Modern Insights into the Policies affecting Public Health in the Islamic Caliphate (622CE – 1258CE)

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Abstract

Background/aim:

In the Western world, the emergence of historical research on the effects of the social determinants of health has provided the discipline of public health with new insight into this aspect of population health complementing the more traditional focus on the history of medicine. The Islamic Caliphate was a dominant power in its time and little is known about its public health history. This thesis aims to provide a chronologically historical account of the policies taken in this period and analyse them in the light of modern theories of public health.

Materials and Methods:

This thesis employed a qualitative research technique. Known primary and secondary historical sources were examined and data translated and presented in a chronological order. Modern historical sources analysing the historical accounts of that era were also used. Policies affecting health were retrieved and analysed using modern day research into the same policies.

Results:

The analysis has resulted in a revisionist argument that policies affecting public health in a positive way did exist in a sophisticated manner in the Islamic Caliphate albeit in an inconsistent manner. The study complements the works of medical historians who identified a "Golden Age" in the later era of the Caliphate with advancements in medical science with a potential "Golden Age" in the early era related to the social determinants of health.

Conclusion:

This thesis provides for the first time a chronological study of policies affecting public health in an era of public health history that has not been studied before. In addition it provides for the first time a modern analysis of these policies.

Acknowledgements

I would like to thank my Supervisors, Professor Walid El Ansari and Dr Malcolm MacLean who for the last few years have guided the development and indeed evolution of this work. Their patience, experience and flexibility made this work finally come to an end. Their expertise in both public health and historical research especially in welfare systems was invaluable in the research process that yielded the results in this thesis.

In addition, I would like to acknowledge the work of two modern scholars whose work helped immensely in the development of this thesis.

Dr Ali Mohammed Salabi is a modern Arab Historian who has written several works on the history of the Islamic Caliphate. Dr Salabi's monumental works were instrumental in the data retrieval used in this thesis. Not only did Dr Salabi's work provide a historical analysis of the Caliphate but helped provide the student with several of the medieval sources and indeed modern analytical and historical works that are present with us today for further referencing and citations. In many of the references of the historical sections, where a second reference is placed after Salabi's work, it is usually a reference that he himself has also cited.

Dr S Hasanuz Zaman is a modern Islamic Economist who has written on the Economic functions of an Islamic State with special emphasis on the early Islamic Caliphate. His PhD on the same topic was submitted to the University of Edinburgh. His work served as guidance in this thesis with regards to methodology and historical sources.

Finally, I would like to thank my wife Mrs Shaimaa Elshorkobaly who is also a specialist in Linguistics and Interpretation especially between the Arabic and English Languages. Her moral and specialist support are acknowledged and for her unparalleled dedication to her family and her commitment to their education, I dedicate this work.

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Chapter 1: Introduction

In this Chapter the following topics will be covered:

1. The relationship between public health and social welfare
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5. Medicine in the Arabian Peninsula

1.1 Public health and social welfare – modern and historical context:

In recent times, public health experts have recognised the impact of social welfare on the health of individuals and society. Public health is no longer restricted to delivery of medical care or control of infectious diseases. Indeed the WHO reviewed its definition of health as

> "a complete state of physical, mental and social well-being, and not merely the absence of disease or infirmity"(WHO, 2003b).

Thus public health experts seek to improve all these aspects in order to improve the health of society. These aspects are directly related to national policy and the politics of government.

The inter-relationship between public health and politics is complex. Health systems are regarded as open systems subject to the effect of non-medical factors including peace, general education and the economy. Good communications, media and even mechanisms of transportation can have significant effects on the overall health of society.

The World Health Organisation thus defines a health system as:

> "A health system consists of all organizations, people and actions whose *primary intent* is to promote, restore or maintain health. This includes efforts to influence determinants of health as well as more direct health-improving activities. A health system is therefore more than the pyramid of publicly owned facilities that deliver personal health services. It includes, for example, a mother caring for a sick child at home; private providers; behaviour change

programmes; vector-control campaigns; health insurance organizations; occupational health and safety legislation. It includes inter-sectoral action by health staff, for example, encouraging the ministry of education to promote female education, a well-known determinant of better health"(WHO, 2007).

Taking the above argument further, to confine public health simply to the delivery of medical care to the sick is no longer accepted by modern day public health experts. In 1986, the WHO convened a conference on health promotion in Ottawa that ended in the release of a Charter. The WHO Ottawa Charter provided nine social determinants of public health (WHO, 2014c) . These are:

1. Peace
2. Shelter
3. Education
4. Food
5. Income
6. A stable ecosystem
7. Sustainable resources
8. Social justice
9. Equity

These social determinants of health would later influence Government policies especially in the developed world. The scope of public health itself would change from simply the control of communicable diseases and preventive medicine to include health promotion, health maintenance, health systems management and health care policy. Indeed the UK Faculty of Public Health defines public health as:

"the science and art of promoting and protecting health and well-being, preventing ill-health and prolonging life through the organized efforts of society"(FPH, 2010)

Furthermore, the WHO now emphasises on the term "healthy public policy" where all Government departments and societal sectors are integrated with the aim of assessing the effect of any policies on health (WHO, 2014a).

Thus the way public health history would be viewed or studied would in itself change to include many of these aspects. The field of public health history is no longer confined to the history of sanitation and communicable diseases. Furthermore any modern day study of the history of public health should also incorporate the social determinants of health as well as welfare systems and their impacts on the population health. Hence in this study "the organised efforts of society" described in the above definition would be applied to gain more insight into the potential effects on population health as a result of policies taken by the Caliphate.

The history of public health should not be confused with the classic narratives of history of medicine. Most works on the history of medicine confine themselves to the discovery of certain curative techniques or the causative factors of disease. Some include the delivery systems (for instance hospitals) in their study of the medical history. With regards to public health, this is only a part of the whole story. In the 19th century and early 20th century, most public health historical researches concentrated on sanitation and infectious diseases (Porter, 1999, pp 1) ignoring the effect of poverty and lack of education and social infrastructure on the health of individuals. Thus the history of public health in its present holistic approach is a relatively new field with only few studies.

The medieval period poses a major problem for the historical researcher of public health. Most studies concentrate on the medical aspect of disease with little emphasis on social, mental and spiritual aspects. Again emphasis is placed on the medical care of the sick, sanitation and infectious diseases. The effect of national policies in most of the medieval societies and their anticipated effect on the health of society have received little attention.

The medieval Muslim world is no exception to this dilemma. The medieval Islamic period has always been of interest to modern day scholars. The Golden Age of Islam usually refers to the civilization that existed in Muslim lands prior to the European Renaissance. Western scholars have long being fascinated by the scientific developments that happened in medieval Islamic times and their effect on later European civilisations.

A tremendous amount of research has been done in the field of Islamic medicine but little is known about public health and the policies made in the era of the Caliphate. The term "Islamic Medicine" itself is difficult to define and no agreed definition exists between scholars. Generally, it refers to the practice of medicine during the golden age of Islam (Pormann and Savage-Smith, 2007, pp 6). Fortunately, a lot of the writings of medieval Muslim physicians have survived till today. The medical methods, disease classification and treatment have been analysed by modern scholars. The works of medieval Muslim scientists such as ibn Sina (Avicenna), Razi (Razes) and Ibn Rushd (Avores) to mention but a few have received particular attention and research in recent times (Amr and Tbakhi, 2007, pp 305 - 307). However little is known on the public health policies and systems in the Caliphate of Islam, their origins, development and their effect on the health of the population of the time. Western historians seem oblivious to this aspect of public health history in that era. Their eastern counterparts are no less guilty. Before going further, the next section gives an overview of the era under study.

1.2 The Islamic Caliphate:

The Caliphate of Islam was a State that based its constitution on the revelations given to the Prophet Muhammad that spanned the 23 years between 610CE and 632CE. In the basis of this constitution, the Lawgiver here is God and transmission of the revelations was through the Prophet Muhammad. The Qur'an is regarded as the revealed book of the religion where the unadulterated and unedited revelations given to the Prophet are contained. The actions of

the Prophet Muhammad in his religious capacity as witnessed and transmitted by his companions are known as the Sunnah. These actions and his sayings (known as the Hadith), together with the Qur'an, make up the basis of the Islamic constitution also known as the Shariah. Despite misconceptions, this law actually covers all aspects of life. Islamic Jurisprudence (also known as Fiqh) is a dynamic aspect of Shariah with great flexibility as dictated by the principles of the Qur'an and the Traditions.

The Islamic State discussed in this thesis started with the rule of the Prophet Muhammad in the city of Medina in 622 CE. Following the death of the Prophet in 632CE, the Islamic State continued as the Caliphate of Islam. The head of state or the Caliph and his ministers/governors represent the executive arm of the state. The word Caliph means "vicegerent". The word is used in the Qur'an to describe the role of the first man created (Adam) on earth as designated by God:

"Behold, thy Lord said to the angels: 'I will create a vicegerent on earth"(Qur'an 2:30)

In the context of the Caliphate, the Caliph is responsible for applying the Law of the State as prescribed by the Qur'an and the Traditions and derivations from Islamic Jurisprudence.

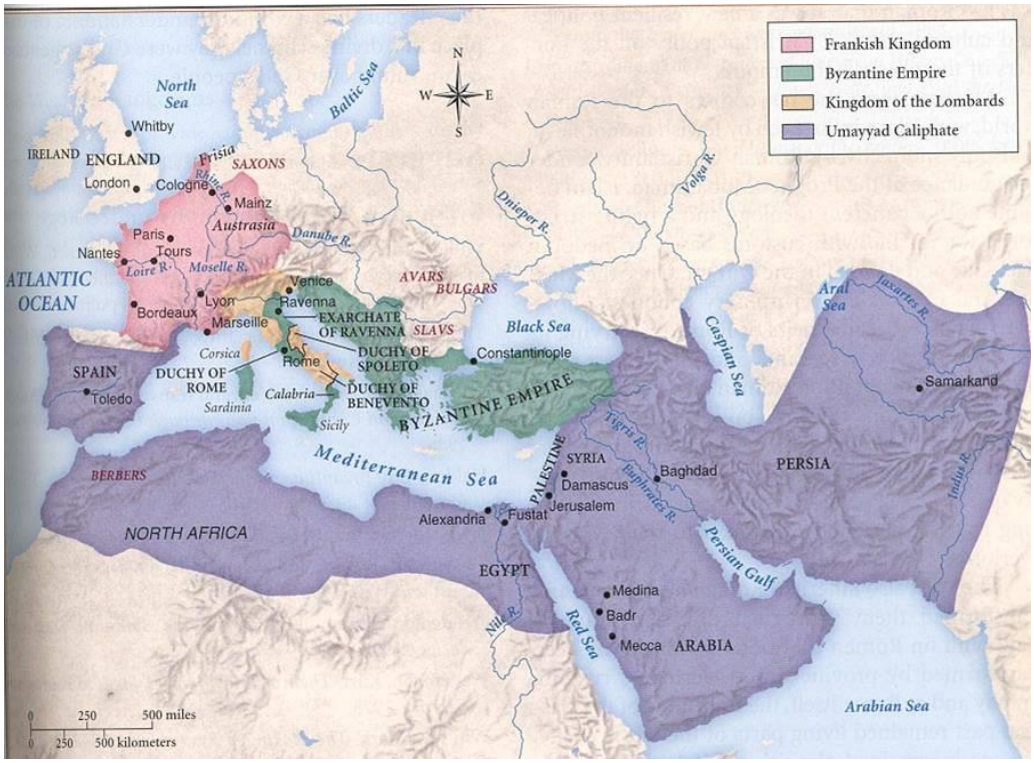
According to Ibn Khaldoun, the renowned medieval historian and sociologist, in his "*Introduction*" to world history, the Caliphate applies the rules of the Lawgiver for the preservation of the faith and the governing of the wordly affairs (Ibn-Khaldoun, 2004, pp 244)

The Caliphate started from the Arabian Peninsula which had come under the political control of the Prophet by the time of his death. Within a decade of his death, his companions expanded the Caliphate to include the Persian Empire and much of North Africa through rapid military expansions into lands controlled by the Byzantine empire (Jackson, 2006, pp 15). Within a century of his death, the Caliphate had well expanded into Asia Minor and into

Western Europe taking what is today known as Spain and Portugal. Figure 1 shows the map of the Islamic Caliphate at its peak (during the Ummayad period).

Figure 1: Map of the Islamic Caliphate (From

http://nogalesapworldhistory.wikispaces.com/Southwest+Asia Accessed 26/3/2014)



By the middle of the 7th century CE, the Caliphate had become a major ruling force of its time. It was obviously cosmopolitan in nature with several populations now coming under a single rule. These populations brought with them their own cultures, civilizations, languages, sciences, arts and literature within its borders. The Caliphs, their ministers and governors acted as political administrators of this complex cosmopolitan environment applying the principles of Islamic Law to run the affairs of the State albeit in different degrees of accountability and transparency across the centuries.

Many Caliphs acted as patrons of the sciences and the arts and an environment of religious and cultural tolerance existed especially in the first few centuries (Alexakos and Antoine, 2005, pp 36 - 39). By the 9th century CE, the medieval Islamic civilization had reached its peak heralding the Golden Age of Islam. However by the middle of the 11th CE century, a steady decline in the Caliphate occurred (Hindley, 2007, pp 24). Several states had effectively broken away from the Central government then situated in Bagdad (in present day Iraq). By the late 12th century the Caliph of Baghdad was simply a nominal head of state. Incursions by external armies only helped to weaken the Caliphate. Whilst the crusaders were beaten by Saladin in the late 12th century (Hindley, 2007, pp 14), the mere fact that Saladin who then was Sultan of Egypt acted almost unilaterally in his war against the crusaders shows the fragmentation of the Caliphate in the last century of its existence. Sure enough, 66 years after Saladin's death, the Mongol army under Hulagu (grandson of Genghis Khan) attacked Baghdad in 1258 CE and literally destroyed the city killing the last Caliph Al Mustasim (Amitai-Preiss, 1996, pp 487- 494). The libraries of Baghdad were burnt down and the books (literally in hundreds of thousands) were thrown into the Tigris River.

The world lost a treasure of knowledge in that invasion. Luckily however, some Muslim states successfully resisted the Mongol invasion. Egypt defeated the Mongol Army at Ayan Jalut in 1260CE thereby protecting the rest of North Africa from the Mongol onslaught

(Amitai-Preiss, 1996, pp 487 - 494). This helped preserve some of the details known today of that era of Muslim history. However the Abbasid Caliphate effectively ended in 1258CE.

Historically, the first 6 centuries of Islam are divided into 4 :

1. The era of the Prophet Muhammad (The Prophetic era): 622CE – 632CE
2. The Caliphate of the Righteous Four: 632CE – 661CE
3. The Ummayad Caliphate: 661CE – 750CE
4. The Abbasid Caliphate: 750CE – 1258CE

The following sections will briefly provide a descriptive narrative of what is commonly known in the Muslim world with the three periods known as the Islamic Caliphate after the death of the Prophet Muhammad as reported by historians.

1.2.1 The era of the Righteous Four:

These were four companions of the Prophet Muhammad. They were well known for their religious piety, faith and steadfastness to the rules of the religion hence the title "Righteous". These four were Abu Bakr, Omar ibn Al Khattab, Uthman Ibn Affan and Ali ibn Abi Talib. These companions are regarded as the builders of the Islamic State after the Prophet. They will be discussed later in the body of the thesis. Their capital was the city of Medina.

Their era spanned from 632CE after the death of the Prophet till 661CE when the fourth caliph was assassinated. The welfare programmes in the Caliphate had their foundations during the period of these 4 rulers.

The ascension of these rulers was through the process of consultation (known as Shura) amongst the surviving companions of the Prophet.

1.2.2 The Ummayad Caliphate:

With the end of the Righteous Four era, the next 91 years showed a hereditary passing of power within the Caliphate. All the Caliphs in that era came from one clan called the Ummayad clan. This clan originally from Mecca was a powerful clan in the pre-Islamic era. The Ummayad Caliphs passed on power to their family members in a succession process. This was quite different from the era of the Righteous Four as described in the previous section. The Ummayad rule saw a huge expansion of the Islamic Caliphate. Fourteen Caliphs (Table 1) ruled in succession during that era and some will be discussed in this thesis in appropriate sections. They moved the capital from Medina to the city of Damascus in Syria.

However, its 91 year rule was plagued at several times with internal and external unrest. Towards the end, an uprising toppled the last Ummayad Caliph and killed him and most of the members of the Ummayad family. However a remnant of the Ummayad family escaped to Andalusia (present day Portugal and Spain) which had been under Caliphate rule. They formed an Emirate in Andalusia which was independent of the rest of the main Caliphate. That Emirate would later become the Caliphate of Cordoba. The uprising brought the Abbasid Caliphate into being. The Caliphate of Cordoba and its Emirates in Andalusia are not discussed in this thesis as they were not subject to the rule of the Abbasid Caliphs.

Table 1: Ummayad Caliphs and their period of rule (Khan, 2008, pp 15):

Ruler	Period of Rule (in CE)
Muawiyah ibn Abi Sufyan	661 – 680
Yazid I ibn Muawiyah	680 – 683
Muawiyah II ibn Yazid	683 – 684
Marwan I ibn al-Ḥakam	684 – 685
Abd al-Malik ibn Marwan	685 – 705
al-Walid I ibn Abd al-Malik	705 – 715
Suleiman ibn Abd al-Malik	715 – 718
Umar ibn Abd al-Aziz	717 – 720
Yazid II ibn Abd al-Malik	720 – 724
Hisham ibn Abd al-Malik	724 – 743
al-Walid II ibn Yazid II	743 – 744
Yazid III ibn al-Walid	744
Ibrahim ibn al-Walid	744
Marwan II ibn Muhammad	744 – 750

1.2.3 The Abbasid Caliphate:

The Abbasid Caliphate is so called as all its rulers came from the lineage of Al Abbas, the uncle of the Prophet Muhammad. The members of this family led the uprising against the Ummayads and came to power. They continued the Ummayad tradition of hereditary succession. Thirty seven Caliphs ruled for the following 500 years in what would become known as the "Golden Age" of Islamic civilisation. The Abbasids moved the capital from Damascus to Baghdad in Iraq. Most of the discoveries in the Islamic Period in all the major sciences were done during the Abbasid era.

However in the last two hundred years of this era, uprisings were common with several breakaway states. One such state was the Fatimid State which took large areas of the Abbasid Caliphate including Egypt. The Fatimids declared a Caliphate of their own which spanned 262 years ruling with the statutes of the Shia sect. This State was however brought to an end by Saladin who returned the lands back to Abbasid rule albeit nominally. The Fatimid dynasty is not discussed in this thesis as it is outwith the jurisdiction of the Abbasid Caliphate. Incursions by the crusaders only helped weaken the central authority of the Abbasids even though Saladin finally defeated the crusader armies. In 1258 CE, the Mongols sacked Baghdad killing the last Abbasid caliph and effectively ending the Caliphate. Table 2 shows the list of the Abbasid Caliphs and their period of rule in CE.

Table 2: List of Abbasid Caliphs and their period of rule (In CE) (Khan, 2008, pp 16 – 17)

Ruler	Period of Reign (in CE)
As Saffah	750 – 754
Al Mansur	754–775
Al Mahdi	775–785
Al Hadi	785–786
Harun Al Rashid	786–809
Al Amin	809–813
Al Ma'mun	813–833
Al Mu'tasim	833–842
Al Wathiq	842–847
Al Mutawakkil	847–861
Al Muntasir	861–862
Al Musta'in	862–866
Al Mu'taz	866–869
Al Muhtadi	869–870
Al Mu'tamid	870–892
Al Mu'tadid	892–902
Al Muktafi	902–908
Al Muqtadir	908–932
Al Qahir	932–934
Al Radi	934–940
Al Mutaqi	940–944
Al Mustakfi	944–946
Al Muti'	946–974
Al Ta'i	974–991
Al Qadir	991–1031
Al Qa'im	1031–1075
Al Muqtadi	1075–1094
Al Mustazhir	1094–1118
Al Mustarshid	1118–1135
Al Rashid	1135–1136
Al Muqtafi	1136–1160
Al Mustanjid	1160–1170
Al Mustadi	1170–1180
Al Nasir	1180–1225
Al Zahir	1225–1226
Al Mustansir	1226–1242
Al Musta'sim	1242–1258

1.3 Medicine Prior to Islam:

Prior to researching the public health systems and policies of that era, it is important to look at the history of medicine as described in traditional historical works as both aspects are complementary to each other. A complete history of medicine or even health prior to the Islamic era is beyond the scope of this thesis. However a bit of background knowledge is essential in understanding the developments that occurred in the Islamic era. Right from the onset of recorded history, medicine has been central to all ancient civilizations.

The Ancient Egyptian civilization earned itself a reputation in the field of medicine. However even in Ancient Egypt, little distinction was made between the spiritual and the physical. Training in the field of Medicine in Ancient Egypt is thought by many to have occurred in Temples. Indeed treatment in ancient Egypt comprised both physical treatments and magical verses on the same prescription (Saber, 2010, pp 327 - 334). The Ancient Egyptians undoubtedly excelled in areas of physical illness including suturing of wounds and repair of fractures. Indeed the Kocher's technique of reduction of a dislocated shoulder in reality has been shown to be an ancient Egyptian technique depicted in several drawings in ancient Egyptian monuments (Hussein, 1968, pp 669 - 671).

Many of the physicians of Ancient Egypt were in themselves priests and just as training occurred in Temples, treatment of the sick also occurred in Temples combining spiritual, magical and physical therapies (Subbarayappa, 2001, pp 135 - 143). However a systematic dispensation of health services or a welfare system remains unknown.

The Indians also had their share of medical development. One of the world's most ancient medical documents is attributed to the legendary Indian surgeon Sushruta who lived over three thousand years ago. In it several plastic surgical techniques are elegantly described including rhinoplasty and use of forehead vascularised flaps which are used till this day

(Tewari and Shukla, 2005, pp 229 - 230). Sushruta appears to have had his own school as well:

> "The followers of Sushruta were called Saushrutas. The new student was expected to study for at least 6 years. Before starting his training he had to take a solemn oath, which can be compared to that of Hippocrates or Maimonides. He taught the surgical skills to his students on various experimental modules, for instance incision on vegetables (like gourd, watermelon,cucumber), probing on worm eaten wood, etc."(Tewari and Shukla, 2005, pp 229).

The Indians also developed their own medicines and potions for the treatment of several diseases. Again no known organised state run system was in place for the development of a health service in the ancient Indian civilization.

Just north of India, the massive Chinese empire developed its own civilization. The Chinese excelled in the production of medications and several other methods of medical treatment including anaesthesia (Wong and Wu, 1932). Ancient Chinese medicine interestingly also looked at psychiatric illnesses and hysteria, psychosis and depression appear in ancient manuscripts (Tseng, 1973, pp 569 - 575). So advanced were the complex Chinese medications that recent research into their pharmacological content has shown to some extent that the combinations do have sound scientific basis (Jia et al., 2004, pp 681 - 686).

Perhaps the most influential civilization with regards to the development of medicine was the Greek civilization. The father of Medicine Hippocrates born about 460BCE would influence medical practitioners for centuries to come (Goldberg, 2006, pp 1 - 2). His observations on medicine and his treatment of patients formed the foundations of Greco-Roman medicine. He laid down many of the modern day ethics of medical practise and the

well-known Hippocratic Oath is still used today in many countries to swear in qualified doctors.

Greek philosophers like Aristotle and Socrates incorporated medical science into their philosophical writings and medicine was taken to a higher frontier by the Greek philosophers to the extent that centuries later the learning of philosophy was a pre-requisite to becoming a medical practitioner.

After the collapse of the Greek empire that followed the death of Alexander the Great in 325 BCE and the division of his empire into several states, it was the turn of the Roman Empire and its rival state – the Persian Empire. The Romans were really the inheritors of the Greek civilization. Medicine again developed under the Romans. The rise of the great Greek physician Galen during the Roman period had huge impact on the development of medical sciences for the coming centuries. Galen's discoveries and monumental writings went unchallenged for almost a millennium. From diabetes (Henschen, 1969, pp 190) to nephrology (Eknoyan, 1989, pp 66 - 82), Galen's works formed the foundation for later Muslim physicians.

The Persians however in the eastern part of the globe had their own medical developments. The most prestigious centre of medical learning in the pre-Islamic era was the teaching institution in Jundishapur in ancient Persia. This renowned school taught medicine in an organized fashion and produced several doctors that worked in the vast expanse of the Persian Empire. The school was directed at some time by Nestorian Christians (Soylemez, 2005, pp 22). Several conflicting opinions exist on whether the school had an attached teaching hospital to it (Pormann and Savage-Smith, 2007, pp 20). However it is generally agreed that the school did have a high reputation in the teaching of medicine. Again the role of the state in providing health care to the masses appears absent.

Thus in summary, prior to the Islamic era, the Ancient Egyptian, Indian, Chinese, Greek, Roman and Persian medicines developed almost independently of each other. There was very little continuity of medical knowledge except for perhaps the Greco – Roman civilization. All these empires spoke different languages and thus passing knowledge from one civilization to the other would have been very minimal. None of these empires had a known organised state run health system.

1.4 Medicine in Arabia in the Pre-Islamic era:

Whilst the Arabs may have allied themselves to one civilization or the other, the arid and harsh conditions of the Arabian deserts made it unattractive to methods of direct rule under the ruling empires. Thus the Arabs benefitted little from medical developments of the empires around them. Such was the situation at the time of the Prophet of Islam. No medical developments and no organised welfare system existed in the Peninsula. As Manfred Ullman stated:

> "the state of health of the Bedouin and the urban dwellers must have been very bad"
>
> (Ullmann, 1978, pp 1).

Oppression, lack of social equity, ignorance and lack of clean water as described by historians of that era simply meant that the overall health of the population in the Peninsula was poor. Indeed the companions of the Prophet Muhammad after the rise of Islam called this era "the Period of Ignorance" or the "Jahiliyyah" period (Al-Mubarakpuri, 2002, pp 59). Yet, as historians relate, it was this Peninsula and its dwellers who after the rise of Islam, created a civilisation that contributed immensely to the European renaissance in almost all fields including medicine (Al-Djazairi, 2005, pp 12).

Thus the following are the aims and objectives of this research:

1. **To find out if there were any social policies that affected public health in the era of the Islamic Caliphate:**

   The historical chronicles in addition to the work of modern day historians will be consulted and any policies that affected public health either directly or through social welfare that are identified will be included in this research

2. **To provide a chronological order of these policies and the events surrounding them:**

   The data will be presented as a historical narrative in chronological order in accordance with historical research. To add more validity to the data, all significant historical events that either led to the policy or affected the policy will be included in this research.

3. **To analyse these policies in the light of modern day knowledge of public health:**

   All policies identified will be analysed using similar scenarios or health care policies developed in the modern world. The comparisons would be used as a tool to determine the possible effect of the policies in the medieval period on the health of the population at the time

The next chapter looks at the Literature Review of existing knowledge of medical practice and public health in the era to be studied.

Chapter 2: Literature review

In this chapter:

1. The scope of Public health history and the history of medicine in the Caliphate will be introduced
2. An introduction to the Translation movement will be provided
3. Existing knowledge of Public health in the different eras will be summarised
4. An introduction to modern public health history scholarly works

2.1: Introduction to the scope of Public Health history and the history of Medicine in the Islamic era:

The history of public health has evolved as a discipline in its own right in recent years. Inter-wined with the history of medical practice, public health history as a discipline now looks at the role of government, religion and social welfare in addition to all aspects that may influence the health of a population. This outlook is relatively new with several treatises now addressing these aspects of public health history.

The Caliphate of Islam in the pre-renaissance period led the world in almost all forms of knowledge including medicine, astronomy and the arts. The magnificent architecture of Islamic buildings still survived till today including the Ummayad Mosque in Damascus (Fig 2) and the dome of the rock in Jerusalem (Fig 3). As seen from the last section, the Islamic Caliphate conquered the Persian Empire and went as far east as India and southern China and as far West as present day Spain and Portugal. The combined Persian, Chinese, Indian, Hellenist and Greco-Roman medicine was now within reach of the Caliphate.

Fig 2: The Ummayad Mosque in Damascus (Completed in 715CE) (From: http://reflectionseurope.com/gallery/Syria/reflectionseurope_com_Umayyad_Mosque_Damascus_Syria Accessed 07/09/15)

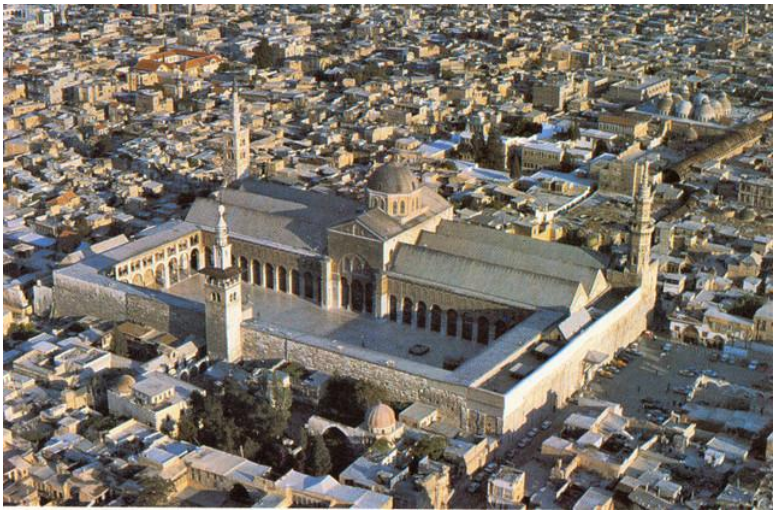


Fig 3: The Dome of the Rock in Jerusalem (Completed in 691 CE) (From: https://en.wikipedia.org/wiki/Dome_of_the_Rock Accessed 07/09/15)

2.2 The Translation movement:

Medieval scholars and scientists within the Caliphate translated from various works. As the translation movement began several medical works were translated into Arabic. Physicians were now enriched with encyclopaedias from previous civilisations with regards to medicine. As the knowledge evolved, medieval physicians now added their own experiences, observations and theories to medical practice as is seen in the works of Ibn Sina (Pormann and Savage-Smith, 2007, pp 50).

The translation movement appears to have started as early as the first Caliph of the Ummayad period Muawiyah (Salabi, 2005d, Vol 1, pp 240; El-Najjar, 2001, pp 1717).

The Abbasids established centres of learning called "Houses of Wisdom" that encouraged education and specialisation. As will be shown later, the early part of the Abbasid era produced renowned translators of Greek and Persian works. Most doctors in that early period would have learned Greek to understand the manuscripts that were before them.

