healthcare bioethics, the period between the beginnings of industrial revolution (1750s-1760) till 1947s should be labelled as gestational era of healthcare bioethics. Because, despite enhanced invention of scientific of knowledge and use scientific knowledge and technologies in healthcare sectors, several scandals, wars, conflicts and scientific activities that disrespected the dignity and health of human beings and some destroyed bionetworks of which life would be maintained were more apparent. They were done intentionally by various people including health related scientists. Those people were the promoters of dangerous knowledge as they adopted unethical practices. Firmly, what happened during this era became the motives for the establishment of the discipline of bioethics. Thus, in turn healthcare bioethics.
3. Regarding the history of healthcare bioethics, the period between 1948s to 1990s should be recognized as birth, growth and developmental era of healthcare bioethics because since 1948 various commitments that aimed to respect the dignity and health of human beings have been taken, Science and use of technologies in health care setting have dramatically increased and bioethics as new discipline with several institutes related to it were established. But during this era, no global declaration linked bioethics in terms of respecting the dignity and health of human beings had been taken.
4. The period from 1991 to present should be acknowledged as maturity (but not elderly) Era of healthcare bioethics. Maturity due to UNESCO adoption of three global declarations linked to Bioethics. Respecting human rights, dignity and health of all humans are critical concepts in those declarations. Not, at elderly level due to the fact that, all world's countries have not adopted all principles asserted in those declarations. Yet ethical dilemmas related to health are ever increasing worldwide. Most countries do not have institutes related to bioethics. As such teaching of bioethics is still suboptimal globally. Promoting the usage of ethical principles in healthcare sectors is very critical. There is a need for recognizing bioethics as life for all. Such recognition will support in terms of attainment of health for all and protection of ecosystem.

Figure 2: Showing reports and declarations related bioethics issued by UNESCO demonstrating its cardinal interests in discipline of bioethics



5. Finally, Healthcare Bioethics is very important and has long history. It should be listed among the recognized branches of bioethics. However, after numerous searches on various internet sources, it was found that no published literature thoroughly describing Healthcare Bioethics, what is available is just a mention of healthcare bioethical principles. It was also recognized that some authors misuse terms such as clinical bioethics, medical ethics, and biomedical ethics etc. as if they are equal to healthcare bioethics. UNESCO and other health related organizations such as WHO should recognize Healthcare Bioethics as a branch of bioethics. Principles of bioethics must be integrated in all healthcare sectors. Thus, forming healthcare bioethics. Accomplishing that would support to eradicate or minimize several of the ephemeral and heuristic approaches which are still hindering the attainment of optimum health status for the global population. Author is currently working on the paper entitled HEALTHCARE BIOETHICS: Its Description, Its Branches, Its Core Principles, Its Functions, Pre-Standard and Standard Practices in Healthcare Bioethics, with a hope that, it will serve as roadmap for establishing and recognizing healthcare bioethics as branch of bioethics.

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