2.3 Public Health and the Prophetic era:

The medieval scholars of the traditions of the Prophet recorded his sayings (hadiths) with regard to medicine. One of the earliest and most widely referenced works is the "*Healing with the Medicine of the Prophet*" by the 14th century scholar Ibn-Qayyim Al – Jauziyah (Ibn-Qayyim, 2003). Ibn-Qayyim's era was after the collapse of the Abbasid Caliphate. His book summarised most of the authenticated hadiths of the Prophet with regards to medicine and therapy. He included in his work some of the teachings of the medieval physicians and included advice of his own.

However, no major public health aspects of the Prophet's saying are analysed in his book. As for the scholars of hadith, they reported the sayings and concerned themselves with the authentication process. This has led to an almost historical vacuum of public health in this particular era. None of the sayings of the Prophet nor his actions or the policies practised

under his rule have been analysed using the understanding of public health policy and indeed healthy public policy that are present in modern times..

2.4 Public Health and the era of the Righteous Four and the Ummayad period:

A literature search of the era of the Righteous Four with regards to public health showed absolutely no study or analysis known to the student. No medieval or modern medical work analyses any achievements in that era. Modern Western writers appear to have focused only on medical and scientific aspects rather than the holistic understanding of health. Muslim historians themselves seem to be content with analysing the religious piety and moral achievements of that era whilst Muslim historians of medicine seem oblivious of any reforms that may have affected the health of the population.

Volumes of historical work both medieval and modern exist on the life and times of the Righteous Four but none analyse the public health of the populations they governed. Whist social policies have been documented extensively, scholars seem to be have completely separated them from the effect on population health either due to research projects that side line the importance of public health as a social discipline in its own right or due to a calculated attempt in some cases to dismiss any achievements in health during that era.

The well-known historian of Islamic culture and Medicine, Manfred Ullman in his classic history of Islamic Medicine dismisses the era of the Prophet as doing "nothing to change the medical conditions" that existed prior to Islam (Ullmann, 1978, pp 4). On closer examination of Ullman's work, he came to that conclusion simply because of the lack of evidence available to him that such an improvement did occur.

Indeed, Ullmann wrote that whilst the Qur'an discussed so many questions about human living, "neither the doctor nor medicine are anywhere mentioned" (Ullmann, 1978, pp 4). In his famous book "*Islamic Medicine*", a widely referenced source for Western historians, he

gives just about a page to some talk on the Hadiths and eventually dismisses the sayings as unimportant as they make up some of the folk medicine found in all primitive societies. He goes on to write that if the Hadith was to be left out then:

"very little is known about medicine in the early Islamic and Ummayad Periods"

(Ullmann, 1978, pp 5)

He was however able to analyse some "anecdotes" from some medieval manuscripts and gives two examples of medical science. He then gives three names of doctors who presumably practised Hellenistic medicine in Arabia at the time but is quick to say that the reports of these men were unclear and full of contradictions. His book then moves in, to a discussion of the Translation movements and medical practice in the Abbasid Caliphate (Ullmann, 1978, pp 6).

The historian Roy Porter edited "*The Cambridge History of Medicine*" (Porter, 2006) and wrote a book on history of medicine from antiquities to recent times. Porter again mentions little of the public health history or the social welfare state system in the Islamic Caliphate and concentrated on the medical therapy and translations in the Abbasid Caliphate. This is not surprising as his book again falls under the traditional focus on the history of medicine rather than a history of health. Whilst he mentions the origin of the first Hospital in the Ummayad period, Porter seems to downplay the role of the Caliphate in the provision of a secular hospital system.

In their book, "*Medieval Islamic Medicine*" (dedicated to Manfred Ullman), Porman and Savage-Smith mention little of the public health history in the early Islamic period apart from a paragraph where they report that Prince Khalid ibn Yazid of the Ummayad dynasty commissioned the translation of Greek medical works but they cast doubt on the historical foundation of this report (Pormann and Savage-Smith, 2007, pp 24). They however assert that we have little information on the medical literary activity in that era not to mention medical

practice. Again the role of social welfare state or even its existence in the Caliphate or its effect on health are completely absent in this work.

In her book "*Health, civilisation and the State, a history of Public health from ancient to modern times"*, Dorothy Porter mentions little of the public health history in the Islamic Caliphate. From a very small paragraph on the initiation of hospitals in the Abbasid Caliphate, 600 years of Islamic rule was not studied at all (Porter, 1999, pp 23).

As for the *Oxford handbook of Public Health*, it sufficed itself in its time line of the history of public health by a single line "900CE – Hospitals appear in the east" without saying which East (Pencheon et al., 2002, pp 617).

Giladi's research on childhood mortality and perspectives in medieval Islamic times was an attempt to highlight problems faced by children in medieval Islamic period. However most of the examples cited by him relate to much later dates and very few examples are recorded dating back to the early Islamic period (Giladi, 1989, pp 121 - 152).

It is apparent from the Literature search that most modern historians of medicine in medieval times have concentrated more on medical advancements. There seems to be a massive gap in research in the social welfare systems of medieval times and their effect on health.

Muslim historians of medicine have not helped either in attempting to construct the public health history of the Caliphate. Following the style of their western counterparts, they have concentrated yet again on medical therapy and the provision of the hospital system whilst ignoring the bigger picture of public health. In his book Islamic hospitals, Alsaeed describes numerous hospitals in the Islamic medieval period including leprosariums (Alsaeed, 1987, pp 80).

Recently several Muslim authors have re-visited the works of the great physicians of the Abbasid Caliphate like Abu Bakr el Razi (Rhazes) and Ibn Sina (Avicenna) and translated

and interpreted their works in the light of modern day medical practice (Tibi, 2006, pp 206 - 207). The works of the Muslim Andalusian surgeon Abulqasim Al-Zahrawi (Abulcasis) have also received attention by both Muslim and non-Muslim medical historians (Al-Rodhan and Fox, 1986, pp 92 - 95). His impressive array of surgical instruments is still present with us today and his treatises have caused intense debates within modern medical historical circles.

In a paper titled "Arabian Medicine" written for the Royal Society of Medicine in 1984, the authors seem to concur that most medicine practised in the Ummayad period was folk medicine and that practically speaking scientific and intellectual medicine started in the Abbasid era as the Ummayads were more interested in expanding their territory. Apart from the mention of a Muhtasib (or Health Inspector) that regulated public health matters as refuse collections and spread of contagious diseases as well as acting as an Ombudsman in the Abbasid Caliphate, nothing more is mentioned. The authors summarise the findings of those before them looking at medical therapy and science in the Abbasid era (Shanks and Al-Kalai, 1984, pp 60).

2.5 Public health historical works in recent times looking at welfare systems:

In contrast, public health historians looking at Europe seem to have recently tackled public health from several angles and not just medical therapy and hospital provisions. Rosemary Rees' *Poverty and Public Health (1815 – 1948)* looks at the impact of welfare reforms and poverty on public health in Britain in that era (Rees, 2001). In the same vein, Dorothy Porter in her book quoted previously expanded well into these aspects of public health when looking at the European and American states (Porter, 1999).

Thus whilst there is now a growing interest in looking at public health history from all its angles in the Western hemisphere, little if anything has been analysed in the medieval Islamic period.

However, one may ask – is there a need to study medieval welfare systems to understand population health? Do social welfare policies have any effect on population health?

Many modern day scholars of health have argued that social welfare policies may have more effect on population health than the actual practice of medicine. As the WHO definition of health includes social well-being, it is clear that medical practice alone cannot look after this aspect of health. In the last two decades, two theories dominated the understanding of the concept of population health. The salutogenic theory promulgated by Antonovsky (Antonovsky, 1996, pp 11 - 18) focused on what makes a human being healthy including health maintenance. Antonovsky's theory appears to have been influenced by the WHO Ottawa Charter on Health promotion. On the other hand, the biomedical theory (also known as the pathogenic theory) supported by the medical profession at the time (and most likely the pharmaceutical companies) promulgated that health was simply the absence of disease (Naidoo and Wills, 2009, pp 6).

The UK provides an almost perfect example on the impact of social welfare on health. Towards the end of the 19th century, robust social welfare policies including sanitation and housing improved (Rees, 2001, pp 149) population health in the absence of antimicrobials and advanced medications and medical interventions. Indeed deaths due to *Mycobacterium tuberculosis*, the causative organism for tuberculosis had already started to fall before the discovery of antibiotics.

Modern day researchers like Tarlov have emphasised that more than 80% of the improvement in life expectancy in Britain in the last 100 years were due to advancements in the social determinants of health for the population rather than medical advancements (Naidoo and Wills, 2009, pp 8).

Indeed, with significant health inequalities existing within the UK (Acheson, 1998a), despite a free and advanced UK medical delivery system (the National Health Service), the

social determinants of health and the role of social welfare policies in population health are slowly becoming as important (if not more important) than medical advancements.

In the last 2 decades, the WHO as previously mentioned has promoted the concept of "healthy public policy" where all Government departments and societal sectors are integrated with the aim of assessing the effect of any policies on health (WHO, 2014a).

Recent research has shown a direct link between frank medical conditions (for instance heart diseases) and the social determinants of health like income and social security (Wilkinson and Marmot, 2003).

The above modern review summarises the role of social welfare policies on the health of populations. As this has only been studied in modern day states in the last few decades, it is no surprise that the medieval period of Islam has not been studied from the social policy point of view and its effect on health. No such study exists as at the time of this research.

A critical analysis of the reasons of the lack of literature on this aspect of medieval health care can possibly be drawn on the differences in the sources of Islamic Medicine and the potential sources for a research on policy and social determinants of health in the Islamic period. Most of the sources of Islamic Medicine are primary sources i.e. written by the actual authors and protagonists. They are thus very attractive to historians who could analyse these sources directly. For instance the Canon of Medicine written by the medieval physician Ibn-Sina provides insight into the physician's own practice and understanding of medical conditions. Due to the well-known prominence of this physician, further understanding of the advances present in his times could be extrapolated. The medical works of Ibn-Sina and other medieval physicians also provide a quantitative analytical framework of analysis of a physical science such as medicine. Their ideas and understanding can be effectively measured using the laws of medicine that have now been verified by modern science.

Whilst many modern historians of medicine have praised these works, it is much easier to also judge where the medieval understanding of the physical nature of the human body may have been right or wrong.

Furthermore, language has been a major factor in the preservation of these works. Many of the works of the Islamic medieval physicians were translated into Latin and other European languages contributing to the Renaissance. Again this has helped many Western historians to draw comparisons between original manuscripts and translated works to be able to see if any interpolations may have distorted original writings.

Finally, Islamic medical works written in the medieval period were also mostly written by authors who themselves practiced medicine and therefore they were the "experts" of the time in their field. This meant that they recorded what was relevant to the profession and provided all the necessary information needed for fellow experts to analyse.

Researching into policies affecting the social determinants of health and public health would need a completely different set of sources. As these policies relate usually to Governments and rulers, the sources would have to be chronicles and historians' perceptions and recordings of the events. As stated, with the exception of the Qur'an and a few other monographs, most of the writings of the history of the early Islamic period were done almost after two centuries after the death of the Prophet of Islam. This would have posed a major problem to modern Western historians as in addition to analysing the specific works relating to health, they would also have to analyse the authenticity of the historians' works.

Furthermore, unlike the medical authors of the medieval period who wrote on medicine, the historical chronicles were not written by authors who were experts in social welfare and public health – they were experts in history. It is thus no surprise that the entire Literature search did not show any chapter in any medieval work or in any chronicles dedicated to social determinants of health. In addition, it was only in the 19th and 20th centuries in the West

that the social determinants of health started to take prominence with myriads of primary sources and documents from Governments available for analysis. As shown above this has not yet been extrapolated to the Islamic medieval period.

Finally, a research in policy and its effects on health will be very difficult to measure quantitatively as this mostly comes under qualitative research frameworks with the exceptions where actual figures are given. Extrapolative qualitative research work could still be carried out since the social determinants of health are universal in time and place but these would have to be in a comparative manner and unlike the physical sciences (medicine included), a quantitative analysis may not be possible. This however leaves the research open to the limitations of assumptions in the absence of a full picture of all factors affecting the implementation of policies especially where such chronicles may in themselves be deficient in providing the needed information – simply because the authors were expert historians and theologians but not social welfare scientists.

This thesis will be the first of its kind to attempt to address these issues and the following chapter will look at the methodology used in this research.

Chapter 3: Methodology

In this chapter the following topics will be covered:

1. The actual fields and study design of the research
2. The methodology and conceptual framework of the research
3. The sources of the research
4. The analytical methods of the research
5. Strengths and limitations of the data collection

3.1 Research fields:

This thesis concentrates on two major fields. One is historical and the other is public health. Furthermore, it assesses the historical public health policies (and healthy public policies) using modern day understanding of public health determinants and sciences. The complex inter-relationships between history, past public health and modern public health leads the thesis to use a combination of research techniques to allow the most accurate presentation and analysis of the historical evidence.

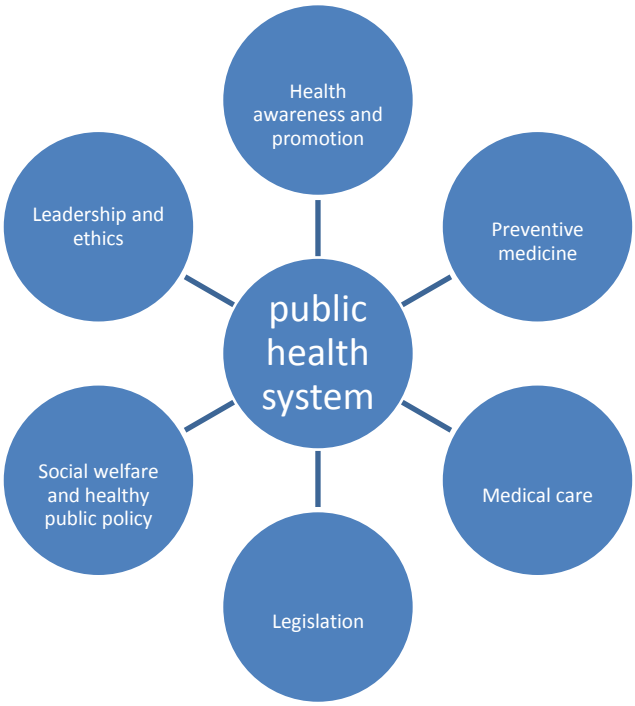
Whilst Western historians and science historians have studied the medical advances that occurred in the Abbasid caliphate, no study exists in the English Language that looks at the entire Caliphate's public health policy, social policies and its position as a welfare state.

3.2 Conceptual Framework for the thesis:

In addressing the research questions at looking at social policies and their effect on public health systems in the Islamic Caliphate, the following conceptual framework was used:

1. The role and attitude of the Caliphate as a welfare state
2. The welfare reforms of the Caliphate
3. The social justice system in applying the principles of welfare
4. The role of the Government in health awareness and promotion
5. Preventive health measures in the Caliphate
6. Medical care and regulation as a function of State.

Figure 4: Conceptual Framework



3.3 The historical research technique and ancient sources used:

This is a qualitative research. The use of historical manuscripts is well known to modern day historians. Usually these manuscripts are classified into primary and secondary sources (Jordanova, 2006, pp 38). The era concerned starts from the time of the Prophet Muhammad till the end of the Abbasid Caliphate. With regards to the Prophet Muhammad, we have only one primary source i.e. a source that was compiled in his time and preserved till this date. That source is the Qur'an written in the Arabic language. Unfortunately, historical aspects relating to the life of the Prophet are not all detailed in this valuable primary source.

The secondary sources used for the era of the Prophet are his hadiths or sayings and the historical works of medieval scholars. These manuscripts were first written well over a century after his death. They have however been preserved and in print till this day. Many of these works including the historical chronicles of the medieval scholars have been analysed in a comparative manner by modern day scholars. It is important to note here that though in theological terms the hadith maybe secondary, the preservations have been accepted by most scholars to be accurate and thus in themselves these transmitted sayings may also serve as primary sources.

3.3.1: The hadith sources:

These valuable books relate the sayings of the Prophet and the Companions using a chain of reporters starting from the author himself and going back to either the Prophet or to his companions. These chains of reporters are called Isnad. The first compilation of these was that of the great scholar of Medina Imam Malik in his famous book al Muwata (Malik) written in the era of the Abbasid Caliph Abu Jaafar Al Mansur (ruled 754 CE – 775 CE).

However, by the second century after the Prophet's death, several sayings and traditions were attributed to the Prophet Muhammad that were clearly false and incompatible with the

well-preserved Qur'an. This led to the scholars of hadith of the time to start the science of authentication. This science was to prove valuable in discerning true from false hadiths.

The technique of authentication looked at several factors in the hadith concerned. For instance every hadith was checked whether it was in accordance with the Qur'an. In addition the chain of reporters was examined and the life of every single reporter studied (Yusoff et al., 2010, pp 613 - 618). Reporters in the chain had to be known to be truthful, have a good memory and well known in their communities. In addition, the place and time the reporter transmitted the hadith had to be studied including the ages of the reporters during reception and transmission of the hadith (Yusoff et al., 2010, pp 613 - 618).

Foremost in this group of scholars is the Imam Al-Bukhari (810CE – 870CE). Over a course of 16 years, he subjected over 300,000 hadiths to his conditions and recorded just a little over 7000 (Khan, 1994, pp 18 - 19). His collection became known as Sahih Al-Bukhari (or the Authentic Collection of Al-Bukhari). Over the centuries, scholars have reviewed his collection and most attested to its accuracy and in modern times his work still remains highly authoritative (Brown, 2004, pp 1 - 37).

After Al-Bukhari, several other scholars followed the same principles of authentication with some variations. Five other scholarly collections are now used universally. With Bukhari's collection, they are collectively called the Six Authentic collections. They are the collections of Imam Muslim (himself a student of Al-Bukhari), Imam Al-Nisa'i, Imam Al-Tirmidhi, Imam Abu-Dawud and Imam Ibn-Majah.

These sources in addition to other collections verified by scholars like Malik's first compendium and the collection of Imam Ahmad Ibn-Hanbal (another medieval scholar of Islam) helped scholars in writing the life of the Prophet Muhammad and some of the companions. They also formed the basis of aspects of Shariah that are derived from the hadith.

These sources are extremely important in this thesis as they provide the foundation for policy development and applications within the Caliphate of Islam and therefore could provide insight into the health of the population at the time. They have thus been used to identify key health issues, measures and policies taken by the Prophet.

Translating these sources from the Arabic language is tricky. However, as the research student himself is bilingual in addition to the fact that most of these sources have now been translated by scholars into the English language, luckily this has not been much of a problem. In addition, the research has made use of a linguist specialising in both Arabic and English language translations.

3.3.2: Historical chronicles:

Few historical manuscripts exist that date back to the time of the Righteous Four. Apart from some monographs, major historical data relating to the Righteous Four and the Ummayad period were written after that era. The first major work was that of Muhammad ibn Jareer Al-Tabari (838CE – 923CE). His massive chronicles known simply today as Al-Tabari's history were written even before Al-Bukhari's hadith. Al-Tabari's work poses major problems to any historical research. Al-Tabari does not hide the fact that several historical episodes in his book may not be accurate. Indeed, it is not uncommon to see two contradictory reports of the same incidence in the same page of his work. Al-Tabari followed the technique used in his time that incidences are reported using a chain of reporters (Martensson, 2005, pp 287 - 331). The scholar simply writes all the information and data available in his time regarding incidences that were prior to his era.

However, at a point in time, Al-Tabari's history becomes a primary source as he wrote the history up to his own era including eye witness accounts. Fortunately, as Al-Tabari recorded the chain of reporters for all incidences, scholars after him, using the techniques of hadith authentication that came after him were able to at least attempt to decipher some of the

false reports in his work. One such scholar was Ibn-Katheer, a 14th century scholar of Islam well known in the Muslim world. Ibn-Katheer wrote the voluminous well known book "*The Beginning and the End*". In this work, he is a secondary source to the Prophet, Righteous Four, Ummayad and Abbasid era. However, Ibn-Katheer in many instances applied the science of authentication and thus his reports though later than Al-Tabari have formed a major source of data for the history of that era. In many instances scholars have taken his reports as more plausible than that of Al-Tabari.

Several medieval scholars such as Imam Dhahabi and Imam Jalaludeen Al-Suyuti wrote extensive history chronicles on that same line. Fortunately, these works are still in print till this day and have served as major sources for the history of that era. These sources have been used extensively in this research and they are referenced throughout the thesis. The use of these sources is for one simple reason: they are the only sources we have that are nearest to that era. Western orientalist scholars have used these works as well (Muir, 1891).

3.4 Modern historical sources:

Modern scholars of Islam have also revised these books. Many scholars have combined the information and data in all the medieval sources to produce a near "consensus" of historical events of that era. The advantage of these modern day revisions is that they can analyse the medieval sources side by side including the chain of reporters and attempt to apply the science of authentication. Again just as Ibn-Katheer's work played an important role as a "back up" to Al-Tabari's work, these modern day works do exactly the same.

These works have been used extensively in this research and they are referenced accordingly. Another major advantage of using the modern works is that as the research student is not a fully trained historian, these works done by renowned modern day expert historians help to as much as possible verify the events recorded in this thesis. In many instances in this thesis when more than one reference is used to qualify a historical data,

usually one of the references is a medieval source and the other is a modern evaluation of the medieval source.

3.5 Data Collection for the Historical aspect:

There is no "chapter" either in the medieval sources or the modern sources of the chronicles called "health services" or "health management" or "public health" in that era. These sources simply record the historical events in chronological order. The Qur'an itself does not classify its health and social welfare rules in a particular section nor do the hadith collections. As such, sources had to be read to identify health related issues and arrange them in chronological order. This technique was the only possible way to gather evidence in this thesis.

Whilst several websites contain electronic versions of all the medieval sources with search engines attached to them, these search engines when used failed to yield the information when the sources were consulted manually. It became obvious during the research that the only way to gather as much information and data was to do so by reading.

3.6 Methods of data collection from the historical sources and analysis:

As most of these sources are voluminous, the following types of reading were employed:

1. Skimming: This involved reading the major headings in each part of the historical source and picking headings likely to be linked to the research
2. Speed reading: the researcher is experienced (from his background in the medical profession) in this type of reading. Using a "hand on line" technique, data was identified from the historical source.
3. Deep reading: When data was identified using the above techniques, deep reading of the section was done. On many occasions, it involved going back several sections from the ones identified to understand the context and the events that surrounded the identified data.

4. Use of references from modern historical sources: Modern historical analyses of past events are usually well referenced. Relevant references were used to gain further understanding of the data thus expanding the source pool.
5. Internet search: broad terminology was used on the internet search engines and relevant information and references identified. However, sources had to be from accepted published papers in peer – reviewed journals or in well renowned expert books or websites on the subject.

3.7 Modern Public Health Sources:

The far reaching breadths of modern day public health meant that modern day social policies, public health research and medical research into public health had to be included in the source pool for accurate comparisons with the historical data in an attempt to derive possible effects on population health at the time. The following sources were used:

3.7.1 PUBMED search:

Each policy/event recorded was searched using the PUBMED website to search for any modern study that may look at the impact of the specific policy. On the PUBMED search, relevant papers that were seen to give the nearest analogy were retrieved. These papers were then used to compare the modern study on the policy and its effect in modern public health and then derive the probable effect it would have had in the era discussed.

3.7.2 WHO website:

This website was used to look for similar polices to those uncovered by the historical research. WHO recommendations, studies and conference reports that were analogous to the historical data were retrieved and used in the analysis.

3.7.3 The use of modern day health care policies and case studies:

In some parts of the historical data, specific incidences were subjected to case studies. The particular episode was studied in detail and modern day medical knowledge used in explaining the recorded historical outcome. This method of analysis has been used previously by other researchers including Alvarez, Poremann and Savage-Smith (Pormann and Savage-Smith, 2007, pp 47).

Specific incidences would include special polices regarding women and children and the care of the elderly. In addition, epidemics that were recorded in the historical sources were subjected to the principles of case based scenarios in similar modern situations to assess the possible efficacy of the Caliphate's response.

3.7.4 The use of modern Public Health Textbooks:

These were also consulted throughout this research to further gain understanding of the field and policies concerned. These textbooks included books that concentrated on social policy and health care management that are integral aspects of modern day public health. Textbooks on modern day public health history were also included in the source pool.

3.7.5 Broad search techniques on the University online Library and Internet search engines:

The University of Gloucestershire online library was used to find relevant modern day published works. In addition well-known internet search engines were employed including Google Scholar.

3.8 Public health data collected:

In attempting to study the public health policies and practices in that era with a modern perspective, it was necessary to search for data that directly affected public health from the aspects we know today. As previously mentioned social welfare is directly related to public

health. Whilst previous studies on medieval health systems were concerned only with either sanitation, infectious diseases and/or some forms of direct medical interventions, this research included these in addition to all policies regarding social welfare, economic growth, water supply, food production, education, social justice, stable ecosystem, effect of war/uprisings and occupational health. All these are part of the public health umbrella.

In addition, the historical context of the data was retrieved to add to the understanding of the policies and public health impact. Where the political situation influenced the reform, this was also retrieved and analysed.

3.9 Coding:

The data was coded according to the following classifications:

3.9.1 Era classification

Historical data classification was done in a chronological order as most historians use this technique. In addition, each era demonstrated different styles and this study would complement other relevant historical research of the same era that used chronological classifcation. The chronological order itself was further divided into 4 distinct eras. These are:

1. The era of the Prophet Muhammad
2. The era of the Righteous Four
3. The Ummayad Era
4. The Abbasid era

This classification was used as it is the most widely used classification by modern day historians (both Muslim and Western) to describe this period of Islamic History. Western historians that have used this classification include Muir, Manfred Ullman and Emily Savage – Smith to mention but a few. This study has not deviated from this tradition.

3.9.2 Data coding

Under each era, the data was classified using the following codes:

1. Political context
2. Social/welfare reforms
3. Economic reforms
4. Health maintenance and preventive medicine
5. Legislative reforms
6. Rehabilitation
7. Medical activities
    a. Translational work
    b. Hospital system
    c. Care of the sick
8. Historical context and circumstantial evidence surrounding the events: this added weight to the authenticity of the actual health related event. For instance, if a health event led a shift in government policy or vice versa and the chronicles record the names of officials and the timing in addition to any consequences thereof, these were included in the thesis.

3.9.3 The use of dates:

The Islamic calendar dates from the time of the Prophet's migration to Medina (see Introduction). The migration known as the Hijra was set as the beginning of the Islamic Calendar year system by the second caliph Omar ibn Al-Khattab. Thus the letters AH denote After Hijra. In the thesis, the CE (Common Era) is used mostly as this thesis is done in the Western world. Where necessary, the AH equivalent is placed side by side the CE date.

3.10 Data analysis and interpretation:

A thematic content analysis of the historical data was performed. The following techniques and principles of data analysis and interpretation were used. These techniques included historical techniques and qualitative health care research techniques.

3.10.1 "Understanding" the data:

As in any other qualitative research, "understanding" involves the researcher's perspective and interpretation of the data (Hennink *et al*., 2010, pp 17 - 19). In this case, the researcher applied modern day public health theories, models and policy effects to understand the potential importance and interpretation of the data. This included peer-reviewed published works and WHO documents.

3.10.2 The Verstehen concept:

This concept used in qualitative research looks at the study population's own perspective in interpreting the events that happened to them (Hennink *et al.*, 2010, pp 17 - 19). In historical research of this nature, this is quite difficult as manuscripts may not have direct recordings of peoples' perception. However, where data was available in this regard, it was recorded. The researcher used such data to compare the people's interpretation of the event versus the modern day understanding of the event.

This concept is also used in qualitative analysis in understanding the meanings of events or phenomena that occur in societies (Ponterotto, 2005, pp 126). This could also apply to researchers and not just to the actual participants in the research. In this research, the concept has been used to integrate the meanings of the religious texts in the context of the society and culture of the era as recorded by historians and religious scholars. This is particularly important as many Western scholars of the era have failed to understand the meaning of certain actions by disregarding the religious and cultural contexts of the society (Said, 1980, pp 488).

Furthermore, the understanding of the social policies as applied to health and medical care has been again integrated in this thesis to the understanding of the cultural contexts. The advantage here is that the I am both a Muslim and an Arab who understands the culture and at the same time a fully trained health care professional. As this thesis would show, the lack of the above combination may have made many of the scholarly works in the Western world miss important facts in that historical era.

3.10.3 Positionality:

I am a Medical professional myself and an NHS Consultant. This position gives me a unique understanding of health care issues and I am able to grasp potential health care policies within historical data.

I am a Muslim and an Arab. Bias is a potential in any historical research and is well known in modern history. However, relying on modern historians to aid in the interpretation of historical facts gives this thesis strength in that it combines the expertise of modern historians and my medical expertise. In addition constant reflexivity was used throughout the research process (McGhee et al., 2007, 334 - 342).

3.11 Strength of the thesis:

1. Uses well known primary, secondary and tertiary sources to examine for the first time the interaction of social welfare and public health in a hitherto unstudied era of history.
2. Provides the Western English speaking world with a narrative analysis of the policies in that era in the English language in a chronological sequence
3. Attempts to analyse the policies in light of modern day public health practice
4. Records both positive and negative policies to provide as much as possible a balanced historical narrative of public health in that era

5. Provides a bridge in the gap of contemporary western historians who concentrated mainly on the medical advances in the Abbasid Caliphate.
6. Historiographically grounded in the authority of modern day historians in analysing the historical medieval sources.

Indeed according to the modern day historian Hugh Kennedy:

"We are extremely fortunate in the vast range of literary evidence available, from brief annals which may do little more than contribute a missing name or date to great compilations like Al-Tabarls ta'rikh al-rusul wa'l-muluk (History of the Prophets and Kings) or Al-Baladhuri's Ansab al-asraf (Geneologies of the Nobles) which contain a vast amount of anecdotal and circumstantial detail to fill in the bare facts and give life and substance to the names" (Kennedy, 2004, pp 346).

3.12 Limitations of the research:

1. With the exception of the well preserved Qur'an, the rest of the sources cannot be verified in an absolute manner.
2. Medieval historians may have erred in their narratives.
3. Subjectivity of the historians may have influenced their writings.
4. Subjectivity of the researcher himself. The researcher is a Muslim and an Arab. However this weakness was curtailed throughout the project using constant reflexivity.
5. The comparative analysis involving modern day public health insights was totally at the judgement of the researcher and lacks a consensual approach. This is due to the fact that this is the first ever research in this era of history of public health.

Furthermore, as has already been stated, the major issue of authentication is problematic with many medieval sources having been written prior to the authentication process and long

after the actual events. Even after the authentication process, some of the chroniclers may not have adhered to the strict rules when documenting Governmental policies as they would if they were recording the Prophet's statements. Again one has to be careful with such data as Hugh Kennedy warns:

"The literary material is so good, lively, interesting and often written by men of great intelligence and discernment, that it can blind us to the fact that it tends to limit the sort of historical approaches which can be used and there are whole areas of Islamic history which forever will remain obscure" (Kennedy, 2004, pp 346).

The methodology of some of the chroniclers who simply documented all the anecdotal evidence and sayings in their time without authentication has been discussed with resultant contradictions in some of the reports (Kennedy, 2004, pp 353). Bias of the historians themselves has already been mentioned even though Robert Hoyland in his book *"Seeing Islam as others saw it"* (cited in Kennedy, 2004, pp 350) stated that contemporary non-Muslim sources for the early period of Islam were similar to their Muslim counterparts suggesting there was a good deal of accuracy in the Muslim narratives. However, as Kennedy has stated, we may never know for certain some of the events that happened during the medieval period.

In addition, some of the events surrounding the policies retrieved that would have been necessary to shed more light on the impact of these polices were missing. This again was a limitation in this study but as previously stated could be explained by the fact that the chroniclers were not public health experts. Indeed in many cases, the lack of substantial data could be seen as a sign of decline in the State systems when compared with the richness of data available for other eras within the same chronicles.

Finally, I have made use of modern historians for historical analysis of the medieval manuscripts and chronicles. Whilst this has an added advantage that the thesis makes use of expert historical analysis on the one hand and expert health care knowledge (myself) on the other, such a use of "tertiary sources" could also be a limitation as it is dependent on a third party analysis which in itself is subject to bias and possible distortion. However, the presence of two supervisors in this thesis (one a historian and the other a health care expert) has been very helpful to limit this problem. In addition, I have noted several weaknesses in works done on the history of medicine in general written by historians who are not medical professionals or health care experts. These weaknesses relate to the interpretation of medical and health care issues and not the historical aspects. Conversely just as a historian is bound to make mistakes in interpreting historical medical and health care issues if he does not rely heavily on medical experts, so would a medical expert make similar mistakes in interpreting historical events if he does not rely on a historian. Thus despite the problems of relying on renowned historians, it was felt that by both myself and the supervisors that it was safer and would give far more validation to this thesis – considering that it is the first ever of its kind – to bring forth the historical data and examine it myself using historical methods but also have it validated through the works of modern day historians prior to subjecting it to health care analysis. This position was enforced by the fact that this is not research in history only but primarily a research in comparative public health policy. The following chapters will look at the results of this research.

Results/Discussion

Chapter 4: The Era of the Prophet and the Righteous Four

Section 1: The Era of the Prophet

In this section, the following will be discussed:

1. The foundation of the Islamic Welfare State
2. The Prophet's traditions regarding health and outlines the provisions for public health at his time
3. The Prophet's traditions regarding preventive medicine and medical care
4. Provides an outline of health indicators considered during that era that laid foundations for subsequent eras
5. Medical legislation

4.1.1 The Prophet and the Welfare State:

The Prophet set up the principles of a welfare state in Medina (Hasan-uz-Zaman, 1991, pp 81). Taxes on personal wealth, livestock and land were used to cater for the welfare of the citizens. The Prophet's example was implemented in detail by the Caliphs that came after him and to avoid repetition in this thesis, the actual implementation of the principles of the welfare state will be discussed under the section of the Righteous Four. The laws of the Qur'an and the Sunnah (practice of the Prophet) laid principles of social policy and public health that were to be enforced. These would later influence the political strategy governing public health policy by later Caliphs.

This thesis has classified briefly the principles laid down by the Prophet with regards to Public Health in the following sections.

4.1.2 Importance of Health:

The Prophet is quoted as saying:

"Two bounties regarding which many people cheat themselves: health and free time" (Al-Bukhari in Ibn-Qayyim, 2003, pp 194).

"He who reaches the morning while health is still in his body, safe in his residence and having his day's sustenance will be as if the entire life of this world was granted to him." (Al-Tirmidhi in Ibn-Qayyim, 2003, pp 195).

"Ask God for certainty of faith and good health, for indeed no one will have a better possession after certainty of faith than good health" (Ibn Hanbal in Ibn-Qayyim, 2003, pp 195).

These words of the Prophet raised the awareness of the importance of maintaining good health amongst the early Muslim community. By placing the health as second only to the Faith itself, the Prophet had raised the priority of health care for individuals as well as the society. Indeed in the above statements made by the Prophet, health is not only a societal issue but a personal responsibility as well.

4.1.3 Preventive Medicine:

Numerous sayings of the Prophet have been preserved in Islamic Historical works with regards to preventive medicine. This formed the backbone of maintaining the health of individuals. These include:

4.1.3i Personal hygiene:

a. Oral and dental care

The Prophet encouraged individuals to clean their mouth and rinse it regularly. Rinsing of the mouth with clean water is part of the ablution a Muslim makes before prayers. The Prophet emphasized the importance of cleaning the teeth with a brush. In his time, a type of wooden brush called the Siwak was used to brush the teeth. The Prophet asked his followers to make sure that they remove all food trapped in between their teeth. He also said:

"Had it been that I feared for making things difficult for my community, I would have commanded them to use the Siwak before every prayer" (Al-Bukhari & Muslim in Ibn-Qayyim, 2003, pp 280).

The Siwak is a chewing stick made from the plant *Salvadora persica*. One recent study from Sweden compared the use of the Siwak with tooth brushing. The research concluded that the use of the Siwak resulted in significant reductions in plaque and gingival indices. A bacterium called *A. actinomycetemcomitans* was significantly reduced by Siwak use but not by tooth brushing (al-Otaibi, 2004, pp 75). Thus the Prophet's recommendations would have helped in preventing dental caries and to a certain extent maintain oral hygiene. The Prophet's emphasis on oral hygiene and its importance was quite profound to the extent that 1400 years later, a lot of Muslims still abide by his instructions and Siwak is still sold (sometimes commercially wrapped) in a lot of countries (al-Otaibi, 2004, pp 75).

In the last decade, the WHO has placed increasing emphasis on dental hygiene as a strategy in preventing dental diseases in developed and underdeveloped nations. The policy of the WHO Global Oral Health Programme emphasises that oral health is integral and essential to general health, and that oral health is a determinant factor for quality of life. The policy is detailed in the World Oral Health Report 2003 (Petersen, 2003, pp 3 - 24). Oral disease is the 4th most expensive disease to treat. In another WHO report, the author states that the promotion of oral health is a "cost-effective strategy to reduce the burden of oral disease and maintain oral health and quality of life" (Petersen, 2008, pp 115 - 121).

The WHO Oral Health Programme has worked hard over the years to put oral health high on the health agenda of policy and decision makers worldwide. With the birth of the Islamic Welfare State in Medina 1400 years, its Head of State as seen had placed oral and dental health high on his agenda. His injunctions which were followed by his companions and taught by them to the conquered territories would have greatly reduced dental and oral diseases in addition to increasing quality of life from that point of view. This led to a modern theory that the Prophet may have been one of the first in available literature to set up a preventive dental health programme (Redzepagić, 1996, pp 35 - 39).

So important was oral hygiene taken in the Islamic State that many scholars record a well-known narrative that has circulated in the last 14 centuries in the Muslim world. In his last days, the Prophet had fallen quite ill. He was so weak that he could not lead the prayers in the Mosque of Medina. As he lay on his bed, one of his companions Abdelrahman ibn Abu Bakr, who was also the brother of the Prophet's wife Aisha, entered the room holding a Siwak in his hand. Aisha noticed the Prophet looking at the Siwak and knowing his keenness on oral hygiene asked him whether he wanted to brush his teeth. The Prophet nodded. She asked her brother to give her the Siwak and she brushed the Prophet's teeth with it. Many scholars have documented that this was the day the Prophet died (Al-Mubarakpuri, 2002, pp 557). This narrative has been related for centuries. The Prophet had maintained the importance of oral hygiene even in the extreme period of his illness and on his last day alive. This narrative enforced the importance of oral hygiene amongst the early companions and was taught through the centuries.

b. Ablution and Washing of hands:

Islam requires Muslims to maintain a high level of cleanliness. The Prophet said:

"Purification is one half of Faith" (Muslim in Al-Sheikh, 1996, pp 15).

Muslims are commanded to pray five times a day every day. The Qur'an commanded that ablution must be performed prior to performing prayers. Ablution consisted of using clean water to wash the hands, the face, the forearms, wipe the head and wash the feet up to the ankle (Qur'an; 5:6). The hand washing included the wrist, palms and fingers. Furthermore the Prophet used to wash his hands before eating (Al-Nisa'i in Al-Sheikh, 1996, pp 18). The Prophet emphasised that when washing one's hands and feet, individuals should make sure that the water runs between the fingers and the toes (Al-Tirmidhi in in Al-Sheikh, 1996, pp 18). As part of the maintenance of personal hygiene the Prophet said:

"Five things are dictated by sound human nature: Circumcision, Nail clipping, shaving the hair of the armpit, shaving the hair of the pubic region and trimming the moustache" (Al-Nisa'I in in Al-Sheikh, 1996, pp 18).

c. Bathing:

The Prophet also emphasised the importance of bathing. Considering that the Peninsula was mostly an arid desert with little water, he still insisted on Muslims taking regular baths. For instance he said:

"To take a bath on Friday is the duty of every post-pubertal Muslim and he should also wear whichever perfume he can" (Al-Bukhari in Khan, 1994, pp 263).

The Prophet picked Friday as this is the day of the Islamic congregational prayers and he disliked people coming to the mosque with bad odours.

d. Ban on contact of urine with clothes:

The Prophet warned people that it was a sin to leave their clothes soiled with urine. The urine had to be washed off the clothes. Indeed on one occasion, the Prophet had warned that a man was punished in the grave for leaving urine on his clothes on a regular basis. The narrative is provided by the Prophet's companion Ibn Abbas:

"Once the Prophet went through the grave-yards of Medina and heard the voices of two men being tortured in their graves. The Prophet said, "They are being punished not for a major sin, but their sins are great. One of them used not to save himself from being soiled with urine, and the other used to go about with calumnies" (Al-Bukhari in Khan, 1994, pp 128).

Washing any residual urine off the urethral meatus was encouraged to make sure that clothes were free of any urinary stains.

4.1.3ii General sanitation and environmental protection:

In addition to personal hygiene, the Prophet instructed general cleanliness of the environment and laid regulations on environmental protection. He banned people from passing urine in stagnant water pools or lakes (Al-Bukhari in Khan, 1994, pp132). He also stopped passing of human excrement in public places (Muslim in Al-Sheikh, 1996, pp 18). He himself took part in cleaning up the surroundings of his house and Medina was known for the cleanliness of the city. Indeed on one occasion reported by medieval sources, a Bedouin had entered the premises of the Mosque of Medina and urinated in the open space near the wall. The companions of the Prophet knowing the laws of sanitation started to shout angrily at the man for disobeying the law. The Prophet however, knowing the Bedouin's ignorance of the rules, stopped his companions (Al-Bukhari in Khan, 1994, pp 129) and took the Bedouin aside and quietly educated the man on the laws of sanitation and forbade him from repeating the action.

He encouraged the planting of trees and classified it as a "lasting charity" i.e. a charity whose reward continues even after the death of the person. The Prophet stated:

"If a Muslim plants a tree or sows the seeds of one, then a bird, or a human or an animal eats from it, it is regarded as a charitable act for him." (Al-Bukhari in Khan, 1994, pp 505).

In war, he commanded that no trees be burned. Furthermore, the Prophet had commanded that animals should not be killed without just causes. He stated:

"whoever kills a small bird frivolously, then it will cry out to God on the judgment day 'O God—a person killed me senselessly and needlessly, and without any reason or benefit to him!" (Al-Nisa'I in Stilt, 2008, pp 45).

Such environmental and ecological rules and regulations served as the basis of Islamic Law with regards to environmental protection.

Gillian Rice examined Islamic environmental ethics based on the commandments of the Qur'an and the Hadiths of the Prophet. Her work is by no means exhaustive but summarises the main aspects of environmental protection as understood in modern times and shows that the Islamic State appeared to have laid down the principles and regulations 14 centuries previously. Table 3 provides a summary of the environmental ethics and the derivative sources in Islam as shown in her publication (Rice, 2006, pp 380).

Table 3: Islamic Environmental ethics modified from Rice G "Pro-environmental Behaviour in Egypt: Is there a Role for Islamic Environmental Ethics?", *Journal of Business Ethics* (2006) 65: 380.

Ethical principle	Evidence
Stewardship	''And we have given you [humans] mastery over the earth and appointed for you therein a livelihood....'' (Qur'an 7:10)
Preservation and protection of creation in all its forms	''Work not corruption in the earth after it has been set in order, and call on Him in fear and hope. Surely the mercy of God is near to those who act with excellence.'' (Qur'an 7:56) ''The seven heavens and the earth, and all beings therein, declare His Glory. There is not a thing but celebrates His praise, and yet you understand not how they declare His Glory.'' (Qur'an 17:44.)
Respect for the privileges of other species	''There is not an animal in the earth, nor a flying creature, flying on two wings, but they are communities like you.'' (Qur'an 6:38) ''...there is no Muslim who plants a tree or sows a field from which a human, bird, or animal eats, but it shall be reckoned as charity.'' (Muslim, 1552)
Using no more than what is necessary	''...and do not waste in excess, for God loves not those who waste.'' (Qur'an 6:141)

4.1.3iii Contemporary analysis of the effects of personal hygiene and sanitation:

Sanitation was at the core of the State policy right from the Prophet himself. With rules and regulations set on personal hygiene, community sanitation and water protection, the early Muslim community understood the importance of sanitation on a personal and environmental level as part of their religious beliefs. In modern times, public health really stemmed from sanitation reforms in the 19th century. These reforms brought major health improvements (Wilson and Mabhala, 2009, pp 22; Susser and Susser, 1996, pp 668 - 673). In a report Edwin Chadwick in 1842 (Secretary of the Poor Law Commission) described the appalling sanitary condition of Britain's poor. Quoting the medical officer for Whitechapel in London, he wrote:

"The poor merely passed dirty linen through very dirty water. The smell of the linen was very offensive and must have had an injurious affect upon the health of the occupants. The filth of their dwellings is excessive and so is their personal filth" (Rees, 2001, pp 162)

It is likely that the "dirty water" referred here was urine as the poor frequently stored their urine until it became very strong and then used it to "wash their clothes believing it was a cleansing agent" (Rees, 2001, pp 162). Such practices of course are in stark contrast to that practiced by the early Muslims 13 centuries earlier.

Another WHO report in 2005 showed that increased access to sanitation and personal hygienic practice resulted in positive impacts on health. The same report attributed 3.1% of deaths (1.7 million) world- wide to unsafe water, sanitation and hygiene with most of these deaths occurring in developing countries and 90% of deaths are children (WHO, 2005). A study analysed 144 studies to examine the effect of improved water supply and sanitation facilities on worm related infections. The authors recommended providing water as close to

the home as possible to encourage use of large amounts of water for hygienic practices and hygiene education being integrated into water supply and health programmes (Esrey et al., 1991, pp 609). This thesis will show later that Caliphs constructed several water channels and rivers to bring water as close to the city dwellers as possible. In addition several wells were constructed and existing ones purified. The Caliphs simply implemented the policy set out by the Prophet himself. Their actions mirror the recommendations by the above researches and the WHO. In addition, hand washing techniques have become more prominent in the media today especially with regards to the transmission of hospital acquired infections and *Methicillin Resistant Staphylococcus aureus* (MRSA). The table below compares the hand washing techniques prescribed by the Qur'an and the Prophet and that of the National Health Service hospitals in the UK.

Table 4: Comparison of Islamic and NHS hand washing techniques

Islamic Hand washing policy in the Caliphate	**NHS recommendations (NHS, 2007)**
Washing the full hand including the palm	Palm to palm
Washing the full hand including the dorsum	Palm to dorsum
Making sure water runs between all the fingers	Palm to palm with fingers interlocked
As above	Backs of fingers to opposing palms
As above	Fingers to thumb
Washing the fingers	Tips of fingers
The wrist must be included in the ablution	Washing of wrist

By washing hands before eating and clipping the finger nails, as was the practice of the Prophet, modern research proposes that such methods are sure to reduce the risks of transmission of harmful micro-organisms. It is important to remember that the historical data documented that the Prophet placed hygiene as half of faith. Thus great importance was placed to both hygiene and health by the Prophet.

4.1.3iv Sexually transmitted infections:

Islam placed a high emphasis on morality. Extramarital and premarital sex were banned by the Qur'an (Qur'an: 23: 5 – 6). Indeed if found guilty by appropriate evidence, culprits faced physical punishments. In addition the Prophet said:

"Never does sexual perversion become widespread and publicly known in certain people without them being overtaken by plague and disease that never happened to their ancestors who came before them" (Ibn-Majah, Vol 5, Number 4019).

Morality is at the core of Islam as a religion. Recently, a study was conducted into the possibility of using Islamic texts as a starting point for health promotion addressing HIV infection and HIV/AIDS-related stigma in Lamu, a Muslim community in Kenya. The study concluded that in spite of the association of HIV with improper sexual behaviour:

"Islamic texts offer a starting point for tackling HIV transmission and HIV/AIDS-related stigma" (Maulana et al., 2009, pp 559).

In addition the authors felt that under particular conditions, the identified Islamic texts may even justify the promotion of safer-sex methods, including condom use (Maulana et al., 2009, pp 559 – 569). Islamic scholars have validated the permission of Muslims to use condoms in sexual activity provided that it is within the matrimonial state. In another study from Pennsylvania in the USA, the researcher looked at the influence of Islam in preventing AIDS among Senegalese university students. The Senegalese health authorities had involved Muslim religious leaders for over 10 years in their HIV prevention strategy. The country

proudly had the lowest prevalence rate for the disease in the West African sub-Saharan region. The study examined how Islam influences AIDS prevention by testing whether Senegalese participants' degree of religious observance could influence their tendency towards extra/premarital sex, drug use or condom use. More religious students were more likely to abstain from extra/premarital sex (Gilbert, 2008, pp 399 - 407).

Furthermore, modern research has also shown that the practices advocated by the Islamic Caliphate do indeed have positive impact on sexually transmitted infections and their complications including cervical cancer. A study from the University of Washington in the USA looked at the influence of male circumcision and religion on infectious diseases by analysing data from 118 developing countries. The study found that male circumcision was significantly associated with lower cervical cancer incidence and lower HIV prevalence in sub-Saharan Africa (Drain et al., 2006, pp 172). Present estimates by the World Health Organization and the joint United Nations programme on HIV/AIDS show that HIV prevalence is low in the Middle East and North Africa region (0.2%) (UN & WHO, 2006).

Again another study from South Africa looking at HIV prevalence in three predominantly Muslim residential areas in the Cape Town metropolis showed that HIV prevalence among Muslims living in the 3 residential areas of Cape Town was significantly lower than the national prevalence for the whole of South Africa (Kagee et al., 2005, pp 512 - 516). In another study from Harvard University, the author found that among 38 sub-Saharan African countries, the percentage of Muslims within countries negatively predicted HIV prevalence (Gray, 2004, pp 1751 - 1756). Indeed in 1997, a study conducted in Egypt where condom use was minimal at that time, data supported previous UN figures that suggested that the North African nation and indeed the entire Middle East were certainly not experiencing the AIDS epidemic and the study concluded that:

"because cofactors for the spread of AIDS exist in Egypt and condom use is minimal, a likely reason why the epidemic has not had its usual impact is because the population adheres to the Islamic moral code which forbids adultery, premarital sex, and homosexuality" (Lenton, 1997, pp 1005).

It should be noted that all these studies were done in the absence of a political Islamic Caliphate in the present times. Yet with populations applying Islamic principles and values on individual and community basis they were able to achieve the results discussed above. It is thus reasonable to extrapolate from these results that in the era of the Prophet and the Righteous Four, sexually transmitted infections and their attendant complications including cervical cancer would have had a low prevalence. The Islamic community of the Prophet and the Righteous Four exhibited high moral values amongst the population. Both men and women conformed to a dress code that prevented undue attraction to the opposite sex. The Qur'an extoled the virtues of morality and commanded men and women to lower their gaze towards each other to spread a culture of virtue:

"Say to the believing men that they should lower their gaze and guard their modesty: that will make for greater purity for them and God is well acquainted with all that they do. And say to the believing women that they should lower their gaze and guard their modesty: that they should not display their beauty and ornaments except what must ordinarily appear thereof…." (Qur'an: 24:30).

The religion placed so much emphasis on chastity that physical punishments were meted to those who accused women falsely of illicit sexual activity. The Qur'an states:

"And those who launch a charge against chaste women and produce not four witnesses (to support their allegations) – flog them eighty stripes and reject their evidence ever after; for such men are wicked transgressors" (Qur'an: 24:4).

On a spiritual level, the Quran further states:

"Those who slander chaste women, indiscreet but believing, are cursed in this life and in the Hereafter: for them is a grievous Penalty. On the Day (Judgement Day), when their tongues, their hands and their feet will bear witness against them as to their actions - on that Day, God will pay them back (all) their just dues and they will realise that God is the (very) Truth that makes all things manifest" (Qur'an: 24:23).

Integrating the above religious texts with the findings of the modern research stated previously, one can understand the reason for the low prevalence of sexually transmitted diseases in Muslim lands today even in the absence of an official Islamic State in many countries. It would also explain the impact of such religious texts on the spread of HIV/AIDS in many Muslim dominated communities in African nations.

Even in the absence of the physical punishments stipulated by Islam in many of these Muslim states including Egypt, it is clear that Muslims abide by the instructions of the Qur'an. Perhaps the deep belief in the Hereafter and the Day of Judgement is as much a deterrent to sexual immorality as the physical punishments in this life.

4.1.3v Diet and Physical exercise in Islam and contemporary analysis

Hadith sources reported that the Prophet said:

"The son of Adam never fills a vessel worse than his stomach. The son of Adam only needs a few bites to sustain himself, but if he insists, one third should be reserved for food, another for his drink and the last third for his breathing" (Ibn-Hanbal in Ibn-Qayyim, 2003, pp 30).

Here the Prophet warned about overeating. Overeating leads to obesity and the Prophet warned against that.

The Prophet put physical exercise as part of Islam as a religion. He even prescribed certain exercises himself including fast walking, archery, archery, horse riding, and swimming (Athar, 1993, pp 126).

The Prophet encouraged wrestling and racing and indeed on at least two occasions raced with his own wife Aisha (Athar, 1993, pp 126).

The Qur'an itself commanded against extravagance in food and drink:

> "O Children of Adam, wear your beautiful apparel at every time and place of prayer: eat and drink but waste not by excess, for God loveth not the wasters" (Qur'an: 7:31).

The historical data above shows the Prophet's injunctions with regards to avoiding obesity and encouraging physical exercise and includes the Qur'anic commands against extravagance in eating and drinking. Obesity and physical exercise are 2 major determinants of public health. The Prophet spoke of them as part of the religion of Islam and the companions understood them as part of the religious practice. This practice involved women as well as seen in the races between the Prophet and his wife. The Prophet advised against overeating and filling only a third of the stomach with food and another third with fluid. In a landmark research from Harvard University, 811 overweight patients were randomised to several forms of different diets but with overall fewer calories. The study concluded that no matter the content of the diet, provided the calories were less, weight loss was achieved. It also emphasized that group attendances also correlated with sustained weight loss (Sacks et al., 2009, pp 859 - 873). The patients were also asked to exercise about 90 minutes each week. In explaining these findings to *Time Magazine*, Professor Sacks said:

> "We have a really simple and practical message for people: it's not so much the type of diet you eat it's how much you put in your mouth." (Sharples, 2009).

In addition, physical exercise is well known to improve health. Indeed, evidence based practice in physical activity promotion within primary care has emerged (Crone et al., 2004, pp 96 - 103). The economic burden of obesity and physical inactivity on western economies is huge. In a study from Oxford in the UK, overweight, obesity and diet related ill

health cost the NHS about £10.9 billion sterling in 2006-7. During the same period physical inactivity cost the health service £0.9 billion sterling (Scarborough et al., 2011, pp 527 – 535). This represents about 11.6% of the total NHS budget for that period. Another worrying report published in the *Lancet* projected the health costs of obesity by 2030 in the USA and the UK. As obesity is a risk factor for cardiovascular disease, diabetes and cancer, researchers projected an increase in the economic burden in the USA by $UD48-66 billion/year and £1.9-2billion sterling/year in the UK (Scarborough et al., 2011, pp 527 – 535).

Thus the early Muslims living in the era of the Prophet and the Righteous Four following the dictates of the religion would have naturally avoided several ailments related to obesity and physical inactivity. As the sick and infirm usually received benefits from the State in the era of the Righteous Four (as will be shown later), the economic burden of these ailments would have been reduced during that era.

4.1.3vi Ban on alcohol and intoxicants:

The pre-Islamic Arabs drank alcohol in large quantities. In stages the Qur'an placed restrictions on alcohol consumption and finally forbade it completely:

"O you who have believed, indeed, intoxicants, gambling, sacrificing on stone altars to other than God, and divining arrows are but defilement from the work of Satan, so avoid it that you may be successful" (Qur'an: 5:90).

It has been reported that when this verse was recited by the Prophet, the people of Medina in direct obedience to the injunction emptied their wine caskets onto the streets (Blocker et al, 2003, pp 325). The Prophet also forbade all forms of intoxicants as they were classified with alcohol (Al-Bukhari in Khan, 1994, pp 929). Similarly physical punishments were enforced by the State for people caught drinking.

It is interesting that the above verse was the final verse in a complete ban on alcohol. The initial verse in the Qur'an regarding alcohol did not constitute a complete ban:

"O ye who believe, approach not prayers with a mind befogged (drunken)" (Qur'an: 4:43).

It appears that the above verse which preceded the complete ban had the intention of reducing the amount of alcohol the early Muslims were drinking. As mentioned previously, many of these Muslims would have drunk large amounts of alcohol per day prior to entering Islam. It would have been very difficult for them to stop drinking in an abrupt manner. Hence this verse allowed them to drink alcohol but not to approach prayers in a drunken state. As prayers were enjoined five times a day at different times of the day, the early Muslims had to reduce the amount of alcohol they drank to maintain sobriety at prayer times. As they got used gradually to the reduction in alcohol intake, the verse on the final and complete prohibition of alcohol was revealed and its implementation was successful according to the historical data mentioned above.

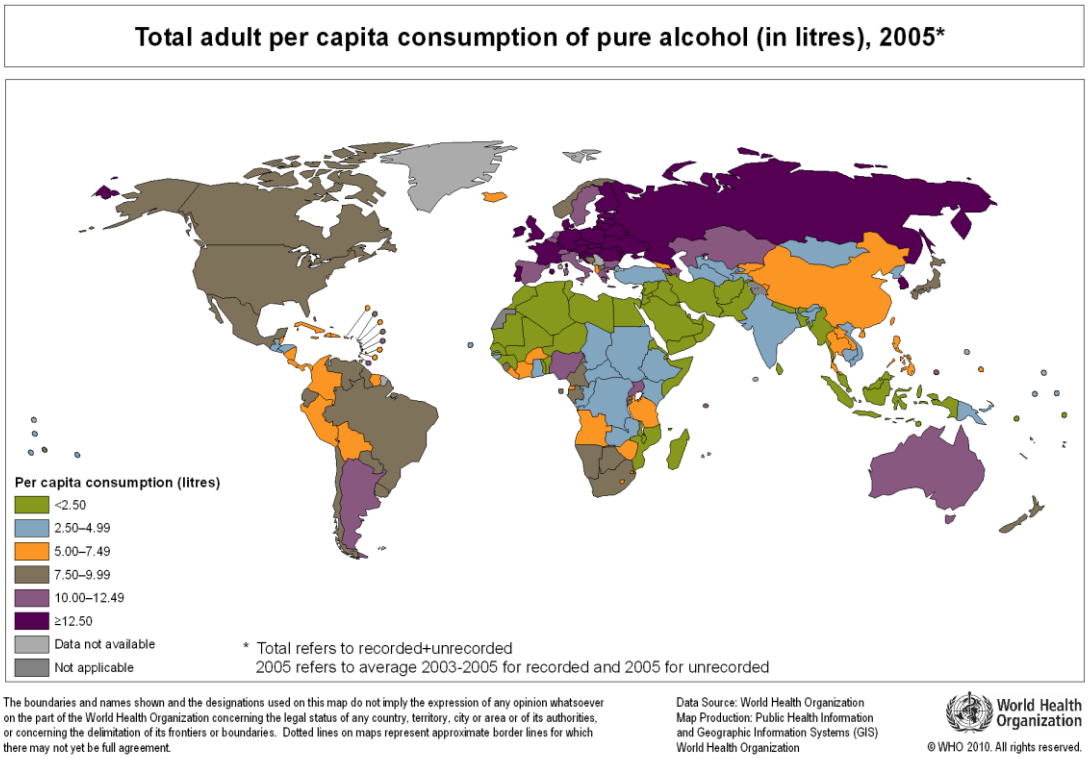
The above technique of gradual withdrawal of alcohol rather than an abrupt ban on intake is supported in modern times by medical research. Indeed, the Qur'anic process of gradual reduction may have very well prevented the well-known and dangerous complication of alcohol withdrawal called simply "alcohol withdrawal syndrome". This syndrome manifests with seizures, hallucinations and delirium and in its severe forms could cause death if unrecognised. Long term management of this condition involves a gradual reduction in alcohol intake (Sellers, 1988, pp 113).

Modern research has shown alcohol to be a risk factor for many diseases including cardiovascular diseases and liver diseases. In addition alcohol either on its own or in conjunction with other factors is estimated to be responsible for at least 33,000 deaths a year in the UK (Sheron, 2004). An estimated 17 million working days are lost each year due to

people missing work due to the effects of alcohol (Strategy-Unit, 2003). Around 6% of road casualties and 17% of all deaths on the road occur when someone has been drinking over the legal limit (Allen et al., 2008). In young adults, binge drinking is also associated with a range of risky behaviours, including a higher risk of contracting a sexually transmitted illness (Harrison and Kassler, 2000, pp 3063-4).

The situation is quite different in the modern day Muslim world as seen in this WHO map of worldwide alcohol consumption (Fig 5).

Fig 5: WHO Map of alcohol consumption in the world (WHO, 2011)



As shown above, the pre-dominantly Muslim nations as of 2005 have the lowest alcohol consumption in the world. Again according to the WHO Global Information System on Alcohol and Health (GISAH), alcohol is a causal factor for over 60 major diseases and is responsible for 2.5 million deaths a year (more than HIV/AIDS and tuberculosis). Thus alcohol is responsible for about 4% of deaths worldwide (GISAH, 2013). Alcohol consumption is estimated to cause from 20% to 50% of cirrhosis of the liver, epilepsy, poisonings, road traffic accidents, violence and several types of cancer (WHO, 2011). In the UK alcohol cost the NHS £3.3 billion sterling in 2006-7 (Scarborough et al., 2011, pp 527 - 535). In another study from Albania (a predominantly Muslim nation), researchers found that religious observance was inversely associated with acute coronary syndrome (Burazeri et al., 2008, pp 937 - 945).

Thus it is reasonable to assume using modern day statistics that as alcohol consumption is lowest in Muslim nations, the same would apply at the time of the Caliphate and thus alcohol related diseases would be inversely proportional to alcohol use. Furthermore the economic burden of alcohol related illnesses would have been less on the Islamic welfare State.

4.1.3vii Quarantine measures:

One of the companions of the Prophet, Usama ibn Zayd reported that the Prophet said concerning the Plague Epidemic:

"If you hear that the plague has struck a land, do not enter that land, and if it breaks out in a land that you are residing in, do not go out of that area escaping from it" (Al-Bukhari & Muslim in Ibn-Qayyim, 2003, pp47).

To console the Muslims in a plague infested area, he said:

"The plague is a martyrdom for every Muslim" (Al-Bukhari & Muslim in Ibn-Qayyim, 2003, pp47).

Furthermore he said:

"A healthy man should not be brought near a sick person" (Abu Dawud & Ibn-Hanbal in Al-Bukhari & Muslim in Ibn-Qayyim, 2003, pp 130).

Hadith sources narrated that one of the Prophet's companions, Jabir bin Abdullah said:

"Thaqif's delegation included a man with leprosy. The Prophet sent to him "Go back, for we have accepted your pledge of allegiance" (Ibn-Majah & Ibn-Hanbal in Al-Bukhari & Muslim in Ibn-Qayyim, 2003, pp 130).

The above statements clearly show preventive measures against cross infection and the spread of infectious diseases. These concepts will be applied later by succeeding Caliphs.

4.1.4 Biomedical aspects of the Prophet's teachings that affect population health care:

In addition to health care policies, sources do provide data that the actual care of the sick was not left out by the Prophet of Islam.

4.1.4i Care of the sick:

The Qur'an states:

"There is no blame or restrictions on the blind, nor on the lame nor on the sick" (Qur'an 24:61).

This verse created the basis of the medical delivery system in the Islamic Welfare state. It categorically placed the patient as blameless and should be cared for. It removed the long lasting myth prevalent in many previous cultures that sickness was only a curse and that people who were sick were simply being punished for their actions.

Indeed the verse does not specify that the "no blame" is exclusive to Muslims only. The verse clearly does not specify religious, ethnic or gender inclusions or exclusions to the sick that is to be "blameless". The "secular" nature of the care of the sick is clearly stipulated in the verse. As this thesis would later show, the hospitals that were later built in the Islamic Caliphate were "secular" in nature as there was no discrimination towards the sick from the point of view of religion, ethnic group or gender. Indeed the staff of these hospitals were chosen based on skill rather than religious or ethnic affiliations.

Furthermore, the verse again provides the basis of support for the disabled as it mentions the blind and the lame in particular. The Qur'an here in one single verse had stipulated the

benefits for disabled persons. This formed the basis of Shariah with regards to the care of the disabled. Once more, it is clear that the Qur'anic Law stipulated the support for the disabled irrespective of their ethnic group, religious affiliations or gender.

In the section under the Righteous Four, this thesis provides the historical data that the above laws were indeed applied practically by the Caliphs with particular attention paid to ethnic and religious minorities and women. The framework and the actual support would continue to evolve and expand and in the Ummayad era, the benefits provided to the disabled were expanded further as the administrative capacity of the State increased.

4.1.4ii "Every illness has a cure":

The Prophet said:

"God has not sent down a disease except that He has sent down its cure" (Al-Bukhari & Muslim in Ibn-Qayyim, 2003, pp 122).

He also is reported to have stated:

"Every illness has a cure and when the proper cure is applied to the disease, it ends it, God Willing" (Muslim in Ibn-Qayyim, 2003, pp 122)

It has also been narrated that one of the companions of the Prophet by name of Usamah bin Shuraik said that the Bedouins came to the Prophet and asked him whether they should seek medicine. The Prophet replied:

"Yes O slaves of God, seek medicine, for God has not created a disease except that He has also created its cure except for one illness. They said: 'and what is that?' He said, 'Old age" (Ibn-Hanbal in Ibn-Qayyim, 2003, pp 25)

These sayings of the Prophet clearly told the Muslims to seek medicine and never to lose hope in finding a cure as every disease has a cure. This would stimulate later generations of the Caliphate to excel in the treatment of disease conditions and to create experimental research into treatment of diseases.

The above sayings of the Prophet complement the earlier verse of the Qur'an discussed in the last section. The myths that existed in many cultures including the pre-Islamic Arab culture that disease was a curse from the gods or spirits are again challenged by the above saying of the Prophet of Islam.

4.1.4iii Seeking the help of qualified physicians:

The Hadiths narrated that one of the companions of the Prophet by name of Sa'd ibn Abi Waqas said that when he was ill, the Prophet visited him and placed his hand on Sa'd's chest and said:

> "You are complaining from your heart. Go to Al-Harith ibn Kaladah from the tribe of Thaqhif, for he knows about medicine. Let him take seven dates from Medina, grind them with their seeds and then give them to you" (Abu-Dawud in Al-Bukhari & Muslim in Ibn-Qayyim, 2003, pp 92).

In this tradition, the Prophet refers the patient to a well-known skilled physician. Whilst the Prophet advised on a treatment, it is interesting that he did not consider it enough to administer his prescription but felt it necessary to refer to a doctor. The companions understood the value of skilled medical professionals as even their Prophet referred the sick to them. More interestingly, the physician the Prophet referred to was not a Muslim. This historical data further enforces the "secular" nature of medical practice stipulated by the Qur'an as discussed earlier.

In addition it is reported that a companion of the Prophet, Hilal bin Yasaf said:

> "The Messenger of God once visited a sick man and said 'Send for a doctor'. A man said, 'Do you say that O Messenger of God?' He replied, 'Yes, God has not sent down a disease but also sent down a cure for it" (Ibn-Hanbal in Ibn-Qayyim, 2003, pp 122).

The Prophet is also quoted as saying with regards to the cure:

"Those who know it are aware of it and those who do not know it are ignorant of it" (Ibn-Hanbal in Ibn-Qayyim, 2003, pp 122).

This in addition to the above traditions set the foundations for dedicated medical professionals within the Islamic State. These professionals were to be chosen based on their skill and not their religion as practiced and demonstrated by the Prophet of Islam.

4.14iv Seeking the best amongst qualified doctors:

One of the companions of the Prophet by name of Zaid ibn Aslam said:

"During the time of the Prophet, a man was injured and the blood was congested in the wound. The man then called 2 doctors from Bani Ammar to examine him. The man then claimed that the Prophet asked them: who is the best doctor among you? They asked: is there preferability in the medicine, O Messenger of God? He replied: the One who has sent the disease also sent down the cure" (Imam Malik in Ibn-Qayyim, 2003, pp 121).

The renowned 14th century scholar and historian Ibn-Qayyim ruled that this tradition indicated that Muslims should seek the best authority in each and every matter and field, because such expertise will ensure that the job is done with excellence (Ibn-Qayyim, 2003, pp 122). Later Caliphs would insist on the best doctors leading the major medical institutions in their time. Indeed, as would be shown later, the Islamic State would set its own exams for the certification of doctors.

4.1.4v Mental aspect of disease:

One of the companions of the Prophet by name of Abu Sa'id al Khudri reported that the Prophet said:

"When you visit a sick person, say good words to him, for the sake of God, for although it does not prevent any harm, it still brings relief to the person's heart" (Ibn-Majah in Ibn-Qayyim, 2003, pp 109).

This tradition has a strategic importance in understanding the medical delivery system within the Caliphate of Islam. It is significant from a medical point of view that the Prophet's instruction to visit a sick man was directly related to the sick's psychology. Muslim scientists and physicians would later incorporate clinical psychology and indeed psychiatry into their clinical practice and medical writings. The mental aspects of illness appeared very early in Muslim medical writings.

4.1.5 The union between religion and scientific medicine:

One of the companions of the Prophet by name of Abu Khuzamah reported that he asked the Prophet whether prayers against illnesses, the medicines patients take and the preventive measures against diseases change God's appointed decree. The Prophet replied:

"They are part of God's appointed decree" (Ibn-Majah, Ibn-Hanbal & Al-Tirmidhi in Ibn-Qayyim, 2003, pp 25).

The implications of these words are huge. In medieval times many people thought that attempting to cure the sick would be going against the wishes of the gods.

Here Abu Khumazah is asking the Prophet the position of Islam on this particular issue - with the exception of course that Islam is monotheistic. As Islam holds that God created the disease, would taking medicines or preventive measures go against God's wishes? Would not only God's divine intervention heal the sick? Here the Prophet's answer is clear. Taking medicines and preventive measures are part of God's divine intervention as He created the medicines too. Thus Islam included scientific discoveries as part of God's mercy on mankind and part of His intervention in curing diseases. Indeed a Qur'anic verse clears the issue as well with God promising to show His signs to mankind through knowledge of the Universe and the human body:

"We shall show them Our signs in the Horizons and within themselves until it becomes manifest to them that this is the Truth – is it not enough that thy Lord doth witness all things? (Qur'an: 41:53).

As such the Prophet commanded people to take medicine and take preventive measures to avoid diseases as part of their religious duties. Furthermore the zeal to discover new treatments was common among the Muslim physicians who saw it as a religious duty as well. That zeal for research was not exclusive to medicine only as the Qur'an had also stated:

"O Assembly of Jinn and Mankind, if you can pass beyond the zones of the heavens and the earth, then do so – but you will not be able to pass without authority" (Qur'an: 55:33).

Caliphs would later fund the building of observatories and academies of astronomy. Muslims scientists would later study the movement of the sun and the stars and would make calculations of the earth's movement that have been proven to be accurate by modern science. The zeal for knowledge and research was not exclusive to the medical sciences.

4.1.6 The Prophet and health promotion: analysis:

So far in this section, it has been shown that right from the beginning of the Islamic Welfare State the Prophet had placed the importance of health as second only to faith. It has to be understood that the Prophet not only spoke as a spiritual leader but also as a Head of State. His traditions and sayings formed State policy. Thus placing health at that high level urged the believers to seek all available methods to improve their health status. The early Muslim community stuck to the Prophetic advice of preventive medicine with emphasis on sanitation, dietary advice, physical exercise and avoiding intoxicants and maintaining high moral standards. They also sought out the best physicians when they were ill as promoted by the Prophet. The application of the State welfare system only further heightened the awareness of citizens to the importance of their physical and social well-being. The Prophet even initiated the mental aspect of disease as seen in the historical section.

Thus the physical, social and mental aspects of health were promoted by the Prophet as part of religion and State policy 1400 years prior to the WHO definition of health. In modern times, the subject of health promotion started to emerge during the 1970s and 80s as a force to prevent ill health (Wilson and Mabhala, 2009, pp 145). The Health Promotion Glossary developed by the WHO (Nutbeam, 1998, pp 349 - 364) has undergone several modifications. According to the WHO, health promotion currently guides global, national and community health policies contributing to reducing health hazards such as smoking, alcohol consumption, eating habits and physical inactivity (Smith et al., 2006, pp 340 - 345, Wilson and Mabhala, 2009, pp 146). The Caliphate promoted all these as part of State policy and religious practice.

4.17 Medical Legislation:

The Prophet said:

> **"**Those who practice Medicine, but are not knowledgeable in this profession are responsible for their actions" (Ibn-Majah, Al-Nisa'i, Abu-Dawud in Ibn-Qayyim, 2003, pp 124).

Using this saying, Muslim scholars of Jurisprudence have identified key legislative points to safeguard medical practice. These can be summarized as follows (Ibn-Qayyim, 2003, pp 124 – 126).

1. Unqualified doctors are held responsible for any health risks they cause.
2. An unqualified doctor that causes harm to a patient is financially liable.
3. A doctor who is proficient in his field and acts responsibly and treats a patient in a way allowed by the religion and has the sick person's consent, then commits a mistake, is not liable for this mistake.
4. If a patient knowingly goes to an unqualified doctor for treatment who then causes him harm, no compensation is offered to the patient by the doctor as the patient did

know that the doctor was unqualified. It however does not exclude the unqualified doctor in front of God on the Day of Judgement.

5. If a sick person unknowingly goes to an unqualified doctor and the doctor treats him without disclosing the fact that he is unqualified, then he is liable in front of the law.
6. If a qualified doctor who was given permission to treat a person but made a mistake and caused harm to a healthy organ (meaning not the organ he was treating), then in this case compensation is required. There is a difference of opinion on who should pay the compensation, with one opinion saying it should be paid for by the Muslim Treasury.
7. If a proficient doctor prescribes the wrong medicine for the sick person and the sick person dies, two opinions are given depending on circumstances. One offers compensation to the family from the State Treasury and the other gives compensation from the doctor's resources.
8. Finally if a proficient doctor operates on a child without the consent of the parents and causes harm, the doctor is required to pay compensation as he operated without permission. Interestingly the 14th century scholar Ibn al Qayyim gives the example of a doctor performing a circumcision on a child without the parent's consent and then damages the organ. He states that in this case the doctor is liable financially for his actions.

4.1.8 Death of the Prophet:

By 632 CE, two years after his triumphant entry into Mecca and unifying the Peninsula under one central Government of the Islamic welfare state, the Prophet fell ill. The illness was brief and the Prophet died in his house in Medina and was buried there. He had led the whole Peninsula for only a short while as its Head of State. Yet, over a period of 23 years, he had taught concepts and principles and in the last 10 years, he had

ruled Medina. The Prophet had left behind an elite group of companions that were taught by him. It was these companions that expanded the Caliphate beyond the boundaries of the Peninsula taking with them the principles and concepts of the Islamic welfare state. They were to come into contact with non-Arab nations and world civilisations. These companions were to use the principles and concepts they had learned over a 23 year period and with the Qur'an preserved, they were to begin the process of nation building on a massive scale.

The next section looks at these elite companions and their applications of the principles and concepts of the Islamic welfare state in nation building, welfare and healthy public policies.

Table 5 provides a summary of the key concepts that developed during the Prophetic era.

Table 5: Summary of the Public health care principles and their applications that the Prophet laid down in Medina.

Initiative	**Action**
The welfare state	Care for the needy and the poor
Preventive Medicine	Health Promotion
	Sanitation (special emphasis on personal hygiene especially hand-washing techniques)
	Rules on Sexual relations
	Dietary measures
	Ban on Alcohol and intoxicants
	Physical exercise
	Quarantine measures
Care of the sick	No blame on the sick
	Attempts should be made to cure
	Seeking help from qualified professionals
	Unifying religion with scientific medical care
	Mental Health care
Medical legislation	Defining the limits of the professionals
	Penalties for professional misconduct

Results/Discussion

Chapter 4

Section 2: The Era of Abu Bakr

In this chapter, the following topics will be highlighted:

1. An introduction to the first Caliph of the era and his personality
2. His welfare policies will be narrated and analysed
3. Significant historical events in his period that may have affected public health

4.2.1 The First Caliph - Abu Bakr:

His rule started immediately after the death of the Prophet Muhammad in 632CE. He was the foremost companion of the Prophet and his father-in-law. In the pre-Islamic era, Abu Bakr was a wealthy Meccan businessman. He was a close friend of the Prophet even before Prophethood. Abu Bakr believed that his friend was indeed the Prophet sent by God (Salabi, 2006b, pp 16). He remained by his side throughout the 13 years of persecution in Mecca. During that period, Abu Bakr used his wealth to buy and free slaves that Quraysh had persecuted for their conversion to Islam (Salabi, 2006b, pp 36). On many occasions, he himself was physically attacked alongside the Prophet (Salabi, 2006b, pp 34). When the Prophet finally migrated to Medina, it was Abu Bakr who accompanied him on this journey.

In Medina, he again was the Prophet's chief advisor and helper. During the final days of the Prophet's illness, he instructed that Abu Bakr should lead the Muslims in prayer. After the Prophet died, Abu Bakr became Caliph.

He ruled the Caliphate for 2 years. These were plagued by several rebellions of Arab tribes in the Peninsula that mutinied upon the death of the Prophet (Jackson, 2006, pp 10). It was a critical period of the newly appointed Caliph as the bulk of his army had departed on a mission to fight the Romans (Salabi, 2006b, pp 165). The rebels were however defeated by the residual forces of Abu Bakr. By the end of his second year, the Peninsula was once again united under a single rule by the Caliph in Medina (Jackson, 2006, pp 12).

4.2.2 Leadership style:

As the first Caliph after the Prophet, he immediately continued the Islamic rule instituted by the Prophet. The Caliph's landmark statement to the people in his first sermon after inauguration laid down the principles of his reign as well as the reign of those to come after him.

"If I do well, help me and if I do evil, correct me" (Salabi, 2006b, pp 130; Ibn-Katheer, 1988, Vol 6, pp 305).

This statement immediately gave the Muslim community the right to monitor the Government officials at the highest level and indeed to correct and if necessary to use force to thwart any evil any government official may perpetuate including the Caliph himself.

He also clarified his stand on justice and standing by the weak in his statement:

"The weak among you is strong in my sight until I get his rights and the strong among you is weak until I take from him the rights that he took from others"(Ibn-Katheer, 1988, Vol 6, pp 305; Salabi, 2006b, pp 131).

This re-enforcement of the rights of the weak further rooted the principles of the welfare state instituted by the Prophet. The Caliph himself lived an austere life style. The one time rich businessman of Mecca now finding himself in-charge of the young Islamic State confined himself to a meagre monthly stipend to set an example for future rulers (reference).

4.2.3 Setting up the State Departments:

Abu Bakr is credited with setting up a dedicated building to house the wealth of the State. This included money, animals and other wealth that belonged to the State. Abu Bakr was meticulous in the distribution of State wealth to the people who were in need (Salabi, 2006b, pp 133). State officials were appointed to act as auditors and accountants of this State Treasury and they received salaries from the State as stipulated by the Qur'an.

The Baitul Mal was a landmark development in the Islamic State as it provided efficient and accurate accounts of the income and expenditure of the State and helped plan future projects of the Government. In later decades this institution greatly evolved and each province under the Caliphate had its own Treasury House. As would be shown later, the State was successful in preserving the records of its income and expenditure which are fortunately present till this day.

Abu Bakr set up three further main government Ministries with official ministers. The first was the Minister of Finance and Welfare who looked after the Treasury House. This was Abu Ubaidah Ibn Jarrah, a senior companion of the Prophet Muhammad. The second was the Minister of Justice which was Omar ibn Al Khattab (himself to become the second Caliph). Zeid ibn Thabit was appointed Minister of Postal Services and Communications (Salabi, 2006b, pp 139).

4.2.4The Welfare Sector:

Abu Bakr continued the welfare system that had already been placed by the Prophet. Further applications and principles were applied in his era as follows:

4.2.4i Distribution of wealth:

Historical records show that he did not distinguish between slave and master, male or female, children or adults. Indeed, historians have recorded that in his first year, he gave every needy man, woman, slave or child 10 dirhams. In his second year, he gave them 20 dirhams each. Thus the welfare system set up by the Caliph clarified that there will be no distinction between man and woman in the State's benefit's system (Tantawi, 1986, pp 186 – 187; Salabi, 2006b, pp 133).

The Caliph bought camels and horses to be placed in the State's finance house for use as necessary by the poor. The total amount of money spent by Abu Bakr on the State Benefit's system in his 2nd year as Caliph is estimated by historians to be about 200,000

dirhams (Salabi, 2006b, pp 134). The wealth was distributed between men, women, free men and slaves all in equal shares which led some companions to object on the lack of stratifications within the distribution of State benefits. Abu Bakr however insisted on the equality of shares (Ahmad, 1984, pp 1).

It is interesting to note that the benefits doubled in his second year and the historical accounts accessed do not provide an explanation. However a plausible explanation was that the first year was plagued with the internal mutiny with some tribes refusing to pay their taxes to Medina. It would be expected that population health at the time may have deteriorated due to the lack of peace in the Peninsula. Peace is a social determinant of health and the wars fought in the first year would have affected the health of the population. These wars must have also caused an increased expenditure on military activities reducing the amount of money spent on welfare.

The converse is also true. As the wars reduced in the second year and with tribes submitting to the authority of Medina with the resultant increased income from taxes, the expenditure on social welfare naturally increased. This may explain the doubling of the welfare benefits in his second year of rule.

4.2.4ii The State's winter benefits:

In one year, he bought special types of heavy clothes from the Bedouin tribes and distributed them to the poor widows of Medina during the winter (Salabi, 2006b, pp 134). The winters in the Peninsula could be exceptionally harsh and the poor would naturally not be able to afford to keep warm in such weather conditions. The resultant effect on health during the winter months would have been detrimental and it appears that the Caliph understood the implications on population health especially on the poor and the needy. His action of providing warm clothes in the winter would potentially have prevented the many illnesses that the cold desert weather brought on the population.

The above can be analysed using modern day knowledge of public health. The correlation between winter cold and mortality has been studied in modern times. Research has also focused on fuel poverty and its relationship with winter mortality. Research has shown that there may be supporting evidence of a relationship between energy insufficient housing and winter respiratory disease among older people with public health implications. These detrimental outcomes have been the major forces for increasing health-driven energy efficiency housing interventions amongst the vulnerable including the elderly and children (Rudge and Gilchrist, 2005, pp 353 - 358). In the UK, criteria have been developed to allow the homes of the vulnerable to have special funding to be heated in the winter. However, a study called for redefining these specific criteria for eligibility for fuel poverty grants and tackling heat inefficiency in privately owned homes. These homes under the current criteria were not eligible for home heating improvement despite fulfilling other criteria for vulnerability (El Ansari and El-Silimy, 2008, pp 289 - 294). Another report looking at Excess Winter Mortality (EWM) in Europe showed that high seasonal mortality in southern and Western Europe could be reduced through improved protection from the cold indoors:

> "increased public spending on health care, and improved socioeconomic circumstances resulting in more equitable income distribution" (Healy, 2003, pp 784 - 789).

It appears that Abu Bakr in his equitable distribution of State funds and identifying a particular group of vulnerable individuals (in this case poor widows) may have taken into consideration the above mentioned factors discussed in modern day literature.

A further modern analysis could provide a possible understanding of the mortality that may have been reduced by the winter policy implemented by Abu Bakr. The UK Office of National Statistics provides yearly figures of mortality in the winter season in the UK. The following figures are culled from the Office of National Statistics statistical bulletin:

"An estimated 31,100 excess winter deaths occurred in England and Wales in 2012/13 – a 29% increase compared with the previous winter. As in previous years, there were more excess winter deaths in females than in males in 2012/13. Between 2011/12 and 2012/13 male excess winter deaths increased from 10,590 to 13,100, and female deaths from 13,610 to 18,000. The majority of deaths occurred among those aged 75 and over; there were 25,600 excess winter deaths in this age group in 2012/13 compared with 5,500 in people aged under 75" (ONS, 2013).

The above figures show the importance of providing adequate warmth in vulnerable age groups. It has to be noted that these figures are from a highly developed nation and not a developing country. The UK is clearly technologically advanced and with the advancements in housing, one would expect much lower winter mortality. The figures show the importance of providing adequate warmth during the harsh cold weather. The lack of technology 14 centuries ago would have meant that a relatively higher mortality would have occurred in the Arabian Peninsula during the winter months.

A critical analysis of the above historical data in the context of state policy in that era would suggest that the fact that the policy came directly from the highest level of the State – the Caliph – rather than a provincial governor or a State official could indicate the severity of the problem. It is plausible to assume that there was a high mortality during the winter months in the Arabian Peninsula that would have prompted the Caliph to implement such a policy. Interestingly it appears that the gender mostly affected during Abu Bakr's rule is the same as that in the modern UK.

4.2.4iii Care of the weak – Personal example:

The Caliph set a personal example for the care of the weak. Prior to his election as Caliph, he had set himself the task of helping a group of poor people in the neighbourhood by milking their animals for them. When he became Caliph, he heard one of the women

complain "Now no one will milk our animals for us". The Caliph immediately swore to continue doing so himself and he kept his oath (Ibn-Saad, 1968, Vol 3, pp 186; Salabi, 2006b).

This episode was well-known to the companions of the time and served to show that the supreme ruler of the Islamic State was really the nation's servant. As previously mentioned, his austere way of living, despite his past riches, only served to strengthen the principle of national service amongst state officials.

In another episode, the Caliph had taken it upon himself to personally do the errands of an old blind lady in the suburbs of Medina. He would fetch water for her and clean her home himself (Salabi, 2006b pp 142; Tantawi, 1986, pp 29).

4.2.5 Legislation of child care in cases of parental divorce:

Abu Bakr's Minister of Justice Omar Ibn Al Khattab had divorced his wife and had left an infant son with her. When the child had passed infancy, Omar saw the boy and decided that it was time that the child came to live with him. The child's mother disputed and as Omar was Chief Justice, he could not enforce a ruling in a case that involved him personally. The case was then taken to the Caliph Abu Bakr. Abu Bakr ruled in favour of the child's mother telling Omar:

> "Life with her is better for him than life with you until he reaches puberty and then he can choose for himself. She will display more kindness and mercy to him than yourself and she has more right to him than you unless she re-marries" (Abdel-Razzaq n.d, Vol 7, pp 54, Salabi, 2006b, pp 150).

Here it is noteworthy that the Caliph sided with an ordinary woman against his own Minister of Justice.

Abu Bakr died in 634 A.D. He ruled for only 2 years – a large part of which was involved in dealing with the rebellions. Before he died, he took the opinion of his consultative

assembly – the Shura – on the appointment of the next Caliph. The decision was taken for Omar Ibn Al-Khattab to become the next Caliph (Salabi, 2006b, pp 366).

Table 6: Summary of the welfare system at the time of Abu Bakr

Initiative	**Action**
Continuation of the Prophet's principles	The Welfare state continues to develop
	Transparent and Honest leadership
	Initiation of the Treasury House
	Initiation of defined departments in the State
	Welfare comes under the Department of Finance
	Direct payments of State benefits to the needy
	Initiation of State sponsored transport facilities
Winter Benefits	Distribution of winter clothes to the poor widows
Care of the weak	By state benefits and personal example
Care of the Aged and the Blind	By State benefits and personal example
Child care legislation	Benefits paid to care for children
	Child custody in case of parental divorce

Results/Discussion

Chapter 4

Section 3: The Era of Omar Ibn Al-Khattab

In this chapter, the following topics will be covered:

1. The personality of the second Caliph will be summarised
2. His welfare policies will be identified and analysed
3. The process of nation building in his time
4. The health disasters that occurred in his era and the State response
5. A modern analysis of the State response to the disasters will be provided

4.3.1 Omar Ibn Al-Khattab as Caliph:

Omar succeeded Abu Bakr as Caliph in the year 634AD. He ruled for a total of ten years that saw the caliphate rise from the boundaries of the Arabian Peninsula to conquer the Persian Empire, the whole Middle East and taking most of North Africa from the Romans. In addition the city of Jundashipur which housed great learning academies of the Persian Empire fell to Muslim armies in 642CE under Omar's rule (Cordell & Gumerman, 2006, pp 371).

The caliphate rose to be the most powerful force in the Mediterranean and the near East. Omar was also known by the title Al-Farouk meaning he who differentiates between right and wrong. This title was given to him by the Prophet Muhammad (Salabi, 2005a, pp 12). He was a foremost companion of the Prophet having believed in him during the initial years of persecution in Mecca. Omar initially opposed the Prophet and was indeed involved in an attempt to assassinate him (Jackson, 2006, pp 13). He however later believed in him and became one of his closest companions. The Prophet later married Omar's daughter Hafsa (Salabi, 2005a, pp 58).

4.3.2 Leadership style and Government:

Omar continued the leadership style of Abu Bakr. Again the Qur'an and the traditions of the Prophet Muhammad formed the basis of the Government.

In his first speech as Caliph, he said:

"I shall be tough on those who commit injustice against others and I shall not leave anyone to commit any injustice against another….I shall be lenient and at the service of the pure and chaste people and the poor…..and if any of you is on military service, then I am responsible for his children until his return…" (Salabi, 2005a, pp 208).

The Caliph went on to outline the rights of the people on him. In addition to those created by Abu Bakr, more state departments called Dewaween (singular: Diwan) were created. These included the Land Tax Department, the Military Department and the Population and Census Department (Al-Numani, 1998, pp 328). In addition, a State department of Education was set up with branches in all provinces as will be discussed later.

4.3.3 The welfare system initiated by the Caliphate in the time of Omar:

4.3.3i Tax exemptions to the poor from the non-Muslim populations and their entitlements to State benefits from the Islamic Government:

Omar once saw an old and blind man and asked him about his state of affairs. The man replied he was a Jew and he was looking for help to pay his taxes. The Caliph instructed that the man should be exempted from his taxes. He further ordered that the man be given State benefits. He then sent orders to all the governors of the provinces that the poor amongst the non-Muslims be exempted from taxes and be entitled to State benefits (Salabi, 2005a, pp 97).

This step taken by the Caliph demonstrates the strong sense of social justice and equity that the Government applied to the population. Considering that the Caliphate was clearly multicultural with diverse ethnic groups and religions, this action promoted equality with regards to State benefits for the underprivileged citizens irrespective of tribe or religion. It enforced the principle that below the poverty line designated by Islamic Law, Muslims and non-Muslims would be treated alike.

It is well known that social justice and equity are in themselves social determinants of health and the historical data demonstrates that these two social determinants of health were not exclusive to Muslims alone but to the whole population.

4.3.3ii Benefits for the needy and the disabled:

These were paid in a more organized manner in the time of Omar. His instruction to his officials in charge of the Treasury House was to deliver the benefits to Muslims and non-Muslims alike (Al-Numani, 1998).

Salaries were paid to all disabled individuals in all the provinces during the Caliphate of Omar from the State Treasury House (Al-Numani, 1998, pp 372).

The health of disabled individuals has been proven to be directly related to their income. In the UK, the disability living allowance was introduced in 1992 and was replaced in 2013 by the Personal Independence Payment (PIP). The allowance in the UK has 2 components: mobility and care. Individuals can claim one or both. The allowance is not means tested and is tax free (NHS, 2014). It is open for anyone whose normal home is the UK. The UK Government has been criticised in the decision to replace the disability living allowance with PIP. Research has shown that under the new scheme, disabled people may lose up to £28 billion by 2018 affecting 3.5 million disabled people with deleterious effects on health (Cross, 2013, pp 719 - 723).

The problem of ethnic group differences in accessing benefits also occurs in the UK benefits system. Indeed in 2007, researchers in the UK showed that some ethnic minorities, such as Bangladeshi and Pakistani groups, were less likely to be in receipt of their legitimate disability allowance when compared to the white population. This was due to ignorance of the right to claim and the perception that the process in complex in addition to the disabled wishing to conceal their disability (Salway et al., 2007, pp 907 - 930).

There are striking similarities between the research above conducted in the UK and the historical data provided. The Jew that Omar saw was clearly belonging to a religious minority. This Jew who was blind did not ask for either tax exemptions nor disability allowance until the Caliph spoke with him. This may have been due to ignorance that he was actually entitled by Islamic Law for such benefits. The concept of ethnic or religious minorities having problems in accessing the benefits scheme seems to be an age long problem. A further critical analysis of the historical data shows that the Caliph did not just satisfy himself by exempting the blind Jew from the taxes or providing him with benefits but sent orders to all the provinces to do the same. It is apparent that the Caliph was worried that the blind man was not a special case but that many ethnic and religious minorities in the Caliphate may have been deprived of their legitimate benefits due to ignorance. This was contrary to the Islamic Constitution ruling the Caliphate and Omar as custodian of the Law was keen to make sure that the disabled and the needy received their benefits irrespective of their religious or ethnic backgrounds as has been discussed previously with the Qur'anic verse that dealt with this particular issue.

4.3.3iii Unemployment benefits and benefits to abandoned children and orphans:

Salaries were paid to unemployed individuals in the State. Careful statistics were undertaken by the State to have accurate figures for unemployed and disabled citizens. In one report, the military department had 700,000 individuals recorded in its State benefits records (Al-Numani, 1998, pp 372).

The Caliph ordered that all abandoned children wherever they were came under State protection. All the children's needs were to be borne by the State. Initially each of these children received 100 dirhams yearly and this was increased year by year by the State (Al-Baladhuri cited in Al-Numani, 1998, pp 374).

State benefits were also paid to orphans who had no inheritance. Orphans who had inheritance came under the protection of the State alongside their wealth. Omar issued orders to preserve the wealth of orphans. In addition, Omar gave orders that this wealth should be used in trade and the profits thereof be added to the orphan's wealth. In one episode he gave to one of his officials by name of Alhakem ibn Abi Al'as 10,000 dirhams of orphans' wealth that was under the care of the State. The official invested the money and in time the wealth got to 100,000 dirhams. Orphans reclaimed their wealth (capital and profit) when they reached adulthood (Al-Numani, 1998, pp 374).

Income support to orphans has been linked to their health and nutrition. This particular group of vulnerable children in the absence of a strong State support system could find themselves prone to several illnesses. In a research conducted in the 2004 in Zimbabwe, due to the high level of mortality due to HIV/AIDS, almost a third of children under the age of 4 were orphans or vulnerable children. Due to extreme poverty, these children were found to be more likely to have suffered diarrhoeal illness, be stunted and underweight compared to non-vulnerable children (Watts et al., 2007, pp 584 - 593).

Even in the 20th century in many societies, the wealth of children is lost after the death of a parent. In research done in Uganda, the number of orphans in the 1991 census was 44,000. The research found that in many cases, after the death of the father or husband (usually from HIV/AIDS), the other relatives took over the money and the land and indeed the widow and the orphans are chased away from their home and land. The research warned that in many cases the mother may die as well. This according to the research leaves the orphans:

> "homeless, landless, and uneducated in a context where 90 percent of the population depends upon subsistence agriculture" (Roys, 1995, pp 346).

Furthermore the research emphasised the role of legislation stating that there were three main regulatory mechanisms of inheritance in the city of Rakai in Uganda (the site of the research) – wills, customary law and statutory law (Roys, 1995, pp 346 - 351).

The administrative mechanisms placed by Omar are in stark comparisons with the above two articles. In Omar's era, the orphans came directly under State protection. In cases where orphans had been left a property, the State Law not only preserved the wealth of these orphans but clearly invested it to increase the wealth of the orphan.

4.3.3iv Welfare of women:

Omar's Government expanded its care for women and their daughters and the aged women. They received their due benefits from the State. Women received a yearly stipend from the government of between 200-500 dirhams (Hasan-uz-Zaman, 1991, pp 303). He made sure that all widows received their due benefits timely. Special dispensation was given to the families whose men were on military service. The Caliph made his popular speech:

"By God, if God Wills, I will not leave the widows of Iraq to need anyone after me".

(Salabi, 2005a, pp 131).

In a particular case example, when the four sons of a woman by name of Khansa were killed in battle, she received a benefit of 200 dirhams on each son each month totalling 800 dirhams monthly till she died (Salabi, 2005a, pp 134). This again can be compared with the research from Africa cited in the previous section where widows were chased away from the land of their husbands with their children.

The Caliph like his predecessor struck a personal example to illustrate his Government's care for the welfare of women. He would visit the homes of the families of the men who were in military service. He would ask their women 'Is there anything you need? Do you need to buy anything from the market? I dislike that you should suffer in the market place'. The women would then send him to the market with a list of their needs alongside

servants. The Caliph would buy their needs and alongside the servants return the goods back to the houses (Al-Numani, 1998, pp 377)**.**

When the postal officers arrived in Medina with letters from the soldiers to their families, Omar would personally deliver the letters to their homes and inform the women of the date the postal officers would return back to the soldiers. He would supply the women with writing materials from the State treasury. For women who could not write, Omar would sit down at their doors and have them dictate to him the letters they would want to send to their men (Salabi, 2005a, pp 135; Al-Numani, 1998, pp 377)

4.3.3v Child care:

Omar advanced the child care programme in his Caliphate. He declared that every child must receive a benefit from the State once the child was weaned. One night, as he was inspecting the city of Medina, he noticed a caravan and heard a baby crying. The Caliph approached and saw a baby crying in his mother's arms. The Caliph questioned the mother on the reason for the baby's distress and received no reply. The woman had not realised that the man questioning her was the Caliph Omar. As Omar persisted without disclosing his identity, the mother angrily replied that she was trying to wean the child early so as to receive the benefits for her child because "that man Omar" would not release the money prior to weaning. The Caliph seriously regretted his action and changed the rules to allow benefits to start from the date of birth of the child (Al-Numani, 1998, pp 379). Thus parents were asked to bring their new-born children to the provincial welfare department to register their children and claim the benefits. Initial payments were 100 dirhams yearly per child (Hasan-uz-Zaman, 1991, pp 303). The Caliph ordered that the new policy be adopted in all the provinces (Salabi, 2005a, 160; Ibn Katheer, 1988, Vol 7 pp 140)

The above historical data provides the researcher with more insight into the recordings of the medieval Muslim chroniclers. This incident records an error on the part of

the Caliph in enacting the child care programme that he corrected after being literally shouted at by a citizen. There are many other recordings of errors made by the Caliph Omar and other caliphs especially in the field of jurisprudence. The recording of these errors has a historical significance from a research point of view. It shows that these chroniclers were not just recording the "good" aspects of these Caliphs but also recorded their errors as well. This is historical research gives some form of validity to the recorded data of this era.

4.3.3vi Travelling Practises:

The Caliph ordered the construction of several highways to connect the caliphate's provinces with each other. In addition he instituted a policy of freedom of movement. In accordance with the laws of Islam, the Caliph ordered for care and well-being of the traveller. The Qur'an commanded:

"You shall give the due alms to the relatives, the needy, the poor, and the travelling alien, but do not be excessive or extravagant" (Qur.an 17:26)

In addition, the Quran commanded:

"Alms are for the poor and the needy and those employed to administer the funds, new converts, for those in slavery, for those overburdened by debt and for the travelling alien: thus it is ordained by God and God is full of knowledge and wisdom" (Qur'an 9:60)

Special camels belonging to the state were placed on these highways to aid stranded travellers to get to a safe destination. These camels were stationed initially between the Peninsula and Iraq and Syria – Palestine. They however expanded the system to include all provinces under Islamic rule (Salabi, 2005a, pp 210).

Once more it is worthy of note that the instructions of the Qur'an are not exclusive to Muslims. Indeed in Omar's time, the majority of the population in Syria were non-Muslim.

The Caliph was very interested in constructing roads within each province as well and provincial governors were under special orders to ensure that such roads were constructed in

their provinces. One such command is recorded for the city of Nahawand in Iraq. The command of the provincial governor was:

> "In the name of God Most Gracious, Most Merciful. This is the pact between Huzaifa ibn al Yamani and the people of Mah Dinar. He has granted them security with regards to their lives, their property and their lands. They do not have to change their religion and no restrictions will be placed on them with regards to their religious practices and they are under full Muslim protection – so far as they pay their taxes each year to their Muslim governor – these taxes will be according to the means of each adult. They must help the traveller and the roads must be repaired and they shall host Muslim armies when they pass through their land for one day and one night only and they shall give true advice but if they break this treaty our duties towards them are null and void. This pact was witnessed by Alkaka' ibn Amr and Naim ibn Maqran in the year 19AH (641AD)."
>
> (Salabi, 2005a, pp 210).

Such treaties were expanded throughout the provinces. The Caliph was keen to expand trade via road reconstructions but never ignored the welfare of the traveller.

Providing camels for transport was not the only measure the Caliph took. The Caliph ordered the constructions of several houses known in his time as "Dar Al Daqeeq" or literally meaning "The House of Flour". These were state owned bakeries on the highways that contained food and rest places. The food usually consisted of dried dates and sultanas and flour. These were placed on the highways for travellers to be catered for on their journey. The Caliph ensured that travellers needed neither food nor water on their journey but that the State provided these necessities for them (Salabi, 2005a, pp 210). These rest houses are analogous to the Rest Houses in the present day modern era that are found on major highways in the developed countries. There are however 2 major differences. Rest houses in the modern era are mostly private owned. The rest houses of Omar were State owned. Travellers in the

modern era pay for food and rest. In Omar's time, food, water and resting areas were free of charge for the travellers and the State paid for the expenses. We do have another record of a pact between a provincial governor and his people in the time of Omar:

> "In the name of God Most Gracious Most Merciful. This is a pact between Aiad ibn Ghanem and the Christian Priests of Raha. You have opened for me the doors of your city and that your taxes will be a Dinar on each man and a weight of wheat. Thus you are granted security for your lives and your property and security for all those that follow you. You must guide the lost traveller and you must repair the roads and the bridges and you must give true advice to the Muslims and God is Witness (Salabi, 2005a, pp 211).

4.3.3vii Cooked Food and Housing:

The Caliphate set up general kitchens in most of the cities. These kitchens cooked food and distributed them accordingly to the poor, needy and the travellers. The Caliph used to supervise the general kitchen in Medina personally (Al-Numani, 1998, pp 373).

The Government recognised the rights of individuals to own houses. The security of these homes was the responsibility of the State. This extended to non-Muslims as well. Indeed if for any reason, the State took any privately owned lands (be it for political or security reasons), Omar's Government paid the exact compensation to individuals for the take-over of their lands. For instance when the Government decided to expand the area around the Holy House in Mecca due to the increased number of pilgrims, privately owned lands around the precincts of the holy house were bought by the Government from those individuals (Salabi, 2005a, pp 101).

A specific analysis of food and housing will be discussed in the chapter which deals with specific social determinants of health during the era of the Righteous Four.

4.3.4 Nation Building

4.3.4i Department of Education:

As part of the welfare state, the Caliph created an education system sponsored by the State. These consisted of schools (or Katateeb) to teach people the Arabic language (the language of the State) and the Islamic sciences including the Qur'an and the traditions of the Prophet Muhammad. Schools were set up in cities like Mecca, Medina, Basra and Kufa. More schools were built in the provinces of Sham and Egypt. These had designated officials in charge of the various schools and we have the names of these officials. For instance, the Shami department had Muadh ibn Jabal, Ubada ibn Samet and Abu Dirdaa as the main officials in charge (Salabi, 2005a, pp 187).

Education is a major social determinant of health. These departments of education not only taught the principles of Islam but also taught the Arabic language which became the official language of the Caliphate. These schools formed the first step of unifying the existing cultures within the realm of the Caliphate under one language system. This would play a huge part in the later eras in transferring knowledge and skills between these cultures. Indeed one needs to look at the English language today which is the most used language in the field of medicine and health care and how the use of a single dominant language can aid the rapid transfer of knowledge from one nation to another.

4.3.4ii The construction of water ways and the supply of water:

The Caliph ordered the construction of several waterways as a means of transportation, to supply water to city inhabitants and for agricultural purposes. Dams were constructed and artificial lakes created. He created a special government department to manage the distribution of water (Al-Numani, 1998, pp 247).

The following examples are documented historically.

a. The waterways of Egypt

The Caliph heard that there used to be a gulf of water between the River Nile and the Red sea which then connected mainland Egypt with the Arabian Peninsula. He was told that the Romans had neglected that gulf and it no longer existed. He ordered his governor Amr ibn Al As to reconstruct the gulf. This was done and once again a waterway between the then Egyptian Capital of Fustat (in modern day Cairo) and the Arabian Peninsula was made. Trade flourished with the construction of this canal. Amr called it "the Gulf of the Commander of the Faithful" or in Arabic "Khaleej Ameer al Mo'mineen" (Salabi, 2005a, pp 211; Sharkawy, 1988, pp 254 - 255). This canal was to serve later as a channel of food between both countries and caused the price of wheat in the Peninsula to be the same as that in Egypt (Al-Numani, 1998, pp 267). This river was about 69 miles long and it took about 6 months to complete (Al-Numani, 1998, pp 268). Unfortunately centuries later, this canal was again neglected and finally dried up completely in the time of the Ottomans.

The Caliph ordered the building of special dams in Egypt to store and supply water to the cities. Historians have placed the number of employees involved in the construction of water dams and canals in Egypt at 120,000 (Al-Numani, 1998, pp 247). Work was on a daily basis all year round to get water supply to the cities. The expenses and worker's salaries were all paid by the State (Al-numani, 1998, pp 247).

a. The waterways of Iraq and the pilgrims' route:

He built a waterway connecting the Tigris River to the newly founded city of Basra to ensure that the inhabitants had access to fresh water (Salabi, 2005a, pp 213). This river was about 10 miles long (Al-Numani, 1998, pp 272). In addition his Governor of Khozestan with its capital Ahwaz (cities in present day south west Iran), Juzr Ibn-Muawiyah had the Caliph's permission to build several waterways and rivers

in the region (Al-Numani, 1998, pp 247). One of the Caliph's officials by name of Mu'aqal Ibn-Yasar constructed another water channel from the Tigris River. This river became well known as the River of Mu'aqal (Al-Numani, 1998, pp 266). The inhabitants of the city of Anbar in Iraq had previously asked the Emperor of Persia to help them dig a river in the city. When Omar's forces defeated the Persians and the city came under the Caliphate, the people made the same request to his Governor over the city of Kufa by name of Sa'ad Ibn-Abi-Waqas. Sa'ad ordered his official Sa'ad Ibn-Omar to construct the water channel for the people. A long river was dug up and stopped only at the foot of the mountain. This river was called the river of Sa'ad. The Ummayad governor Al-Hajjaj Ibn-Yousef would later create a mountain pass for the river to flow through (Al-Numani, 1998, pp 267).The pilgrims' route between Mecca and Medina was certainly a very busy one. The distance between the two cities is about 210 miles. The Caliph ordered (after returning from Mecca to Medina by this route), the building of shades and wells in all the rest places along that route. In addition, all existing wells had to be cleaned up and purified. Rest houses that already had wells but the wells did not have enough water in them had new wells dug up (Al-Numani, 1998, pp 271).

4.3.4iii Food production and Agricultural reforms:

The Caliph paid special attention to increasing agricultural production. He enacted laws that allowed people to own lands that were otherwise barren and uninhabited provided they repaired the lands and started agricultural cultivation. However if after three years, the lands did not produce, the land will be reclaimed (Al-Numani, 1998, pp 247). Indeed, the Caliph ordered that lands abandoned by their owners due to military conflict; the owners could now return and reclaim their lands. The Caliph's interest in Agriculture was illustrated in another personal episode when a farmer came to complain to him that his farmland was

ruined in Sham when "your armies passed by it", the Caliph instructed that the farmer be paid 10,000 dirhams in compensation (Al-Numani, 1998, pp 247).

The results of increased food production stimulated the economic growth of the State and special taxes were placed on agricultural estates and their production. The affluence of the Caliphate allowed the Government to continue and expand its welfare programmes (Hasan-uz-Zaman, 1991, pp 303). The third Caliph Uthman used the economic foundations placed in the era of Omar to almost double the entire benefits in the welfare State. This will be discussed in the next chapter but will also be discussed in detail later in the thesis under the "The Economic Functions of the Islamic State".

4.3.5 Disasters in the time of Omar ibn Al Khatab with public health consequences:

The historical chroniclers do provide data on disasters that happened on a large scale within the civilian population of the Caliphate in Omar's era. The medieval historians have documented many details of these disasters providing the researcher with a rich data collection of these disasters and an analysis of these from a public health perspective is provided for the first time by this thesis.

4.3.5i The Fires of Basra and Kufa:

In the year 639CE – 640CE, large fires erupted in both cities (in modern day Iraq) and many houses were burnt. The houses in these newly founded cities were built from wood. In Kufa alone 80 homes were burnt. The Governor of Kufa, by name of Sa'ad ibn Abi Waqas, wrote to the Caliph asking him for permission to allow a reform of the materials used in the building of houses. After due considerations, it was decided that the houses will be rebuilt using stones and mud and should not be higher than necessary for safety and combustion reasons (Al-Numani, 1998, pp 274; Al-Tabari, 1987; Vol 5, pp 15; Salabi, 2005a pp 216).

Whilst it is not recorded if deaths did occur in these fires, considering that the same chroniclers did record death rates in other disasters, it unlikely that significant deaths did

occur. However this cannot be verified using the historical data available. In addition, it is not recorded whether there were any injuries and the severity of these injuries but looking at the scale of the disaster and the number of homes burnt it is likely that injuries did happen.

It is probable that the fires must have been significant as it caused an almost instantaneous legislation in the design and material for houses and safety measures were put in place by State Law.

4.3.5ii The Year of famine:

In about the year 639CE as well, a famine struck the Arabian Peninsula (Al-Numani, 1998, pp 374). The welfare system was tested by the calamity of 639 CE, a year known to Muslim historians as the 'Year of Ramada' (Salabi, 2005a, pp 222).

a. Events:

In the Year of Ramada, due to lack of rains, a famine gripped most areas of the Arabian Peninsula and lasted for nine months (Sharab, 1994, pp 37 - 38). The acute shortage of food forced most of the desert tribes to flock around the capital city of Medina. Immediately the Caliphate declared a full scale response to this humanitarian crisis. The Caliph Omar affirmed publicly that it was his responsibility and the responsibility of his Government to deal with and manage the situation (Ibn-Katheer, 2004, Vol 7, pp 97).

b. Government Strategies in 639 CE:

1. Refugee camps and refugee committees:

The Caliph's administration promptly created emergency refugee camps within and outside the city of Medina (Salabi, 2005a, pp 224). An early first step the government undertook was to assess and monitor, on daily basis, the numbers of refugees arriving to the camps. The modern day scholar of Islamic history, Salabi cites the well-known medieval scholar and chronicler Imam Dhabi who recorded that in the first registry, 7000 men and 40,000 children and sick people were recorded as arriving to the capital in search of food aid.

Within a few days the number rose to 60,000 people (Dahabi,n.d, pp 274; Salabi, 2005a, pp 224).

2. **Levels of responsibility and resources for action:**

The Caliph delegated the work amongst his officials to oversee the care and wellbeing of these refugees (Qadri, 986, pp 107 – 115; Salabi, 2005a, pp 224). Every official was ascribed specified duties, along with the resources and facilities in order to carry those duties. These duties included the numbering of refugees in each camp and the daily rationing of food and supplies to these camps. Officials supervised their designated camps daily attending to the needs of the masses. By evening, officials met with the Caliph to provide progress reports on various aspects of the camps (Salabi, 2005a, pp 224).

3. Food Aid:

Bakeries were set up using state funds to prepare food for the refugees. This food was distributed by the officials and the Caliph took part in the distribution himself. Shortly before the Ramada, the Caliph had already established a chain of Government institutions known as the "Flour Houses" (Omar, 1996, pp 189 – 190). These grain depots were put to full use in the Year of Ramada in order to support the emergency bakeries that were set up. The Flour Houses were increased in number to be able to support the tens of thousands of people who flocked to the capital. The already established general kitchens (see above) were expanded in the stricken areas and cooks employed by the State prepared the food after sunrise for distribution (Sharqawi, 1988, pp 263).

4. Outreach:

The Caliph realized that there were people within the Peninsula who were struck by the famine but had no means to reach the capital city of Medina. The Caliph ordered his Minister of Communications Zeid ibn Thabit to prepare a document of all the places that were hit by the famine (Alnumani, 1998, pp 374). Historians report that orders were issued for food to be

taken to these remote geographical areas using State funds, and to distribute the food aid amongst the people who were unable to travel to the capital (Tantawi and Tantawi, 1983, pp 110). The food aid came in packages with the stamp of the Caliph on the package (Al-Numani, 1998, pp 375). The humanitarian situation in these far off areas was assessed by the Caliph's officials, and monthly aid was dispatched by the Government accordingly. Historians report that people received the food aid in these areas in their homes (Salabi, 2005a, pp 225).

5. Care of the sick:

The caliphate also took responsibility over the daily care of the sick in their homes in that period. It is further recorded that even when deaths occurred, the Government provided burial clothes required for the dead (Tantawi and Tantawi, 1983, pp 12; Salabi, 2005a, pp 225).

6. Multinational Aid:

As the famine grew worse, the Caliph decided to further deploy the whole of the Caliphate's resources into action. Orders were conveyed to the Governors of Egypt, Syria and Iraq to send immediate food aid and clothes to the Peninsula. The Governor of Egypt (Amr Ibn-Al-As) communicated a message to the Caliph informing him of the forthcoming food aid by land (Tantawi and Tantawi, 1983, pp 115; Salabi, 2005a, pp 226). As previously mentioned the Caliph had ordered that a waterway be created between the River Nile and the Red sea. Upon completion, the channel was used to convey aid to the Peninsula. Egypt sent 1000 camel loads of flour, 20 ships laden with food and 5000 robes. The Caliph received the 20 shiploads personally on the Arabian coast of the Red Sea (Al-Numani, 1998, pp 374). The Governor of Sham (Syria, Palestine and Jordan), Abu Ubaidah ibn Al Jarrah, arrived with 4000 camel loads of food (Ibn-Katheer, 2004, Vol 7, pp 234). Again Salabi has cited the scholar Sharqawi in reporting that the Governor of Damascus, Muawiyah Ibn-Abu Sufyan, sent 3000 camel loads of food whilst 1000 camels laden with flour arrived from Iraq

(Sharqawi, 1988, pp 262; Salabi, 2005a, pp 226). The Caliph and his officials distributed the food aid to those who arrived at Medina and sent aid to other areas of the Peninsula.

7. Personal Example:

The Caliph struck a personal example in the management of this crisis. The Caliph took an oath that he would not touch meat or butter during this period. He made a famous statement known to ancient Muslim historians:

"How could the sufferings of the people trouble me if I am not afflicted in the same way they have been afflicted"(Al-Tabari, 2005, Vol 2, pp 508).

This is rare amongst powerful rulers of the time especially when it is considered that this Caliph had by this time conquered the Persian Empire and the Middle Eastern portion of the Byzantine Empire.

c. Aftermath:

During the nine months of the famine, the Caliph, his governors and his officials worked on daily basis rendering food, clothes and supplies to the affected areas. Even remote areas were covered by this efficient state response. (Salabi, 2005a, pp 227). Towards the end, with the relief operations still going on, the Caliph ordered a general prayer to be held in Medina to be led by the Prophet's Uncle Abbas to invoke God to send the rains (Salabi, 2005a, pp 227).

As the rains came back, the tens of thousands that had been encamped outside the Capital started returning to their homes. The Government released provisions to sustain them until they regained their livelihood. Those who had no camels or horses to take them back to their homes were provided with camels from the State treasury. The sick were given special care with officials helping them till they reached their homes (Tantawi and Tantawi, 1983, pp 12). Citing the modern scholar Al-Emad in his review of the lives of the first two Caliphs, Salabi

reports that the Caliph Omar ordered that no taxes should be paid during that year (Al-Emad, 1997, pp 394; Salabi, 2005a, pp 230).

4.3.5iii Modern analysis of the State Response to the Famine:

Disasters whether natural or man-made usually have four phases (Howarth et al., 1997, pp 14 - 17). The acute phase is the disaster itself. The second phase is the immediate post disaster phase in which the casualty rate plateaus. The third phase is an intermediate phase which may be accompanied by epidemics. The fourth phase is the late phase and it is a phase of reconstruction. In this situation, we find the Caliphate responding as best as it could to each of these phases. In the acute phase, as populations trooped to the capital, the Government set up the camps and expanded its food aid. In the second phase, a consolidation process with careful assessment of the conditions of the affected areas was undertaken. The third phase occurred as the famine continued with the Caliphate triggering a multinational aid programme and the use of land and sea to expedite the arrival of relief. Finally the fourth phase was managed by officials caring for the refugees until they returned to their homes and continuing to provide aid until livelihood returned. Thus the humanitarian crisis was met with swift and efficient government measures and with government funding.

In modern times, similar health crisis and famine have occurred in the Arab world. Yet with all the technology available, the state response was always inadequate. Sudan is the largest country in Africa and is an Arab country. The nation has had several strings of famine in the past decades. The famines of 1984, 1988 and 1998 were serious disasters that hit the nation. These famines were caused by military conflicts as well as shortage of rains. In 1998 over seventy thousand people died from lack of food. There was severe malnutrition (Creusaux et al., 1999, pp 832). The Sudanese Government response to the disaster was slow and inadequate. Human rights organisations criticized the government for its response

(Human-Rights-Watch, 1999). Neighbouring Arab governments did little to alleviate the suffering of the civilian population. This is clearly in sharp contrast to the State response 14 centuries ago.

Interestingly, in the last decade of the 20th century, 75,250 people per annum across the world died as a result of disasters and about 210 million were affected by disasters (El-Ansari & Deeny in Wilson and Mabhala, 2009, pp 175). In many cases, humanitarian organisations distributed aid to refugee camps. It should be noted that the Caliphate's response to the famine was not restricted to the refugee shelters in Medina but included all the affected parts of the Peninsula with food reaching the vulnerable in their homes.

4.3.5iv The Plague of Emmaus:

Towards the end of 639CE, again during the reign of Omar ibn Al Khattab, an epidemic of plague spread through the region of Sham (Salabi, 2005a, pp 230). The Caliphate had just recovered from a severe famine that struck the Arabian Peninsula. Soon after the famine, the plague struck Sham north of the Peninsula. Historians narrate that the plague originally started in the small city of Emmaus between present day Jerusalem and Ramla in Palestine (Salabi, 2005a, pp 230). Emmaus lies about 7 miles northwest of present day Jerusalem. Within a short time, the plague spread through the whole region. It is unclear what the causative organism was. Historians report that the symptoms start with a reddened swelling. The site becomes swollen with hemorrhaging followed by gangrene resulting in death of the patient (Salabi, 2005a, pp 230). This epidemic is considered as part of a chain of epidemics that occurred in the 6th, 7th and 8th centuries starting in the 6th century with the plague of Justinian (Moorhead, 1994, pp 100- 110). The symptoms seem to be quite similar to bubonic plague. Bubonic plague is caused by a bacterium known as *Yersinia pestis*. This bacterium is classified by microbiologists as a gram negative coccobacillus that grows as a facultative

anaerobe. Rodents are natural hosts to this organism with the black rat *Rattus rattus* being the predominant rodent. Transmission is via fleas (*Xenopsylla cheopis)*. When an infected flea bites a human, it regurgitates the organism into the wound. The organism spreads via the lymphatics and causes intense haemorrhagic inflammation in the lymph nodes (Perry & Fetherston, 1997, pp 35 - 66). If the organisms reach the blood stream, haemorrhagic and necrotic lesions may occur in all organs. Without adequate treatment, death usually occurs. Bubonic plague has been responsible for over 200 million deaths world-wide (even though this figure has been disputed) and is regarded as the cause of the Black Death that swept Europe in the Middle Ages (Perry & Fetherston, 1997, pp 35 - 66).

The plague appeared in Sham after ferocious battles between the Muslims and the Romans which resulted in huge casualties. The decaying bodies of the fallen could have served as a rich medium for the spread of this organism (Al-Najjar, 1986, pp 224; Salabi, 2005a, pp 231). This thesis does not deal with the cause, but looks at a welfare state's response to an epidemic.

a. State Response:

The provincial governor of Sham, Abu Ubaidah ibn Jarrah, a distinguished companion of the Prophet Muhammad wrote to the Caliph Omar describing the outbreak of the disease. The Caliph decided to travel with top ministers to Sham to assess the situation personally. The Caliph got to the border of Sham and the Arabian Peninsula and was met by the provincial governor. Abu Ubaidah informed him that the outbreak had now reached epidemic proportions and that the whole Sham was now affected (Salabi, 2005a, pp 231). The Caliph and his ministers debated the next step. Most of the companions advised that the Caliph should return back to Medina. The governor objected to that decision and rebuked the Caliph for attempting to run from the Will of God (Al-Numani, 1998, pp 159 - 160). It was at this

point that a senior companion of the Prophet Muhammad Abdelrahman Ibn-Auf who was absent from the initial deliberations arrived at the border. He ended the dispute by citing the Prophet Muhammad who said:

"If you hear about it (the plague) in a land that you are in, do not run away from it, and if you hear that it broke out in a certain land, do not enter that land" (Al-Bukhari & Muslim in Ibn-Qayyim, 2003, pp 54).

The matter was settled. The Caliph returned to Medina and Sham was quarantined. The Caliph at one point tried to get his governor out of Sham but Abu Ubaidah politely refused (Salabi, 2005a, pp 231; Al-Numani, 1998, pp 160). The quarantine was thus enforced on every one including the highest ranking official of the region. The Caliph however agreed with orders to disperse people to higher grounds rather than valleys (Salabi, 2005a, pp 231). The order was put into effect.

b. Death of the Governors:

Abu Ubaidah received an injury in his foot. Within days he was infected and unfortunately died (Dahabi, n.d, pp 174). His death caused immense grief in the Caliphate. His position was immediately filled by his deputy Muadh ibn Jabal, another senior companion (Salabi, 2005a, pp 233). However within days Muadh lost his son by name of Abdelrahman (Al-Tabari, 1987, Vol 5, pp 36) to the plague and within days of his son's death, he himself got infected and died. At this time, Muadh had no designated deputy. Command of the region fell on another companion by name of Amr ibn al As who was the highest ranking official in the region after the death of the 2 governors (Salabi, 2005a, pp 231).

Amr took quick actions. As the death toll rose within the Muslim armed garrisons, Amr feared the loss of the entire army. With the Romans poised at the borders of Sham, Amr made the survival of the army a top priority. As Sham was quarantined by Islamic Law, he could

not take the army out of the region. He however moved the army to the mountains in much higher planes than the plague areas (Al-Tabari, 1987, Vol 5, pp 36; Ibn-Katheer, 2004, Vol 7. pp 95). The Caliph was informed of this move and made no objections. The plague raged on for a few months and slowly died down. Historians gave the number of casualties amongst the Muslims alone at 20,000 deaths (Salabi, 2005a, pp 235). We do not have the exact numbers amongst the entire civilian population but historians have reported that thousands of orphans and widows were in Sham after the plague.

c. Post Plague:

As the news reached Medina of the end of the plague, the quarantine was lifted. The Caliph made his preparations to enter Sham. Already state governors within the region were sending messages directly to Medina asking for aid and advice on the inheritors of the dead (Salabi, 2005a, pp 234). The Caliph reached Sham and toured the territories with his ministers and state governors (Al-Numani, 1998, pp 161). He undertook the following steps

1. Assessment:

The Caliph took a census of all those affected. He appointed officials to cater for the immediate needs of the affected population (Salabi, 2005a, pp 235).

2. **Aid:**

The State took over the care of those left behind by the deaths of their guardians. Salaries were given to widows, children and the weak from the state treasury. Those whose livelihood was destroyed by the epidemic came under the protection of the State and the Caliph ordered the rehabilitation of all those affected (Ibn-Katheer, 2004, Vol 7, pp 79; Salabi, 2005a, pp 235).

3. **Inheritance issues:**

The inheritance was distributed amongst the relatives of the deceased according to Islamic law with women and children having their share (Salabi, 2005a, pp 235; Al-Najjar, 1986, pp 325).

4. Reconstruction of the Province:

The Caliph revived the construction of the province that had halted during the epidemic. Major repairs were undertaken throughout the province (Ibn-Katheer, 2004, Vol 7, pp 79; Salabi, 2005a, pp 235).

5. Appointment of Governors and leaders:

The Caliph appointed two governors for the province. Coastal areas were given to Abdullah ibn Qais and Damascus went to Muawiyah Ibn-Abu Sufyan (later to become Caliph himself). The Caliph appointed several officials to look after the needs of the people. The army was rehabilitated and new commanders were appointed (Salabi, 2005a, pp 235; Al-Najjar, 1986, pp 325).

As the Caliph prepared to leave the region he summed his work in a few words to the people:

> "I have fulfilled my obligation towards you. We have improved your living and your dwellings. We have improved your sustenance and rehabilitated your security….. we have granted you your salaries …. if any of you has knowledge of something that we ought to have done and have not done then he should say it now and we will do it by God's Will" (Ibn-Katheer, 2004, Vol 7, pp 79).

The people replied that they were satisfied with the Caliph's actions and he departed the region.

4.3.5v Medieval comparisons and modern perspectives into the State's response to the Plague:

As stated in the historical section, the Plague of Emmaus was most likely bubonic plague caused by *Yersinia pestis*, which now has antibiotic treatment. However, the Caliphate's response illustrates a system of infection control and disaster management. When compared to several outbreaks of plague in medieval times, the Caliphate's reaction appears unique. One of the worst plagues that ever happened in medieval history was the Black Death that hit Europe between 1348 and 1350. As millions died, the economy suffered. The consequence was that diets became limited and Europeans suffered more health problems with more than half of the continent dead according to scholars (Benedictow, 2005, pp 42). As the situation worsened, European governments were at a loss on what to do. People turned their anger on religious minorities. The cause of the plague was wrongly attributed to Jews poisoning the water wells (Bennett and Hollister, 2006).

Campaigns against the Jews began. In August of 1349, the Jewish communities of Mainz and Cologne were destroyed. In Strasbourg, 2000 Jews were killed (Jewish-Encyclopaedia, 2002 - 2011). By 1351, 60 major and 150 smaller Jewish communities had been destroyed (Wein, n.d). No religious minorities were targeted in the Plague of Emmaus. Aid reached both Muslims and non-Muslims alike. It is interesting that none of the European Governments in the medieval period used quarantine. The strict quarantine enforced by the Caliphate and supported by the high moral values of the provincial governors played an important role in preventing spread of the disease outside Sham. Quarantine is still used today in preventing the spread of infectious diseases. Another interesting point is the instruction of the Caliph to take the people to higher planes which was followed by moving the army to the mountains. These steps were taken as measures to contain the disease. Medieval Muslim historians have thought that these instructions had an effect due to the

purity of the air in higher planes. However, from what we now know of the transmission of *Yersinia pestis,* an alternative explanation for the efficacy of this measure is provided here for the first time.

The natural host of the organism is the Black Rat (*Rattus rattus*). Transmission is through the bite of the flea *Xenopsylla cheopis* (Sanchez and Gomez, 2012, pp 423 - 426). This flea is wingless. Though it can jump to almost 200 times its own length, it clearly will not be able to get to much higher grounds. Thus higher grounds would be free of the transmitting agent and probably the natural host as well. By moving the population and the army to higher grounds, the transmission cycle of *Yersinia pestis* would have been interrupted thus preventing further spread of the deadly organism. This explanation is far more plausible than that given by Muslim medieval scholars. This explanation is based on modern scientific data of the organism and disagrees in entirety with the explanation of the medieval writers that it had to do with the purity of the air in the mountain areas. Bubonic plague caused by *Yersinia pestis* is not transmitted by air droplets.

The break in the transmission cycle added to the strict quarantine measures placed by the State would explain the relatively much smaller deaths in the Caliphate when compared with the mortality in Europe centuries later. Perhaps the most effective measure was the quarantine. Indeed one may be able to judge roughly the effectiveness of the quarantine using the historical data. With 2 governors in quick succession dying, the population had a personal example in the deaths of these leaders that the quarantine was for everyone and no one was above the law. Indeed even the army could not be moved out of the region. The transparency through which the quarantine was enforced on the area would have been instrumental in its efficacy. The relatively low deaths again would support the argument that the quarantine was to a certain level effective.

In modern times, the World Health Organization has laid down guidelines to contain epidemics. The International Health Regulations (2005) or "IHR (2005)" have been in force since 15 June 2007 (WHO, 2008). The purpose and scope of the IHR (2005) are:

"to prevent, protect against, control and provide a public health response to the international spread of disease in ways that are commensurate with and restricted to public health risks, and which avoid unnecessary interference with international traffic and trade" (WHO, 2008).

The IHR (2005) provide a framework for WHO epidemic alert and rapid response activities already being implemented in collaboration with countries to control international outbreaks and to strengthen international public health security.

The IHR (2005) introduce new operational concepts including (WHO, 2008):

a. Specific procedures for disease surveillance, notification and reporting of public health events and risks to WHO by countries
b. Requests by WHO for verification of public health events occurring within countries
c. Rapid collaborative risk assessment with and assistance to countries
d. Determinations as to whether an event constitutes a public health emergency of international concern
e. Coordination of international response

Recently the WHO has published more operational directives. One of these was "a rapid, transparent decision mechanism" (Giesecke, 2014). The issue of transparency has already been discussed above. The Caliphate did respond to the Plague of Emmaus in an almost similar manner to the above considering the limited technology available in the 7th century. The central government was notified immediately of the outbreak and its events. Risk assessment resulted in complete quarantine of the whole region. Post disaster, a co-ordinated

state response was put into effect with aid going to the affected population. In recent times several outbreaks of epidemics have occurred in Muslim countries. War torn countries like Sudan, Afghanistan, Somalia and more recently Iraq and Gaza have all witnessed outbreaks of epidemics. In most cases, these countries have depended heavily on international aid from Western nations and non-governmental organizations including the Red Cross. The WHO supplies technical aid and assessment tools in almost all instances (Giesecke, 2014). None of these countries have a well-developed state response system to outbreaks and diseases spread rapidly often with high mortality. The basic principle of public health care and disaster management seems to be almost non-existent in present day Muslim countries despite reaching a relatively sophisticated level over a millennium ago.

4.3.6 Death of the Caliph:

Unfortunately in the 10th year of his rule in the year 644CE, Omar was assassinated by a Persian servant in Medina called Abu Lu'loa al Majusi. The servant had come to Omar to complain about his master claiming that his master was taking from his trade (Abu Lu'loa al Majusi) more than is necessary. Omar looked into the matter personally and decided that his master was fair (Al-Numani, 1998, pp 195).

During the dawn prayers at the Prophet's mosque in Medina where the Caliph Omar personally led the prayers, Al Majusi moved unnoticed to the front row of worshippers. As the prayers started and due to the darkness still prevalent within the mosque, Al Majusi attacked the Caliph with a dagger as he led the prayers. With several stab wounds, the Caliph collapsed. The worshipers realised that Omar had collapsed and the prayers came to an end. In the scuffle that followed al Majusi was killed and according to some sources he killed himself (Salabi, 2005a, pp 516). The Caliph was moved quickly to the inner quarters. He was fatally wounded and died two days later from his injuries. There was great mourning within

the Islamic State. Omar had ruled with justice and was greatly loved and admired by the people for his sense of justice coupled with his austere living.

Before he died, he created a committee of six elite Companions. He asked them to choose one of themselves to become the next Caliph (Salabi, 2005a, pp 520). After short deliberations with candidates giving up their positions to others, the final choice of Uthman ibn Afan as Caliph was made. He was one of the elite companions of the Prophet and one of the richest. He was also the Prophet's son – in – law.

In 10 years, Omar and his fellow companions had succeeded in annexing the whole of the Persian Empire and most of the Middle East. The Byzantine Empire had been weakened especially after the loss of Palestine and Egypt. He had succeeded in applying the principles and concepts of social welfare that directly influence health. With the foundations of the large State now in place, the next Caliph, Uthman, an economic expert would take over the management of the vast Caliphate of Islam with all its financial and human resources. The next chapter looks at this particular era of Islamic History and the effect of his economic expertise on the social welfare of the citizens.

Table 7: Summary of Initiatives in the time of Omar

Initiative	**Actions**
Welfare state	Continuation of the welfare initiatives of the Prophet and Abu Bakr
	Benefits to non-Muslims
	Benefits to the disabled
	Unemployment benefits
	Benefits to the poor and needy
	Benefits to abandoned children
	Benefits to orphans
Welfare of women	Care for widows
	Care for aged women
	Care of women whose husbands were away
	Benefits to women
Child Care	State Stipends to children from date of Birth
Education	Department of Education set up
	Teaching the Arabic Language
	Teaching the Qur'an and the Traditions of the Prophet
	Preservation of centres of learning in conquered territories
Travelling Practices	Care of the Traveller
	Special camels on highways
	Road constructions
	Flour Houses
The Pilgrims Route Programme	Rest houses refurbished
	Construction of wells
	Purification of wells
General kitchens in cities	Providing cooked food for the needy
	Providing cooked food for travellers
Water supply	Waterways of Egypt and Iraq
	Fresh water to cities
Housing Legislation	Home security
	Home ownership regulations
Food production	Agricultural reforms
	Transformation of barren lands
Natural disaster management	The Famine of Arabia
	The Plague of Emmaus

Chapter 4

Section 4: The Era of Uthman Ibn-Affan

In this chapter, the following topics will be covered:

1. The personality of the third Caliph will be presented
2. His economic reforms will be discussed
3. The affluence of the State in his era will be highlighted
4. The welfare policies will be identified and analysed
5. The assassination of the Caliph and an introduction to the first civil war of Islam

4.4.1 Uthman Ibn-Affan as Caliph (644CE - 656CE):

Uthman was another senior companion of the Prophet Muhammad and was also his son- in-law. He was one of the early companions of the Prophet who believed in him in the years of persecution. Uthman was a successful businessman prior to and after his conversion to Islam. A wealthy and generous companion, Uthman spent a lot of his wealth for the sake of the religion during the early years of Islam and the young Islamic State in Medina. His wife was the Prophet's daughter and when she died the Prophet gave him another of his daughters. He was thus the only man to marry two daughters of the Prophet Muhammad thus signifying how dearly the Prophet held him (Salabi, 2002, pp 14).

4.4.2 Leadership style and the welfare system:

In his first speech as Caliph, Uthman declared that he would continue the policies of his predecessors. The State will continue to be ruled according to the Book of God and the Traditions of the Prophet. He declared that the position of the welfare state would continue (Salabi, 2002, pp 79; Al-Tabari, 1987, Vol 5, pp 443). In his first letters to the governors he warned them not to be malicious but to meticulously look after the welfare of all the Muslims and the non-Muslims (Al-Tabari, 1987, Vol 5, pp 244; Salabi, 2002, pp 80). We have the script of his first letter to provincial governors and it reads:

"God has ordered the leaders to be caring shepherds and forbade them from being oppressive tax collectors and if the people follow God's injunctions, they will always create caring shepherds and never create unjust oppressive tax collectors. And if leaders are on the verge of becoming oppressors and continue in that direction, then self – respect, honesty and loyalty will disappear. The best way is to look into the affairs of the Muslims – take from them what is just and give them their due. Be gentle to the non-Muslims – give them their due and take from them what is just" (Al-Tabari, 1987, Vol 5, pp 244; Salabi, 2002, pp 80)

To the collectors of land tax, the Caliph issued this letter:

"God created in Truth, and He does not accept except what is true and just. Take what is right and just and give what is right and just. Beware – Honesty and I repeat – Honesty – work with it and do not be the first to abandon it. Integrity! Integrity! Do not be unjust to the orphan or to he who is on a covenant with us or God will take revenge on their behalf" (Salabi, 2002, pp 82; Al-Tabari, 1987, Vol 5, pp 244).

These letters emphasised the role of the State as a welfare state.

4.4.3 Economic advancements:

Uthman greatly advanced the economy of the caliphate. The following principles of Islam were enforced (Salabi, 2002, pp 109; Ibrahim, 1986, pp 61):

1. The application of Islamic general Economic principles
2. Just taxation
3. The Muslims are to pay into the state welfare treasury according to their means
4. The Muslims are to take their due rights from the State Treasury
5. The non-Muslims are to pay their due into the State treasury according to their means and take their rights from it as well and they should not be oppressed.

6. Tax collectors are to be specially picked. They are to be honest people with high standards of values.
7. Any form of economic invention that will adversely affect the steady increase in the welfare system and the prosperity of the general public should be ignored.

Further organisation into the economic system by Uthman involved selecting a particular month in the year for collecting taxes. This month was the first month of the Muslim calendar (known as the month of Muharram) (Salabi, 2002, pp 116). Uthman like his two predecessors instructed that the taxes collected in Muharram should be on the wealth of the individual after his debts have been paid and not before. He further emphasised as a principle of the welfare system that individuals with debts need to settle their debts first and the taxes are then placed on the remainder (Salabi, 2002, pp 116).

4.4.4 Social welfare policies:

4.4.4i Increase in the Efficiency of the State Benefits System:

Uthman was keen to ensure that all State benefits were to be paid on time without any delay. He made sure that complicated bureaucracy should not get in the way of State benefits being paid or indeed government salaries or government projects in the public sector from being delivered on time (Salabi, 2002, pp 113; Ibrahim, 1986, pp 66).

4.4.4ii Increasing food supplies during the month of Ramadan and travelling practices:

The Muslim month of Ramadan is a month of fasting. It was the tradition of the Prophet that Muslims could spend most of the nights in the mosques - a process called Itikaf. Uthman ordered that food supplies be placed in the mosques during the month of Ramadan to cater for the Muslims undertaking Itikaf. Further food supplies were placed in mosques for travellers and poor people during the month of Ramadan (Salabi, 2002, pp 118; Al-Tabari, 1987, Vol 5, pp 245).

Uthman further developed the care of travellers that was instated by Omar. As previously stated, Omar had placed several Houses of Flour along highways to cater for the travellers. Uthman developed accommodation buildings for travellers. These buildings were placed in several cities for travellers passing through these cities who had no relatives to stay with. They were fully sponsored by the State (Al-Tabari, 1987, Vol 5, pp 273; Salabi, 2002, pp 119). Furthermore there was state spending on pilgrims to the holy house of Mecca during the pilgrimage period.

Uthman also built the first naval ships of the Caliphate from the State treasury (Salabi, 2002). This was under the advice of his Governor of Damascus, Muawiyah. This Governor had initially advised the Caliph Omar on the same venture. Omar had turned the request down on the basis that the Arabs could not swim and may not be able to undertake naval warfare (Salabi, 2002, pp 132; Ibrahim, 1986, pp 147 - 148). However, with the expansion of the Caliphate in Uthman's era, he found it necessary to have a naval force in the Mediterranean to fight off the Byzantine navy.

4.4.4iii Increasing benefits/pensions spending:

Uthman increased the pensions of citizens in the state as the State got richer. He also increased the salaries of workers and the benefits to the less privileged. It has been reported that in his time, a contemporary of his Al Hassan said:

> "I witnessed the messenger of Uthman calling out to the people: 'O people, go and collect your share of clothes', so they went and collected their dressings, and 'go get your shares of butter and honey'. There was great abundance" (Salabi, 2002, pp 134).

This is an interesting piece of evidence as it quotes a citizen's perception of the economy of the State and its reflection on the daily lives of the population. Here the citizen talks about "great abundance" and it does appear to reflect that the economic growth of the State reflected directly on the ordinary people.

Uthman increased the child care stipend when the child got to a year of age (Salabi, 2002, pp 134). This again is another indication of the growing affluence of the Islamic State. Uthman also initiated the concept of inheriting pensions. For instance when soldiers died, he instructed that their salaries and pensions be passed onto their wives and children (Salabi, 2002, pp 135).

4.4.4iv Food and Home security and expansion of water wells:

Food security was a major duty that the Righteous Four took upon themselves. The modern historian Salabi who has provided a summary of the major medieval chroniclers has provided evidence from several historians that Uthman took this quite seriously and included home security as well with governors distributing homes in their different states (Salabi, 2002, pp 262).

This State distribution of homes to the poor involved building "State homes" that housed the less privileged all paid for by the State. In the modern UK, these would be analogous to the Council houses.

State treasury also increased the number of water wells in the state (Salabi, 2002, pp 132; Ibn-Katheer, 2004, Vol 7, pp 161; Al-Tabari, 1987, Vol 5, pp 284).

4.4.5 Nation building and general expansion:

The nation building process continued in the time of Uthman. As more regions were annexed to the Caliphate, the administrative processes and the welfare system expanded to the new regions. Taxes brought in from the new administrative areas also added to the State treasury.

Uthman continued the construction works of Omar. Again several water channels were built in Iraq under his governor Abdullah ibn Amer (Salabi, 2002, pp 263).

As the economy grew in the time of Uthman, further expansion of the agricultural, manufacturing and trade sectors continued. The capital city of Medina in the Arabian

peninsula like other cities in the Caliphate saw a great pace in development (Salabi, 2002, pp 135). As more cities were added to the Caliphate's boundaries through further conquests, the caliphate brought together several cultures under one government. The Caliphate utilised the talents and knowledge of the several populations now under its rule. The multicultural society increased the social development of the State (Salabi, 2002, pp 135).

4.4.6 Death of Uthman:

Towards the last six years of the Caliph's rule, discontent started to rise in some sectors of the Islamic State. Some of his companions had complained that the increased affluence of the population may result in rebellion against the Caliph but the Caliph had refused to cut down the economic spending. His mild character and his great patience towards opposition only served to create more rebellion towards his rule (Salabi, 2002, pp 392).

After a complicated series of events that are beyond this thesis, the Caliph was assassinated in his own home after he forbade that his companions take arms against a group of dissidents to prevent bloodshed in the city (Salabi, 2002, pp 392). He was eighty two years of age (Salabi, 2002, pp 399; Al-Tabari, 1987, Vol 5; pp 438).

The companions in Medina flocked around another senior companion of the Prophet Muhammad and his cousin. His name was Ali ibn Abi Talib and he became the Fourth Righteous Caliph and the last in that era.

Uthman had built on the foundations built by his predecessors. His economic advancements had greatly raised the standards of living of the citizens. His death caused a split within the vast nation that would lead to civil war that left its marks and scars long after him. His successor took over a prosperous but internally divided state.

Table 8: Summary of Uthman's Era

Initiative	**Action**
Welfare State	Continuation of the practices of his predecessors
Economic expansion	Economic laws and legislation
Increased efficiency of the State benefits system	Benefits and salaries to be paid on time
Child Care	Increase in the child stipend
Food supply	Increased food supply especially in the month of Ramadan
Travelling Practices	Houses built in cities (in modern terms "Government owned Hotels")
Increases water supply	Increase in the number of wells
	Increase in the number of water channels
Food and home security	Increased agricultural production
	Home distribution to the needy
Benefits and pensions	Increase in the actual money paid out
	Pensions/Benefits to be inherited

Chapter 4

Section 5: The Era of Ali Ibn-Abi Talib

In this chapter, the following topics will be covered:

1. An introduction to the personality of the final Caliph of the era
2. His social welfare policies will be identified and analysed
3. The events that led to the first civil war in the Caliphate
4. The assassination of the Caliph and the beginning of a new era

4.5.1 Ali Ibn-Abi Talib as Caliph:

After the assassination of Uthman, the Caliphate went immediately to Ali ibn Abi Talib, a respected companion of the Prophet, his son in law and cousin. Ali was one of the earliest people to believe in the Prophet during the early years. He was 10 years old when he declared his belief in the Prophet (Jackson, 2006, pp 17). A trusted companion, the Prophet had left him behind in Mecca during the migration to Medina to return goods under the care of the Prophet back to their owners. He later joined the Prophet in Medina (Jackson, 2006, pp 17). It was in Medina that he married the Prophet's daughter Fatima (Jackson, 2006, pp 17).

After Uthman's death, the companions in Medina unanimously declared Ali Caliph. Unfortunately due to the enemies of Uthman controlling a lot of Medina, Ali could not bring them to justice immediately. This led to Muawiyah ibn Abi Sufyan, the Governor of Damascus to declare a non-allegiance state to Ali until the murderers were brought to justice. Muawiyah was the next of kin to Uthman. Ayesha, the Prophet's wife alongside several senior companions sided with Muawiyah. Ali's constant messages to the dissatisfied group that he was unable to bring immediate justice to the murderers failed to bring them to pay allegiance to him (Bewley, 2002, pp 18 - 19).

Unfortunately after a complicated series of events which are beyond this thesis, civil war broke out between Muawiyah and Ali. This war lasted for the full 5 years of Ali's rule. By 661CE, a group of men calling themselves the Khawarij decided to assassinate both

Muawiyah and Ali (Bewley, 2002, pp 28). They succeeded in killing the Caliph but the Governor survived the attempt. The Muslims rallied around Ali's first son Hassan.

Hassan decided to bring the civil war to an end putting the Caliphate's interests above his personal ones and he declared a truce with Muawaiyah. It has to be noted that Hassan was the first grandson of the Prophet Muhammad through the Prophet's daughter Fatima.

Hassan handed the Caliphate to Muawiyah and the latter became the undisputed Caliph of the Muslims and once again the Caliphate came under one government (Kennedy, 2004, pp 80 – 81). Muawiyah's rule ushered in the Ummayad dynasty.

4.5.2 Ali's rule:

Ali continued the welfare system of his three predecessors. All institutions set up by his predecessors were maintained. Ali re-organised the state benefits system to make sure that all people be paid the same amount of benefits. It is recorded that he even gave those that opposed his rule the same state benefits as those who were on his side (Salabi, 2004, pp 271; Al-Samad, 1994, pp 216).

Again under his direct supervision, he made sure that both Arabs and foreigners under his rule were given equal state benefits (Salabi, 2004, pp 271).

He like his predecessors commanded governors under his rule to distribute the national wealth justly on the state employees and the needy (Salabi, 2004, pp 436). Ali was also keen to keep food prices under control.

He had in place secret inspectors that would go into the different provinces to ask people about their governors and whether the governors treated the people justly. Governors had no idea of these inspectors and so the Caliph guaranteed that he had genuine information about the welfare of the people of the provinces (Salabi, 2004, pp 428).

It should be noted that the chroniclers do affirm that the welfare state and the policies of the first three Caliphs were in place in the areas under the control of Muawiyah ibn Abi Sufyan in Sham during the civil war as will be seen in the section of the Ummayad Caliphate.

Unfortunately Ali was assassinated in 661CE by the Khawarij. Despite Ali's just rule, his 5 year tenure was clouded with the civil war in his attempt to re-unite the vast lands of the Caliphate.

That ended the era of the Righteous Four.

Table 9: Summary of Ali's Era

Initiative	**Action**
Welfare state system	Continuation of the system of his predecessors
	All institutions remained in place during the civil war
Benefits system	Equality of pay
	Opposition groups received their benefits during the war
Grass root monitoring of the welfare state	Secret spies sent to provinces to get first-hand information on the welfare of the people

Chapter 4

Section 6: Specific analysis of the era of the Prophet and the Righteous Four.

In this chapter, the following topics will be covered:

1. Analysis of all nine social determinants of health as defined by the Ottawa Charter of the WHO in light of the historical data in the eras so far discussed.
2. An attempt at identifying the life expectancy of the Companions of the Prophet.

4.6.1 Determinants of Public Health:

In contemporary public health practice, several determinants of health care have been formulated and modified in the last few decades. The World Health Organisation defines health as a 'state of complete physical, social and mental health and not merely the absence of disease or infirmity' (WHO, 2003a). By the turn of the 20th century, more attention was given to the biology and treatment of diseases. However, by the 1970s, it was clear that health status was not just affected by biology and health care services but also affected by life style behaviours and the environment (Lalonde, 1974, pp 260 - 268). This led to the WHO Ottawa Charter for Health Promotion (WHO, 2014c). This set out 9 pre-requisites for good health which have been discussed previously in the Introduction.

In the 1990s, the salutogenic theory was proposed by Antonovsky to challenge the current biomedical concept of health (Antonovsky, 1996, pp 11 - 18). This theory was really a follow up to the Ottawa Charter and it looked at what maintains health and enforced the importance of the social determinants of health. These principles still do not attract investment in modern day government policies as most investment in health re-enforces the biomedical world view.

More research has shown further the cardinal importance of social determinants of health. The rainbow model of Dahlgren and Whitehead (Jinks et al., 2010, pp 1 - 9) provides an overall guide to the principles that affect health. The first and smallest level in this model is given to the biomedical factors of disease (which unfortunately remain the most expensive

aspects of health care). The rest of the levels incorporate the social determinants of health and the health care policies that influence them (Fig 6).

Figure 6: The Rainbow Model (Source: http://www.publichealth.ie/blog/2011-10-04/public-health-across-life-course-time-

time-renew-debate: Accessed 20/08/2014)

Social and societal factors influence the interplay between the social determinants and population health. Furthermore, health promotion experts have continued to move more "upstream" to look for the societal causes that influence the social aspects of disease that in themselves affect the biomedical onset of illness (Graham, 2009, pp 463 - 479). Still, the above principles of the social determinants of the health remain the gold standard set by the WHO. The next section will examine some of these principles in the light of the historical data presented in the previous section. It should be noted that the WHO pre-requisites are applicable at any era in history as health determinants. Indeed in many developed countries, life expectancy has been shown to improve more so due to improved socio-economic conditions than the improvements in biomedical care (Link and Phelan, 2002, pp 730 - 732).

4.6.2 Peace:

The era of the Prophet and the Righteous Four had several armed conflicts. However with the Peninsula coming under one unified central rule, these battles were confined to frontiers in most situations. Even when new territories were added to the Caliphate, stability was quickly brought into the cities by covenants and treaties with the conquered peoples. We saw in the historical data, that security for the civilian populations was always granted by the conquering Muslim forces.

The historical data shows a strong sense of security within the boundaries of the State. This is exemplified in the investment by the State in travelling practices that we saw throughout the era described. Indeed, the advancement of these investments in the time of Uthman showed that the areas were secure and safe enough to permit further government investment. When civil war erupted in the time of the Fourth Caliph, the institutions of the Caliphate remained in order as the 2 men were in themselves religious companions of the Prophet. There is no record of any State institution being destroyed by the armies of either man. Again the fighting was confined to the frontiers. It is thus reasonable to assume that the

era of the Prophet and the Righteous Four created a reasonable level of internal peace and security within the boundaries of the Caliphate especially after the Peninsula came under a single central government.

Peace has direct impact on public health. A study of the impact of the January 2005 Peace agreement in Sudan showed that population access to salt increased in South Sudan and the consumption of iodised salt increased significantly (Gaffar and Mahfouz, 2011, pp 178 - 182). Many other modern day research works have shown a direct link between peace and public health (Laaser et al., 2002, pp 107 - 113). In research from the Johns Hopkins University in Baltimore, a direct link in deteriorating health conditions of the people of Palestine as a result of military operations was highlighted (Qato, 2004, pp 341 - 364). Whilst there are records of clear public health issues in the time of the Prophet as a result of conflict with the rest of Arabia (hunger for instance was well documented amongst the Prophet and his companions in the Battle of the Trench (Al-Mubarakpuri, 2002, pp 364), these issues do not appear in the historical data after re-unification of the Peninsula and the expansion of the caliphate. There are 2 possibilities for this. One is that they may have existed but not recorded. Considering the amount of records that are present and the chronicles of medieval historians that seem to have recorded events in detail including the famine of Arabia (for instance), this possibility seems unlikely. The second possibility is that as above, the internal security of the Peninsula post re-unification and the full implementation of the welfare state prevented war-induced hunger and poverty. Again considering the data available, it is my opinion that this is the more plausible argument.

4.6.3 Shelter:

The historical data presented in the previous section showed the Caliphate providing home security and legislation. Indeed, in the Caliphate of Uthman, as the economy prospered, homes were actually distributed by his governors to the needy. In modern times, WHO

research done in 2003, revealed a direct link between housing and public health. The authors concluded that the preliminary phase of the study would likely generate concrete recommendations with regards to housing, poverty and health (Bonnefoy et al., 2003, pp 1559 - 1563). In research focusing on a population of chronically homeless people with severe alcohol problems, a Housing First programme was associated with a relative reduction in Medicare costs after 6 months (Larimer et al., 2009, pp 1349 - 1357). Whilst 6 months is a short period to judge the effectiveness and efficiency of a public health intervention, it does show an almost immediate effect in the target population.

Recently in 2011, the WHO released another publication regarding the environmental burden of disease associated with inadequate housing. The report showed that that inadequate housing usually affects the less wealthy and disadvantaged and therefore was most often experienced by the most vulnerable population groups. The report showed that inadequate housing was directly and indirectly linked with negative health outcomes (Braubach et al., 2011,). The report almost echoes policies taken by the Righteous Caliphs almost 1400 years ago. When Omar vowed that he would not want the widows of Iraq (a vulnerable section of the population in his time) to need anyone after him, he ushered in a major shift of government policy towards welfare of the needy of the population.

Furthermore with legislation following the fires of Basra and Kufa, the issue of safe housing had reached the highest level of the Caliphate's Government. With Uthman distributing homes directly to the less wealthy and poor of his caliphate, the government of the time would have reduced the burden of disease associated with inadequate housing as suggested by modern day research methods.

4.6.4 Education:

We saw in the previous section, a special Department of Education being set up in all the provinces in the time of Omar. The historical data showed that these schools taught the

Arabic language to the new populations under their control. In addition, the schools taught the Qur'an and the traditions of the Prophet. These traditions included the health policies prescribed by the Prophet. Whilst these policies may have been taught to a non-Muslim population, the national policies would have been put into effect as a matter of law.

It is interesting that the historical data showed the setup of an efficient Department of Education in Greater Syria right from the outset. The initial school set up in Syria taught thousands of people (Salabi, 2005a, pp 188).

Omar's era saw a rise in literacy amongst the population of the Caliphate. He had wished to wipe out illiteracy in the land. Indeed he had special measures in place particularly for the nomadic Bedouin Arabs who wouldn't go to "school". The Caliph used to send inspectors into the desert to examine the Bedouin Arabs on literacy and punishments were meted to those who had refused to learn (Salabi, 2005a).

To understand the potential effects of education on health with special emphasis on literacy, a comparison could be made between the educational levels of developed and underdeveloped nations in the contemporary world. The following example looks at the UK – a developed country and Egypt – a developing nation.

Educational policy seems to be completely different in both nations. UK policy has ensured that well over 99% of the population are literate. On the other hand, the policy in Egypt has resulted in only 74% of the population to be literate as of 2012 (Bank, 2014). It is pertinent to mention though that even the UK appears to lag behind some of the European nations. About a fifth of adults in the UK appear to have the literacy of an 11 year old by European standards (NLT, 2014). The best education system in Europe appears to be in Finland with almost two thirds of students going on to college (Taylor, 2011). There is a wide gap in the health of the population in Egypt and that of the UK. That is not surprising looking at the education differences between the two nations.

Research has even showed that within the same nation, the level of education can affect health inequalities. Obesity for instance has been shown to affect low socio-economic groups in the UK which usually have less education (Howe et al., 2011, pp 144 - 153). Similarly in Egypt, stunted growth is common in children in areas with low literacy rate (WHO, 2013a). Household income is directly related to the level of education. Egypt is a low middle income nation and it ranks 112 from 186 nations on the Human Development Index (WHO, 2013b).

A critical analysis of the historical data searched did not yield any quantitative data on the literacy rate in the era of the Righteous Four. It does, however, show an emphasis on literacy by the Government. If the schools in Syria were the prototype of the rest of the schools, these institutions were free of charge and were able to absorb large numbers of students. Either way, these schools would have improved the health status of the population by increasing the literacy rate as demonstrated by modern day analysis.

The Pre-Islamic Arabs were mostly illiterate. Indeed the Prophet Muhammad himself was illiterate but the Qur'an put a lot of emphasis on education and knowledge whilst maintaining that the Prophet had to remain illiterate (Qur'an, 96 (1 – 5)).

So much emphasis was placed on the literacy of the early Muslims that the illiterate Prophet himself would declare after one of the major battles with the unbelievers – the Battle of Badr – that prisoners of war who were literate would be released if they taught ten children how to read and write (Al-Mubarakpuri, 2002, pp 276). A critical analysis of such a declaration would suggest that the Prophet was prepared to release enemy soldiers who were on the battle field for no other reason but to kill him and his companions provided they would teach the illiterate Muslims. Such an early emphasis on literacy by the young Islamic State would plausibly explain the massive expansion of the school system seen in Omar's era and his insistence on education with punishments meted out to those who would not "learn".

It is thus possible that the emphasis on education through State policy in the time of the Righteous Four would have contributed to an improvement of health status though this is not quantifiable.

4.6.5 Food:

The historical data show a clear and focused policy of the Righteous Four with regards to food security and agricultural production. Not only was the private sector encouraged to increase food production (as illustrated by Omar's legislation with regards to arid lands), but also the Caliphs' investments in Food Houses either in the form of general kitchens or highway bakeries. Food distribution as a function of the State was illustrated in the data during stable times and in the face of natural disasters. Food insecurity poses a significant public health problem. A recent review done by authors from the University of Pittsburgh showed that individuals experiencing food insecurity exhibited clinical signs such as poor health status, poor diabetes and chronic disease management and poor cognitive function (Kregg-Byers and Schlenk, 2010, pp 278 - 285). Researchers from Stanford in the USA, using data from the National Health and Nutrition Examination Survey found that food insecurity and poverty were predictive of nutritional outcomes in adults and the elderly (Bhattacharya et al., 2004, pp 839 - 862).

In recent times, a failure of policy to deal effectively with food security on the African continent has led to humanitarian crises in many parts of the continent, such as Somalia and Ethiopia. In 2008, the UN and UNICEF warned that the situation in Somalia was deteriorating and that many in East Africa faced starvation (Moszynski, 2008, pp 1211). The policies of the Righteous Four recognised the importance of food security 1400 years ago and the government had a robust and clear policy of providing food for its citizens. The Caliphate went to the extreme in providing food not only to the poor and the needy but even for travellers.

Whilst again we have no quantifiable data with regards to the nutritional level of citizens in the Caliphate or any data regarding nutrition within socio-economic stratifications, the policies discussed in the historical data do suggest that food supply was adequate. The statement provided by a citizen during Uthman's time regarding the "abundance" within the Islamic State does indicate albeit anecdotally that the citizenry did enjoy comfort to a certain extent. Later in this thesis, the economic status of the State will be discussed and the historical data with regards income/expenditure will be highlighted. Furthermore, during the famine in Omar's era, the swift arrival of aid to the stricken Peninsula following the orders for a multinational response and the amount of food delivered showed a State that clearly had storehouses of food ready to disperse at short notice.

4.6.6 Income:

The association of low income and poor public health outcomes is well documented in modern public health research. Increased income and reduction of poverty have direct implications on a wide range of public health outcomes. For instance a recent study analysed the temporal associations of socio-economic indices and improved neonatal, maternal and perinatal survival in the State of Qatar over a 35 year period. The authors concluded that the reduction in poverty and increased maternal education were temporally associated with improved survival of the study population (Rahman et al., 2010, pp 311 - 318). A direct relationship between low income and child health was illustrated in a Canadian study. The study pointed that children living in low-income neighbourhoods or families have worse health outcomes on average than other children on a number of key indicators, including infant mortality, low birth weight, asthma, overweight and obesity, injuries, mental health problems and lack of readiness to learn (Gupta et al., 2007, pp 667 - 672). In another study, low neighbourhood incomes and low maternal education were associated with elevated risks of preterm birth, small-for-gestational-age (SGA) birth, stillbirth and neonatal and post

neonatal death (Luo et al., 2006, pp 1415 - 1420). The historical data provided showed the Righteous Caliphs initiating policies to increase the income of the citizens.

Stipends for the poor, the needy, children and women all served to alleviate the suffering of poor income families. We have seen historical data showing the abundance in the time of Uthman indicating an increasingly affluent society with increased equity in wealth distribution as a principle of the welfare state. The expected outcome would be improved health status of the citizens as is understood by modern health research.

Average income in modern times has been the subject of modern day social policy formation. The definition of poverty has been a subject of debate. One of the definitions looked at relative poverty considered to be the lack of resources by individuals that would enable them to live according to the average acceptable conditions for their societies (Baldock et al., 2012, pp 87). However this definition does not provide an equitable distribution of income and services with regards to health. The average acceptable conditions for a health service within a developing nation may be far from acceptable in a developed nation thus widening the health inequalities gap. Income and social inequality are closely linked. Indeed income distribution remains the greatest index of inequality in the UK and in defining poverty, the country has placed an arbitrary less than 60% of median income as its definition (Baldock et al., 2012, pp 86). This however does not put into consideration relative household expenditures or needs of families who may be earning above the poverty line but in debt due to their high expenditure.

The Islamic system applied in the Caliphate did have a definition of poverty and there was a Government threshold in general and specific terms. In general terms, taxes were only applied to individuals on their monetary wealth if it exceeded a threshold known in Islam as the Nisab. This was equivalent to 20 dinars of gold with one dinar equal to 4.25 grams of gold. This monetary value has to be present with the individual for one year prior to taxation.

If at any time, the individual's wealth through a year goes below 20 dinars of gold, the wealth is not taxed irrespective of the total income of the year (Hasan-uz-Zaman, 1991, pp 65). Below the Nisab, citizens could actually apply for State support if needed. The principle of taxing citizens with the remainder of their income after one year and not their total income takes into consideration the expenses of families and citizens and defines poverty irrespective of total income. The economic principles of the Islamic welfare state would be discussed in a later chapter.

4.6.7 A stable ecosystem and sustainable resources:

In a WHO document prepared in 2002, von Schirnding stated that in the context of human health and the human dimension in general, "ecosystems" refer to the physical, economic and social conditions that support human life (Von Schirnding, 2002, pp 43 - 46). Stability of these conditions and indeed the sustainability of the resources needed to support these conditions are thus paramount in achieving optimum health conditions. A chronology of events between 1815 and 1948 showed the positive effects on public health as a result of legislation and increased involvement of the British government in social welfare as more money and resources were placed at the disposal of the welfare system (Rees, 2001).

The historical data presented previously showed an increasingly stable economic and social welfare system in the Caliphate in that era. Indeed, the historical data showed an increase in Government spending on social welfare and a richer economy from Abu Bakr till the end of Uthman's era. As civil war broke out in Ali's era, historical data showed that Ali still sent secret inspectors to check the welfare in the provinces under his control. Nonetheless, the war did cause thousands of deaths but this occurred at the war front. The civil war was well documented to minute details by medieval Muslim historians. Yet no record of disruption to welfare is recorded. Ali is credited with making sure that both his supporters and his opposition had equal access to the welfare system.

4.6.8 Social Justice and Equity:

The importance of these 2 determinants in modern day public health cannot be over-emphasised. The 1992 Black Report in the UK identified the primary reasons for worsening social gradients in mortality and other indicators of ill health was material deprivation and poverty (Townsend et al., 1992). The Acheson Report (Acheson, 1998b) traced the roots of ill health to such determinants as income, education and employment. Lack of equity would thus lead to unequal and unfair distribution of health determinants (Wilson and Mabhala, 2009, pp 19). The historical data presented previously showed the Caliphate paying out several types of welfare benefits including housing. Unemployment benefits, benefits to the disabled, orphans and abandoned children are all documented in the historical works. In Uthman's era, a new dimension to benefits and pensions was introduced with relatives of pensioners entitled to inherit the pensions if the pensioner dies.

The Righteous Four struck personal examples with regards to social justice. From Omar's austere behaviour during the famine, to Ali's special interest in making sure that Arabs and non-Arabs, supporters and opposition receiving the same amount of benefits, social justice seemed to have been at the top of government welfare policy. This added to the benefits system, abundance in the time of Uthman and an increasingly affluent society would have reduced the causes of ill health and mortality associated with poverty and deprivation.

4.6.9 Child benefits Scheme and Women's benefits scheme:

These schemes were introduced in the era of the Righteous Four and underwent several modifications as previously seen culminating with an increase of the benefits during the era of Uthman. In modern times, the UK has introduced Child Benefits scheme. This originated in 1945 under the Family Allowances Act (almost 1400 years after the Caliphate introduced the scheme). The United States that run an entirely liberal form of social welfare

policy started a Temporary Assistance for Needy Families (TANF) that started only in 1996 under the Clinton administration. Unfortunately, the policy placed a five year time limit on the assistance (Farrell et al., 2008). Women and children were entitled to Medicaid health cover whilst on the programme. The long term results however showed that between 10 – 34% of TANF leavers were uninsured (Acs et al., 2001). The problems are further compounded when it is considered that the child care subsidies were also limited under the TANF policy and were subject to termination after mothers exhaust their 5-year lifetime eligibility for TANF cash benefits. The policy also had an earning threshold which if achieved by the women or mothers, the TANF benefits came to an end even if they were within the 5 year limit. The earning threshold has been judged to be well below the poverty line (Hildebrandt and Stevens, 2009, pp 793 - 801).

The effects on children's health and welfare are obviously huge. In a study of more than 500 low-income mothers of chronically ill children who were under the TANF policy, 64% were not employed because of their own health problems and 56% were not employed because of their child's health. Poor maternal health was associated with need for cash assistance and health insurance. The study warned that social policies promoting employment will fail if they do not address the health needs of poor women and children (Romero et al., 2002, pp 1462 - 1468). In another review paper, the authors concluded that it is apparent that TANF is failing some of the families it was supposed to move toward self-sufficiency. Leaving these families behind without a subsistence safety net creates an urgent need for new ways to support their health (Hildebrandt and Stevens, 2009, pp 793 - 801).

Thus modern research has placed a direct link between welfare benefits to women and children and their health status. The era of the Righteous Four did not place any time limits for benefits to women and children. Orphaned and abandoned children came under the direct

protection of the State, and the benefits were doubled in general terms to women and children with a further increase for children after their first year of life in Uthman's era. Omar's policy of investing the money for orphans in State controlled business ensured a form of insurance for the children and as seen in some instances, the wealth grew tenfold.

4.6.10 Life expectancy:

In this section, the public health policy of the Prophet and the Righteous Four as outlined in the historical section was analysed in the light of modern day public health practice. It is an attempt to get a glimpse of the effects of these policies on the population 1400 years ago. This has not been done previously from a health care perspective and this research provides an analytical study of that period. Whist it is acknowledged that the effects discussed may not be accurate but they show a reasonable correlation between efficient State welfare systems and policies and their positive effect on public health even in the absence of highly advanced medical technology and curative techniques. There have been conflicting reports of the life spans of citizens of the Islamic caliphate.

Initial studies looked at the life span of scholars in the 11th and 12th centuries in different places of the Caliphate and placed them at 72.8 years in the Middle East, 69–75 years in 11th century Islamic Spain (Shatzmiller, 1993) and 75 years in 12th century Persia (Bulliet, 1970, pp 195 - 211). However many scholars felt that religious scholars of Islam had an unusual longer life span that the normal population. Another report suggested that the life span of Muslims in the early Caliphate was above 35 years for the general population (Conrad, 1995) with the neighbouring Roman Empire standing at 20 – 30 years. However, this thesis will attempt to get a glimpse of expected life span of companions of the Prophet Muhammad who are known historically to have followed his instructions in addition to having lived in a welfare state system under the Righteous Four. Again this by no means will answer the

conflicting reports about life spans in that era but will shed light to modern day policy makers on the effect of the social determinants of health and efficient welfare on the life span of a population. In order to get that glimpse the following criteria was used in selecting the sample of companions to be used in this assessment:

1. They must be close companions of the Prophet
2. They must have lived in his time and the time of any of the Righteous Four caliphs
3. Their year of birth and year of death must be clearly documented in the historical works
4. Companions that died in battle were excluded from the sample population.

With the above criteria, 30 very close companions of the Prophet were identified. Their life spans are shown in the next table:

Table 10: Life span of some of the most prominent companions of the Prophet

Name of companion	**Age died**
Abdullah ibn Umar (M)	79
Abu Huraira (M)	78
Abdullah ibn Abbas(M)	69
Abdulrahman ibn Auf (M)	72
Asma bint Abu Bakr (F)	100
Fatima the Prophet's daughter (F)	29
Saad ibn Abi Waqas (M)	69
Salman Al Farisi (M)	76
Abu Ayyub Al Ansari (M)	80
Aisha bint Abu Bakr (F)	66
Amr ibn Al as (M)	91
Bilal ibn Rabaha (M)	60
Abu Bakr (First Righteous Caliph) (M)	61
Abu Ubaidah ibn Al Jarrah (died in Plague) (M)	46
Anas ibn Malik (M)	97
Hafsa bint Umar (F)	57
Khalid ibn Alwaleed (M)	50
Muadh ibn Jabal (died in Plague) (M)	38
Maymunah bint Alharith (F)	80
Zaynab bint Jahsh (F)	51
Zaid ibn Thabit (M)	50
Muhammad ibn Maslamah (M)	75
Abdullah ibn Salam (M)	80
Muawiyah ibn Abu Sufyan (1st Ummayad Caliph) (M)	78
Sa'id ibn Zaid (M)	80
Shurahbil ibn Hassana (died in Plague) (M)	46
Juwayriyah bint Alharith (F)	65
Ramla bint Abu Sufyan (F)	77
Safiyyah bint Huyayy (F)	60
Sawda bint Zam'a (F)	74
Median	**70.1**

As shown the median age was 70.1 which tallies with some of the reports already discussed. The current average life span of individuals in the UK is about 79 years. This suggests that preventive medicine and a welfare system as existed in the time of the Prophet and the Righteous Four and supported by the modern day public health theories may have not only improved the quality of life but also increased the life span of individuals. It must be noted that the above table is a very crude way of evaluating the effect of the policies on life expectancy and it is acknowledged here that thirty individuals may not be representative of a massive population.

However, it is pertinent to point out that the figure not only agrees with other scholars of the era but also mirrors modern day results. Countries with a well-developed social welfare system, adequate income and high education have a much higher life expectancy than developing nations that lack these basic welfare strategies.

The Righteous Four are regarded as the founding fathers of the Islamic Welfare State after the Prophet Muhammad. They applied the policies and set up the structural systems of welfare in a vast State. Their leadership and the high moral standards they set were reflected in the efficiency of the system and the confidence they enjoyed within the population.

The next section looks at the second era of the Islamic Caliphate – the Ummayad era.

Results/Discussion

Chapter 5: The Ummayad Caliphate

Chapter 5

Section 1: The Ummayad Caliphate - Overview

In this chapter, the following topics will be covered:

1. An introduction to the Ummayad Caliphate, including a discussion of the Ummayads.
2. The position of the Ummayads during and after the era of the Righteous Four.
3. The civil war that finally ended with the ascension of the first Ummayad Caliph.

5.1.1: The Ummayad clan:

The Ummayads were a clan from the Quraysh tribe in Mecca. This was a very powerful clan in the Pre-Islamic era and had the leadership of Mecca prior to the Prophet's final victorious entrance to the city. They were prominent businessmen who had extensive trade relationships with several nations including Abyssinia. The third Caliph, Uthman Ibn-Affan, himself a prominent businessman came from the Ummayad Clan.

Most members of the Ummayad clan opposed the Prophet in the beginning of the Islamic era (Hawting, 2000, pp 11). They felt that he was a threat to their leadership, their economy and their influence on the rest of the Arabian Peninsula. The leader of the clan, Abu Sufyan fought the Prophet on several battles. Abu Sufyan was the political leader of Mecca and looked at the Muslims as a potential threat to the way of life of Quraysh. His wife Hind was a powerful woman and herself an avowed enemy of the Prophet and the Muslims in the early period (Al Mubarakpuri, 2002, pp 329).

However, as Islam continued to spread all over the Peninsula, the Prophet's city of Medina continued to become stronger with deterioration in the strength and influence of Quraysh in Mecca. By 630CE, Abu Sufyan converted to Islam and surrendered Mecca to the Prophet His whole family including his wife Hind followed his example (Al-Mubarakpuri, 2002, pp 464).

There is enough evidence that the Ummayad clan including the household of Abu Sufyan did remain loyal to the young Islamic nation. Indeed in one of the most difficult

battles fought after the conquest of Mecca - a battle known as Hunayn – Abu Sufyan remained loyally by the Prophet's side (Al-Mubarakpuri, 2002, pp 478). That loyalty remained until his death.

5.1.2 The Ummayads in the era of the Righteous Four:

After the death of the Prophet Muhammad, several clans and tribes in the Arabian Peninsula defected from the central Government of Medina. These tribes declared a state of war against the Prophet's immediate successor Abu Bakr. As was shown in the historical data, Abu Bakr's two year rule started with suppressing the rebellion and re-uniting the Peninsula under one Government again. Abu Bakr was not from the Ummayad clan.

Historians have unanimously recorded that the Ummayad clan remained loyal to the Islamic Caliphate during the era of Abu Bakr. Indeed, no attempt was made by the Ummayads to use the volatile military situation to restore their political control over Mecca. Rather they stood behind Abu Bakr to fight the insurgents. Abu Sufyan made no attempt to regain his political dominance in Mecca and remained loyal to Abu Bakr.

In Omar's era, the Ummayads continued to show their loyalty to Islam. Abu Sufyan's son, Muawiyah held several political and military positions in Omar's era. Indeed, after the plague of Emmaus, Omar elevated him to Governor of Damascus and the surrounding regions of Greater Syria (Salabi, 2005a, pp 235). This was an extremely sensitive position as the Byzantines were poised at the borders to attack the Caliphate. Muawiyah's loyalty to Omar was clearly unquestionable for Omar to place him in such an important position. It is clear that Muawiyah had no intention to restore his father's pre-Islamic influence on a personal level and followed the dictates of Islam.

The third Caliph Uthman ibn Affan was himself from the Ummayad clan. His Caliphate is classified as part of the Righteous Four and not part of the Ummayad Caliphate as his ascension to the Caliphate had no relationship to his membership of the clan. Uthman

as previously discussed was a superb economist (like many of the members of the Ummayad clan). The Caliphate showed a massive military and economic expansion in his time. However, towards the end of his rule, as previously described, dissidents arrived in Medina asking for the Caliph to step down. Interestingly one of the accusations against the Caliph was that he appointed only members of his clan into positions of power. This has been refuted by many scholars as many of the members of the clan who were in positions of power were already in these positions from the time of Omar – for instance Muawiyah (Salabi, 2005a, pp 235). The assassination of the Caliph in his house caused the first split in the Islamic Caliphate.

The fourth Caliph Ali assumed power immediately after the assassination of Uthman. Muawiyah refused to pay allegiance to Ali until justice was brought against the assassins of Uthman. Muawiyah was from the Ummayad clan just like Uthman and was Uthman's next of kin. Muawiyah backed his position using a verse of the Qur'an that gave authority to the next of kin of a murdered man over the murderers (Qur'an 17:33). Muawiyah demanded justice prior to allegiance. Ali's argument was that allegiance to the State's authority took precedence. The situation deteriorated to civil war with both men moving armed forces towards each other. There were senior companions of the Prophet on either side of the divide.

The next five years saw several wars between the two men. In 661CE, Ali was assassinated by a group of dissidents called the Khawarij who also attempted to kill Muawiyah simultaneously and hence rid the Caliphate of the two men. Muawiyah survived the attack but Ali who never went about with bodyguards was fatally injured (Bewley, 2002, pp 28).

The Muslims on Ali's side immediately chose the grandson of the Prophet, Hassan who was also the son of Ali as the next Caliph. Hassan realised that the only way the civil war was to end was to abdicate in favour of Muawiyah. Months of secret negotiations ensued

between him and Muawiyah. Finally, Hassan abdicated openly in favour of Muawiyah and came under the protection of Muawiyah (Bewley, 2002, pp 30).

5.1.3 The Ummayads after the Righteous Four:

Muawiyah assumed the leadership of the entire Caliphate and once more the Muslim State was united with the exception of the Khawarij group that insisted on a state of non-allegiance to Muawiyah. He moved the capital of the Caliphate from its traditional seat in the City of Medina to Damascus and this would remain for the rest of the Ummayad Caliphate.

Muawiyah ruled for about 20 years and was the architect of much development in the Islamic Caliphate. Prior to his death, Muawiyah declared his son Yezid as the next Caliph thus ushering a dynasty of rulers from the Ummayad clan. For the next 71 years, the Caliphate was passed from one member of the Ummayad clan to another and the supreme position in the Caliphate was exclusive to the clan.

The passing over of power through clan membership was a departure from the preferred method of the Righteous Four where leadership was passed through consensus and consultation. The ninety one years of Ummayad rule saw the Caliphate expand even further. The Ummayad Caliphate is regarded as the 5th largest state in the history of mankind with a total land area of about 5 million square miles and a suggested population of about 33 million at its peak (Blankinship, 1994).

The ascension of Muawiyah's son Yazid was met with stiff opposition by some of the surviving companions of the Prophet. His three year rule was marred with the murder of the Prophet's grandson Hussayn – the younger brother of Hassan at the hands of forces allied to Yazid (Kennedy, 2004, pp 89). The shocking death of the Prophet's grandson further divided the State. Another companion of the Prophet by name of Abdullah ibn Al Zubayr would later create a parallel Caliphate and declared himself as Caliph with his capital in Mecca (Kennedy, 2004, pp 89). Once more civil war broke out. The fourth Ummayad Caliph Abdel

Malik ibn Marwan was determined to re-unite the State. In this endeavour he recruited a general, Al Hajjaj ibn Yusuf, described by many medieval historians to be ruthless to lead the attack on Al Zubayr in Mecca. Al Hajjaj succeeded and defeated Al Zubayr's forces and Al Zubayr was killed (Kennedy, 2004, pp 98). The Caliphate again came under a single rule.

Whilst Abdel Malik made significant contributions to the Ummayad State, towards the end of the Caliphate era, Caliphs had clearly deviated from the path of the Righteous Four and injustice and corruption became apparent to the citizenry of the world's super power of the time. Towards the end, military uprisings became more and more and finally, in 750CE, the Ummayads were overthrown by forces led by another clan of the Quraysh – the Abbasid clan ushering in the Abbasid Caliphate.

The next section will look at the contribution of the major Caliphs of the Ummayad dynasty starting from Muawiyah. Fourteen Caliphs ruled in the 91 year period. The following chapters will discuss the welfare system, its development and subsequent decline and the effects on public health.

Chapter 5

Section 2: The Ummayad Caliphate: Muawiyah Ibn-Abu Sufyan

In this chapter, the following topics will be covered:

1. The personality of the first Ummayad Caliph.
2. The welfare policies of the Caliph.
3. The industrialisation process that occurred in his era.
4. Advancements on the previous era.

5.2.1: Muawiyah – the first Ummayad Caliph:

Muawiyah was a companion of the Prophet Muhammad. He joined the Prophet after the Muslims had regained control of Mecca towards the end of the Prophet's life. Muawiyah had well known political skills. The Caliph Omar had appointed him as Governor of Damascus and later most of greater Syria was placed under his control. His political skills made him handy to deal with the Romans at the Northern borders. During his governorship years under the Caliph Uthman, Muawiyah had convinced the Caliph to initiate a naval fleet to control the Mediterranean Sea which was hitherto under Byzantine Naval control. With the civil war over and his truce with the son of Ali, Muawiyah became the undisputed leader of the Caliphate. Muawiyah ruled from 661CE – 680CE.

His twenty year rule saw massive developments in the Caliphate in the economic, military and welfare sectors. Muawiyah improved on the Byzantine management processes that were prevalent in Greater Syria prior to its annexation to the Islamic Caliphate. He is regarded by Muslim historians as one of the greatest politicians in Islamic history (Salabi, 2005d).

5.2.2 General welfare and policy:

Muawiyah continued the general welfare state of the Righteous Four. He had government agents in every city of the caliphate who would report directly to him the needs of the people. For instance in Medina, his postal agents before departing for Damascus would

ask the people of the city to write personally to the Caliph of their needs (Salabi, 2005d, Vol 1, pp 234; Al-Tabari, 1987, Vol 6, pp 254). Spending on social security increased during the early time of the Ummayad caliphate. For instance, between the period 667CE – 675CE, the poor of the people of Mecca, Medina and Iraq were given social security cards giving each of them State benefits (Salabi, 2005d, Vol 1, pp 264, Khamash, 1980, pp 335). These cards were an improvement in the managerial processes in releasing benefits. In the same field of management, the Ummayad leadership under Muawiyah made no distinction between Muslim and non-Muslim with non-Muslims occupying several key positions in his Government. For instance, his medical advisor was Ibn Athall Alnasrani who was Christian, his financial consultant was Sarjoon ibn Mansoor who was Roman and Ibn Nudheer (another non-Muslim) was his governor over Alsawafi (Salabi, 2005d, Vol 1, pp 302).

The Caliphate's tolerance to other faiths is exemplified when Muawiyah rebuilt the Church of Alraha (also known as Edessa) after it had been destroyed by an earthquake (Holland, 2013, pp 406; Salabi, 2005d, Vol 1, pp 303). In addition, in the era of the Ummayad governor of Egypt, Maslama bin Mukhlid Alansari, the first church was built in the city of Fustat between 667CE and 687CE (Salabi, 2005d, Vol 1, pp 303). Several other economic and social welfare activities occurred in several places in the caliphate by the Caliph's governors. For instance in Iraq, the Governor, Ziad ibn Abu Sufyan who initially governed Basra only between 665CE – 670CE followed by both Basra and Kufa from 670CE – 672CE, enforced several initiatives in the welfare sector. He opened the Department of Sustenance in Basra (Salabi, 2005d, Vol 1, pp 312). The people of Basra had their subsidies from this Department. We have the names of the officials who were appointed in charge of this Department: Abdullah ibn Alharith ibn Nawfal and Rawad Ibn Abibakra. He also appointed an official by the name of Alja'ad Ibn Qais Alnemri as a Market Inspector in-charge of food sales to keep an eye on food prices (Salabi, 2005d, Vol 1, pp 312; Al'Aqaili,

1984, pp 87). He also regularised the benefits system to the Armed Forces and the descendants of the Prophet. He also distributed special monetary dispensation to children during the annual two holy festivals of Islam (Eid el Fitr and Eid el Adha). This amounted to 50 dirhams to each child on each festival (Salabi, 2005d, Vol 1, pp 313; Al'Aqaili, 1984, pp 88).

Ziad also enforced sanitation regulations and appointed officials to look after the sanitation of the cities. Citizens who violated sanitation regulations were punished according to the law (Salabi, 2005d, Vol 1 pp 313; Khamash, 1980, pp 214. He paid special attention to agriculture and built dams and water channels. He awarded agricultural lands to locals and gave each one a maximum of 2 years to farm the land for food production – a policy very similar to that of Omar during the era of the Righteous Four. If the farmer failed, the land was withdrawn and given to another on a waiting list (Salabi, 2005d, Vol 1, pp 314; Al'Aqaili, 1984, pp 90).

5.2.3 Food supply to Pilgrims and children's welfare:

The Caliph ordered the building of major kitchens in Mecca that catered for the pilgrims and the poor who fasted during the month of Ramadan. These were all on the expense of the Government (Salabi, 2005d, Vol 1, pp 235). This policy was already in place and had been expanded by the third Righteous Caliph Uthman but with the expansion of the Caliphate and increased population of the Muslims, these major kitchens were further expanded by Muawiyah.

Children's welfare programmes had already been in place at the time of the Righteous Four but became even more organized and developed in the time of Muawiyah. He appointed an agent to every tribe. Every morning the agent would go around the tribe asking for any new-borns. He would gather the names of the new-borns and record them with the

government offices to ensure that their families received the child's stipend (Salabi, 2005d, Vol 1, pp 261).

This differed from the time of the Righteous Four where it was the parents of the child who had to bring the child for registration with the Government authorities. In Muawiyah's case, it was the Government that actively sought to register these children to make sure that no child was left out if the parents did not come to the Government's office. Again, these stipends were issued to Muslim and non-Muslim families alike.

5.2.4 Communication systems:

The communication system already in place at the end of the Righteous Four era was further modernized by Muawiyah. He seems to have applied a system from the Byzantine Empire. In the time of the Righteous Four, the communication system involved a postal officer on a fast riding horse taking letters and messages to their destination. Muawiyah felt that this was too stressful on postal officers. The Government decided to install postal points on all major roads in the Caliphate. At each point, fast horses with postal officers were stationed. A postal officer would take the messages and letters on a horse or camel for a prescribed distance to the next postal point. Here he would hand over the parcels to the officer on a different horse at that point who would then take it to the next point and so on until the parcels reach their destination (Salabi, 2005d, Vol, pp 223).

In this way, the Government provided a fast and reliable way of communication between the provinces whilst relieving undue stress on postal officers (and transport animals).

Such a development is classified in modern public health under occupational health services with reducing potential health hazards on postal officers (and horses) if they were meant to travel long distances to deliver their parcels. Muslim historians have recorded that the distance between one postal point and the other was about 12 miles (Salabi, 2005d, Vol, pp 223).

5.2.5 Expanding the water supply system:

Historians record that Muawiyah's Government took special interest in providing drinking water throughout the Caliphate. Mecca and Medina due to their strategic positions as holy grounds had special dispensation from the Government in order to provide drinking water to the pilgrims that visited these cities throughout the year. Muawiyah ensured that water wells were built on all major roads of the Caliphate to ensure continued water supply to all travellers (Salabi, 2005d, Vol 1, pp 235; Al-Hashimi, 2002, pp 25).

5.2.6 Food Production and agricultural expansion:

In addition, Muawiyah made sure that certain lands that were not suitable for agriculture were rehabilitated using scientific techniques made by experts at his time. In some areas the increased production amounted to 5 million dirhams. Muawiyah improved the living conditions of people in such territories (Salabi, 2005d, Vol 1, pp 256).

Muawiyah also gave importance to food production and the construction of water channels into lands that had no water and increasing the produce of these lands by use of fertilizers. He employed experts from the local areas to oversee the development of these lands (Salabi, 2005d, Vol 1, pp 266). Several rivers and water channels were constructed in his time. Massive projects involving water purification, digging of wells, redirecting water from rivers through artificial channels, renovation of dams and construction of dams was initiated by the Ummayad Government. The private sector took part in the funding of these projects. Irrigation canals that flowed through privately owned estates came under the responsibility of the owners. These owners funded the purification process and the maintenance of these channels (Salabi, 2005d, Vol 1, pp 269).

The Ummayad rulers encouraged investments in water channel reconstruction and land irrigation. Ummayad rulers built their palaces within desert areas in Greater Syria. These palaces soon became a focal point for projects which included channels and water tanks and

drainage facilities necessary for re-acclamation of desert lands and converting them to agricultural lands for increased food production (Salabi, 2005d, Vol 1, pp 269). For instance in the city of Alghouta in Syria, Muawiyah's son, Yazid expanded a small water channel both in depth and in width which led to higher flow of water volume which consequently increased the amount of agricultural land in the city (Salabi, 2005d, Vol 1, pp 269). Prior to the Ummayad Government's intervention, most lands in Greater Syria depended on rainfall water which fell in specific months of the year. With the Government's agricultural expansion, a new era of agricultural production based on artificial channels came to being. Most of the agricultural products were wheat, malt, rice, olives, palm trees, grapes, figs, several types of fruits and cotton and sugar cane (Salabi, 2005d, Vol 1, pp 270).

This massive investment in agriculture created an economic revolution in the Ummayad period. Businesses that depended on the agricultural products as raw materials were initiated. These included textile manufacturing, "beverage making machines" as in giant squeezers and large scale grinding mills (Salabi, 2005d, Vol 1, pp 272). The resulting economic affluence promoted the building sector and magnificent buildings were built during this era some of which survive till this day as the great Ummayad Mosque in Syria. This in turn created businesses specializing in building materials. Again the cycle of development led to the Caliphate being a major export nation. This led to the manufacture of ships (Salabi, 2005d, Vol 1, pp 272). The next section looks more closely at this particular industry.

5.2.7 The Shipping sector:

This sector had special funding from the Government. The Government pursued a policy of making the Caliphate the strongest naval power in the Mediterranean to oppose the powerful Byzantine Navy. Thus both military and civilian ships were built. Initially, the production of ships in the Caliphate was restricted to Egypt where Coptic Christians were experienced in ship building (Salabi, 2005d, Vol 1, pp 272). In the Battle of the Masts fought

in 655CE during the Caliphate of Uthman ibn Affan, the Muslim navy inflicted a heavy defeat on the Byzantine navy (Kennedy, 2004, pp 71).

By 669CE, Muawiyah ordered a ship building industry to be established in the Syrian city of Aka and he used experts from the Egyptian industry to help set up the new industry. The industry grew fast especially that the raw material of wood was brought in from the mountains of Lebanon which was itself under Caliphate rule (Salabi, 2005d, Vol 1, pp 272). The ship building industry flourished and another major industry was built in Egypt in 673CE. This particularly industry specialized in war ships (Salabi, 2005d, Vol 1, pp 272).

The Ummayad Caliphate continued expanding its ship building industries even after Muawiyah. Interestingly, this industry created the development of whole industrial cities with population settling in these estates. These estates became fertile investment grounds, with temporary housing units and grinding mills (Salabi, 2005d, Vol 1, pp 272). This led to further development of this industry and management became more advanced. Advances in management technique led to the creation of the post of "Industrial Inspector" for each industry (Salabi, 2005d, Vol 1, pp 273). His job was to ensure that the required human resources were available for the efficient running of the industry. In addition, the Industrial Inspector and his team co-ordinated the supply of raw materials to the industrial estate. The Government provided housing units to the employees and their families within the industrial estate. Salaries and compensatory packages were developed for these Government employees and they had their own rest periods (Salabi, 2005d, Vol 1, pp 273). A complaints system was set up to ensure that employees could freely air their grievances and have their complaints sorted accordingly. This management strategy led to a massive surge in production and development of ships in the Ummayad dynasty (Salabi, 2005d, Vol 1, pp 273).

5.2.8 The Translation movement in the time of Muawiyah and medical services:

The medical services regulations had already been set up in the time of the Prophet Muhammad. With civil war over and the Caliphate's massive expansion to include several former Byzantine states and the entire Persian Empire, Muawiyah's government turned its focus on the physical and medical sciences. The Caliphate regarded as a matter of importance the sciences that prevailed in the Byzantine and Persian empires and took upon itself the responsibility of knowledge preservation.

In Muawiyah's reign, he set up a special department of research and translations completely funded by the state. This preceded the well-known and celebrated "House of Wisdom" set up in the Golden Age of the Abbasid Caliphate to be discussed later. Muawiyah's personal physician, the Christian, Ibn Athal Al Nasrani, played a major role in translating available medical works into the Arabic language (Salabi, 2005d, Vol 1, pp 240; El-Najjar, 2001, pp 1717).

However it was Muawiyah's grandson that really took a big step in the translation movement. Prince Khalid ibn Yazid ibn Muawiyah (never became Caliph) translated medical works and works of chemistry into the Arabic language. He collected a group of Greek scholars who had studied in the school of Alexandria in Egypt who also spoke Arabic. He ordered them to translate Greek and Egyptian works in chemistry and medicine (Salabi, 2005d, Vol 1, pp 240). He also ordered them to translate the works of Galen the great physician of the Roman era whose works appear not to have been developed any further as Europe continued in its dark ages. Furthermore he commissioned them to translate works of astronomy and even treatises of warfare (Salabi, 2005d, Vol 1, pp 240). Thus a large library of works was initiated in Damascus. The 13th century historian Ibn Katheer records that in the time of Muawiyah, the number of medical doctors in the Caliphate increased significantly. For instance, the ratio of doctors to population in Basra in the time of Muawiyah was about 1

physician to every 534 persons. This calculation is based on the fact that when the governor of Basra Ziad ibn Ubay was wounded in the hand, he had 150 physicians in Basra attend to him (Ibn-Katheer, 2004, Vol 11, pp 261). The population of Basra at that time was about 80,000 (Salabi, 2005d, Vol 1, pp 240).

Muawiyah's era thus saw the first major step towards the development of Medicine as a science in the Islamic caliphate. It also saw Arabic becoming the unifying language of the sciences and forming a bridge between the knowledge in the East and the West.

The well-known Western scholar of Islamic Medicine, Manfred Ullman in his synopsis of Islamic Medicine makes no mention of the translation movement during this era nor of the developing library in Damascus and dates the translation movement from the time of the Abbasids (Ullmann, 1978, pp 9).

5.2.9 Death, succession and civil war:

Muawiyah died in 680CE. Part of his truce with Hassan son of Ali was that Hassan would become Caliph on the death of Muawiyah. Hassan died before Muawiyah. Muawiyah consulted with senior ministers in Greater Syria on the prospect of making his son Yazid, a military commander, the next Caliph (Salabi, 2005d, Vol 1, pp 412 - 413). As it were, Yazid did become Caliph but only for three years. That period was plagued by severe rebellions (Hawting, 2000, pp 46). The most notable was that of the grandson of the Prophet Muhammad and brother of Hassan, Hussayn son of Ali.

One of Hussayn's major problems was that Yazid became Caliph via a hereditary procedure rather than on merit (Salabi, 2005d, Vol 1, pp 457). As Hussayn made his way to Iraq with a small force, Yazid's governor in Iraq sent a force to intercept him. In a most unfortunate series of events that was to divide the Muslim world, a battle ensued between Hussayn's small force and the Governor's large army. This battle known as the Battle of Karbala ended with the murder of the grandson of the Prophet Muhammad (Hawting, 2000,

pp 50). The news of his death sent shock waves across the Caliphate. It was not expected that the grandson of the Prophet would be killed in such a manner. Here the historical works differ in their judgement on Yazid's level of responsibility in the death of Hussayn. However, his death caused the people of Mecca and Medina to break away from the central authority of Damascus and the parallel Caliphate under Abdullah ibn Al Zubayr was created as previously described.

With Yazid's death in 683CE, his son Muawiyah became caliph. However even in Greater Syria, his authority was not entirely recognised. His reign was quite short and he died in 684CE (Hawting, 2000, pp 40). With his death, another Ummayad, Marwan ibn Al Hakam became Caliph. This still did not stop Abdullah ibn al Zubayr from continuing his claim to the Caliphate from Mecca. By now Abdullah ibn Al Zubayr had controlled not just the Peninsula but also Iraq and Egypt (Hawting, 2000, 48). Civil war was now effectively in place as the Caliph in Damascus fought his rival in Mecca. Marwan died in 685CE. His son Abdel Malik assumed the role of the Caliph in Damascus. He came to power at a time when there was complete disarray in the Islamic Caliphate. The next chapter will look into the eras of Abdel Malik and his son Al-Walid.

Chapter 5

Section 3: The Ummayad Caliphate: Abdel Malik Ibn-Marwan & Al-Walid Ibn-Abdel Malik

In this chapter, the following topics will be covered:

1. The significant events in the era of both Caliphs will be discussed
2. The industrial revolution that continued in the era of both Caliphs
3. The birth of the first State funded hospital in the Islamic Caliphate
4. The uprisings that occurred in their time

5.3.1 Abdel Malik Ibn-Marwan as Caliph:

Abdel Malik Ibn-Marwan ruled from 685CE – 705CE. His first step was to re-unify the Caliphate of Islam. However it was hard to convince the Caliph in Mecca, Abdullah Ibn-Al-Zubayr to abdicate in his favour. Abdullah was well-known as a righteous man and was himself a companion of the Prophet Muhammad and did not accept the hereditary succession in the Caliphate or that only one family should have the right to power within the State of Islam. War broke out between the two men (Hawting, 2000, pp 48).

At the same time, Abdel Malik created a single currency for use within his dominion thus liberating his Caliphate from the monopoly of Byzantine coins (Hawting, 2000, pp 65). Abdel Malik sent his general Al-Hajjaj Ibn-Yousef towards the Peninsula for a final showdown with Abdullah Ibn-Zubayr. After a siege and a battle that led to damage of the Kaaba (Islam's holy house in Mecca), Abdullah Ibn-Zubayr was killed and the whole of the Caliphate was effectively under Abdel Malik (Hawting, 2000, pp 49). Apart from few uprisings, his 20 year rule could be called stable and he made many reforms (Kennedy, 2004, pp 103).

5.3.2 Economic reforms in the time of Abdel Malik Ibn-Marwan:

Many economic sectors were developed in the time of this Caliph which increased the affluence of the State.

The trade routes of the Caliphate were vast and the following trading sectors were further developed (Salabi, 2005d, Vol 1, pp 692 – 693):

1. The cloth manufacturing sector: This expanded and developed greatly.
2. The building industry: Again this expanded greatly in the time of Abdel Malik and the Ummayad dynasty in general. The Dome of the Rock in Jerusalem and the giant Ummayad mosque in Damascus (present till this day) testify to this development. In addition internal decorations were produced on an industrial level. This included the use of ceramics in interior decorations. The Dome of the Rock in Jerusalem came as part of a rejuvenation project of the Holy Mosque in Jerusalem. Abdel Malik had assigned a huge amount of money for the project. At the end of the project there was still a lot of the money still available. The Caliph ordered that the gold coins be melted and used to coat the Dome of the Rock.
3. The Ship building industry: Again this increased in the time of Abdel Malik. A ship building industry was created in Tunis with about a thousand employees. A special canal 12 miles long was constructed around the industrial area. Further industries were built in Bahrain and Iraq.
4. Other sectors:
    a. Metal work
    b. Wood
    c. Jewellery

The economic reforms made the State very rich. As a show of balance of power and equity, Abdel Malik made sure that the Government did not interfere in the Justice Department nor with the work of the judges (Salabi, 2005d, Vol 1, pp 701).

The death of Abdel Malik in 705CE brought his son Al-Walid Ibn-Abdel Malik as Caliph.

5.3.3 Al-Walid Ibn-Abdel Malik & the birth of the State Funded Hospital (Bimaristan):

In the time of the Caliph Al-Walid Ibn-Abdel Malik, the first dedicated specialist hospitals started to appear in the Caliphate. In the year 706 CE, he ordered the building of a hospital for lepers in Damascus. He employed the skilled doctors of his time to run the hospital. He assigned to the hospital its own budget to look after the patients and the staff (Salabi, 2005d, Vol 2, pp 76).

The modern day historian Salabi cited the work "*Islamic Hospitals*" by the scholar Al-Saeed who stated that soon several hospitals dealing with lepers were built throughout the Caliphate in the same design and management as the Damascus hospital. This hospitals were not spiritual healing centres but medical institutions that treated the lepers with the then known medical techniques available (Al-Saeed, 1987, pp 188). These hospitals took the name of Bimaristans from the Persian language meaning "place of the sick" (Al-Saeed, 1987, pp 188; Salabi, 2005d, Vol 2, pp 76).

These hospitals would soon expand their specialisations in the Abbasid era. The well-known western historian Roy Porter in his book on the history of medicine makes no mention of the Leprosarium built by Al-Walid in 706CE though he cites that by 1225 CE there were around 19,000 leprosaria in Europe – 500 years after the Damascus institution. Furthermore, the description he provides for the leprosaria in Europe is completely different from the description given by the Muslim medieval historians on the Damascus institution. The European leprosaria were merely shelters for the sick and as leprosy declined "some became hospitals" (Porter, 2006, pp 182). The description provided by the Muslim medieval historians on the institution set up by Al-Walid, where skilled physicians visited the sick, prescribed medications and the patients were nursed appears to fit more with the description of a proper hospital as we know it today.

5.3.4 General welfare:

Furthermore in the time of Al-Walid, dispensation to the weak and poor was such that he forbade them from asking others as he dispensed to them their needs. Blind people were also given dispensation (Salabi, 2005d, Vol 2, pp 76). In addition, to every disabled person he allocated a servant and to every blind man he allocated a guide (Salabi, 2005d, Vol 2, pp 76; Ibn-Katheer, 2004, Vol 12, pp 609). He gave special dispensation to the roads leading to the Holy grounds of Mecca and Medina to make it easy for the pilgrims and instructed his Governor in Medina Omar Ibn-Abdel Azeez (later to become Caliph himself) to increase the water wells and supplies in Medina and to employ officials to help in the delivery of water to the pilgrims (Al-Tabari, 1987, Vol 7, pp 337).

Al-Walid was succeeded by Sulayman Ibn-Abdel Malik who was his brother. This Caliph ruled for a short while and on his death, he passed the Caliphate to his cousin Omar ibn Abdelazeez.

5.3.5 Social justice and equity:

Despite the welfare dispensations in the era of both Abdel Malik and Al-Walid, historians do record several episodes of injustice in the era of both Caliphs. Al-Hajjaj who was their Governor in Iraq and who was instrumental in the re-unification of the Caliphate under the Ummayads was, according to several medieval historians, guilty of several acts of injustice. He was brutal against any opposition to the Ummayad rulers (Kennedy, 2004, pp 101 - 102). Unlike the era of the Righteous Four, troubled areas may have been denied the social welfare systems and some Ummayad rulers distributed wealth to their allies rather than the equitable way that was present at the time of the Righteous Four. In addition massive amounts of money were amassed by some members of the Ummayad family which only increased the discontent of the population especially that some members of the population had witnessed the later era of the Righteous Four and the era of Muawiyah and could see the

clear difference in the leadership. Uprisings were frequent in the time of Abdel Malik especially in Iraq where Al-Hajjaj tried to brutally quell them (Kennedy, 2004, pp 102). Unlike the civil war between Muawiyah and Ali where the State's institutions still functioned, it appears that the unrest in the Ummayad period did distort the welfare system in the hot spots of the Caliphate (Kennedy, 2004, pp 102)

As a consequence of the non-uniformity of the welfare system and the continuous uprisings, this in public health terms would mean that there were wide health inequalities within the State. The uneven distribution of wealth would have created a widening socio-economic gap further heightening the health inequalities. Indeed historians have recorded that there was discontent within much of the Ummayad Caliphate. It is interesting that despite the picture given by medieval historians of the piety of both Abdel Malik and Al-Walid, they did allow Al Hajjaj to continue his brutal operations in Iraq. The rise of Omar Ibn-Abdelazeez to power however changed the face of the Ummayad Caliphate as would be seen in the next chapter.

Chapter 5

Section 4: The Ummayad Caliphate:

Omar Ibn-Abdelazeez

In this chapter, the following topics will be covered:

1. The personality of the Fifth Righteous Caliph
2. His welfare policies
3. The affluence of the State in his era
4. Animal rights in his era

5.4.1 Omar Ibn-Abdelazeez as the "Fifth Righteous Caliph":

This Caliph has been regarded by historians as the "Fifth Righteous Caliph". He came from the Ummayad family and was indeed the cousin of the previous 2 Caliphs (Sulayman and Walid). On his mother's side, he was the great grandson of the second Righteous Caliph, Omar Ibn Al-Khattab. Western historians have sometimes referred to him as Omar II (Kennedy, 2004, pp 103).

On assuming the position of Caliph, Omar took the same path as the Righteous Four. His first step was to relinquish all his wealth gained under the previous Ummayad Caliphs back to the State treasury. He followed that by taking all the wealth of the Ummayad family members that were gained simply because of their position as members of the ruling family back to the State Treasury. This obviously made him a lot of enemies within the powerful family but the Caliph was unperturbed. He then changed the governors of the provinces and appointed governors known for their competence (Kennedy, 2004, pp 106).

The Caliph quickly re-instituted the welfare justice of Islam as was known in the era of the Righteous Four. The historical narratives seemed to suggest that this "restoration" meant that after Muawiyah, there was certainly some injustice in the Caliphate from the ruling family even if there were achievements. Omar became quickly loved by the people.

His famous statement regarding the rights of the ruling Ummayad family was:

"as for the public funds, their right on it is exactly as the right of any man" (Salabi, 2005b, Vol 2, pp 132).

In this statement, the Caliph had insisted on social justice and narrowing the inequality gap. In another step, he asked officials to announce in the whole length and breadth of the Caliphate that anyone who had been dealt with unjustly by any Governor or member of the Ummayad family could now raise his complaint to the new governors and officials and to himself personally. Lands, money and wealth were returned to oppressed subjects (Salabi, 2005d, Vol 2, pp 134). The medieval scholar Ibn-Al-Jauzi has been cited by modern scholars in reporting that all previous governors and officials that had been found guilty of oppression were deposed by the Caliph. Erasing the injustice from the land was not just confined to injustice against Muslims but to non-Muslims as well. This was exemplified in his reduction of the increased taxes on the non-Muslims of Iraq and Cyprus (Salabi, 2005b, Vol 2, pp 135; Ibn-Al-Jauzi, n.d., pp 50).

Omar had previously vowed to put Al-Hajjaj (the brutal Governor of Iraq) to death once he became Caliph. Al-Hajjaj however died in the era of Al-Walid. The records of medieval historians on the actions of Omar II clearly show that the Ummayad Caliphate had departed to some extent from the Islamic teachings of Government, welfare and justice as practiced by the Righteous Four and that Omar II's rule was restorative of the era of the first four Caliphs.

5.4.2 Basic human necessities in the time of Omar Ibn-Abdelazeez:

The Caliph ordered that those who were in debt and could not pay their creditors provided it was not as a result of illegal trade, the State would pay off their debt. His governors reported back to him that some of those in debt had a house with all its necessities, a horse/camel as means of transportation and a servant. Governors felt that such people were not entitled to State money to pay off their debts. The Caliph replied that these were basic necessities for the citizens of his Caliphate and they should not part with these necessities in

order to pay their debts. He then re-affirmed that such individuals should still have their debts paid by the State (Salabi, 2005d, Vol 2, pp 234).

This was a landmark development in the Ummayad era. Omar II had defined categorically that the fundamental material human rights included housing, transportation and help when needed. In the event of overburdening debt, a citizen should not be evicted from his home and the State was obliged to intervene. This action suggests a State which is affluent and confident that it can handle such an economic burden. In the Chapter on Islamic Economics, data will be presented on the wealth of the Ummayad State but it has to be understood that in this Caliph's era, due to the trust the population had in his leadership, the masses paid their taxes readily to the State further increasing the State's affluence.

5.4.3 Social Security System:

Omar re-instated the full security system of the Righteous Four and Muawiyah which had faltered after Muawiyah and was not applied to all citizens. He even went as far as paying the bride price (dowry) for men who could not afford it so that they can get married (Salabi, 2005d, Vol 2, pp 236). He also ordered that non-Muslim citizens who had attained old age and had no one to cater for then should come under the care and protection of the State (Salabi, 2005d, Vol 2, pp 238). He also increased the State benefits to the poor. He continued the policy that to every blind man was appointed a guide (Salabi, 2005d, Vol 1, pp 264). With orphans, not only were benefits paid but he then appointed State paid foster carers to look after the orphans that were not adopted. Historians have recorded that to every 5 orphans was appointed a foster carer. In addition, to every two individuals with chronic illnesses, a carer was employed (Salabi, 2005b, Vol 1, p 264).

Non-Muslims were included in the social welfare state system (Salabi, 2005b, Vol 2, p 238 - 239). The unjust taxes that were levied in some parts of the vast Caliphate on some non-Muslim tribes were reversed. He re-established peace, security and social justice.

Historians have documented that he made sure people had peace of mind that their rights were protected (Salabi, 2005b, pp 240 – 241). He increased the building of the nation's infrastructure and the economy prospered in his time tremendously (Salabi, 2005d, Vol 2, pp 310). The uprisings that were frequent with his predecessors died down in his era due to the social justice system that was now fully operational.

In the agricultural sector, he increased food production by stamping out the unjust taxes put on farmers (Salabi, 2005d, Vol 2, pp 312). He also maintained the great water channel connecting the Nile to the Red Sea to make it easy for food transportation between Egypt and the Arabian Peninsula. Several other water channels were created in his time including one in the city of Basra called River Adi (Salabi, 2005d, Vol 2, pp 314). After consultations with the scholars of his time the following categories of people were given special dispensations in his government (Salabi, 2005b, Vol 2, pp 322; Salabi, 2005b, pp 253 - 256):

1. Those with congenital disabilities
2. Those with acquired disabilities as those who were injured in their work place or soldiers disabled during war
3. Those with chronic illness
4. Prisoners
5. Poor workers without a constant income
6. Hemiplegics

In addition he ordered in a famous letter to his governors:

For prisoners he wrote:

> "Do not leave any prisoner in chains, give them good food and clothes for winter and summer" (Salabi, 2005d, Vol 2, pp 324).

He in addition ordered more Rest Houses on the highways of the Caliphate and instructed governors to make sure that travellers are well taken care of at the expense of the State. He instructed that travellers who were lost were to be escorted to their destinations at the expense of the State (Salabi, 2005d, pp 324).

5.4.4 Animal rights:

Omar ibn Abdel Azeez ordered kindness to animals. He forbade oppression and torture of animals. He forbade the use of metal at the end of the whips used on animals including the carriers of his communications department (Salabi, 2005d, Vol 2, pp 142). He also forbade heavy bridles on the animals. In addition, when he heard that camels were overloaded in Egypt, he sent orders to his Governor there that the maximum weight for the average camel was 600 pounds (Salabi, 2005d, Vol 2, pp 142).

5.4.5 Death of the Caliph:

This honeymoon period lasted only about three years and the Caliph died. He died at quite a young age with historians reporting that he was thirty nine years of age when he died. He had taken over the Caliphate at the age of thirty six and in three years had changed the face of the Ummayad dynasty completely giving that generation a glimpse of the era of the Righteous Four as he adopted traditions similar to that of Omar ibn Al Khattab (Kennedy, 2004, pp 106 - 107). The Caliph's death at such a young age and the abrupt end to his rule had stimulated medieval historians to speculate that his death was not a natural one.

Some historians have suspected that Omar II's death was by poisoning (Salabi, 2005b, pp 308). Considering the large amount of enemies the Caliph had made himself within the powerful Ummayad family by confiscating their wealth and returning it back to the State treasury, such a suspicion is indeed very plausible. It was an unfortunate state of affairs as the death of this Caliph marked the beginning of the rapid decline of the Ummayad Caliphate. Indeed thirty years later, the Ummayad Caliphate ended in a bloody revolution. The next

chapter looks at a modern analysis of some of the policies undertaken by the Ummayad Governments.

Chapter 5

Section 5: The Ummayad Caliphate: Analysis

In this chapter, the following topics will be covered:

1. Occupational health in the era of industrialisation
2. The care of the disabled in the era of the Ummayads.

5.5.1 Occupational health:

The historical section provided data concerning the management of the shipping industrial sites in the early Ummayad period. The data showed that adequate social care was provided for workers in the industrial estate. Indeed Omar II's era ushered in a compensatory welfare package for those that sustained injuries at work or at war. This welfare principle allowed this vulnerable group of individuals to live in a continual protected socio-economic class that was unaffected by their injuries. The importance of such welfare packages has been studied in recent times. In the modern world, over a 1000 workers die daily from work hazards and 5000 die due to occupation related illnesses (Hämäläinen et al., 2006, pp 137 – 156; Hämäläinen et al., 2007, pp 28 - 41). The WHO Commission on the social determinants of health employment conditions network (EMCONET) recently stated:

> "The more deprived a worker's social class, the higher are his or her chances of experiencing occupation-related hazards, including, among others, physical strain, increased noise and air pollution, low job control, shift work, and monotonous work" (Benach et al., 2010).

In Muawiyah's estates, the social welfare status of the workers and their families was taken care of by the State. They were in regular paid jobs, they had adequate housing and indeed had a system of complaint to ensure that injustice and inequalities were at a minimum. Such principles practiced by Muawiyah's government mirror WHO recommendations for occupational health. The Caliphate's principles in handling industrial estates and the social

welfare of workers in these estates can be compared with the situation almost twelve centuries later in 1845 in Bradford, England. There were about 10,000 wool combers living in Bradford at the time. A report published in that year reported on the social welfare of these workers. A particular location for these workers was Nelson Court. The report described it thus:

"There are a number of cellars in it utterly unfit for human dwellings. No drainage whatever. The Visitors (those compiling the report) cannot find words to express their horror of the filth, stench and misery which abounds in this locality, and were unable to bear the overpowering effluvia which emanates from a common sewer which runs from the Unitarian chapel beneath the houses. Were this to be fully described, the committee might subject themselves to the charge of exaggeration. We trust that some of those in affluent circumstances will visit these abodes of misery and disease" (Rees, 2001, pp 113).

The report is in stark contrast to that reported by the medieval historians on the situation in Muawiyah's estates. A further critical analysis of the above report shows that the "affluent" rather than the State were being trusted to intervene on behalf of the workers. This would naturally depend on the goodwill of some of those who are rich and placed no responsibility whatsoever on the Government of the time to put in place a system of social welfare and decent housing for the workers.

Regarding another location in the same city, Holgate Square, the report was:

"..a miserable hole, surrounded by buildings on all sides. This place resembles a deep pit – no chance of ventilation; a number of men and women work in the cellars near charcoal fires. Seven feet below the surface" (Rees, 2001, pp 113).

There is no doubt that poor sanitary conditions in any industrial estate contributes to poor health of workers. Lack of worker empowerment also leads to deterioration of their health. The industrial workers under Muawiyah had an inspector who looked after the social needs of themselves and their families. Stress at work is an important determinant of health. Lack of control of work and poor working conditions have been reported to increase the level of stress and disease amongst workers and this has been studied in modern times. Suboptimal working environment has had the same effect on health as unemployment in general (Wilkinson and Marmot, 2003). Research has shown that unemployment, job insecurity and poor conditions at work can cause premature death and increased risk of heart disease (Wilkinson and Marmot, 2003).

It has to be emphasised that the medieval historians have clearly documented that the industrial cities of Muawiyah and indeed Abdel Malik were not some form of slave labour. On the contrary these were skilled workers who were employed from all over the vast State, they were paid and were given adequate housing and a complaint system as described. The fairness of the work place has taken prominence in the UK recently with regards to social policy. The UK put a strategic plan to counter lack of justice and equity at work in a document that has been recently released. The strategy included a "flexible, efficient and fair" labour market with adequate income for workers and "helping people to find and stay in work" (GOV, 2014b).

The UK introduced legislation and enforced a national minimum wage rate and introduced flexible working practices for parents (GOV, 2014a). The combined legislation and improving living standards of workers appear to be similar to the Caliphate's social policy with regards to industrial workers almost fourteen centuries earlier. While the UK has been criticised that it still has not achieved fairness that its social policy attempted to

implement, there is no such record of criticism in Muawiyah's time (and there are criticisms of Muawiyah's era in the history books especially his choice of his son to succeed him). However, in Abdel Malik's time, whilst there is no record of specific incidents, it is possible that the policy was not implemented as rigorously as it was in Muawiyah's time.

The situation did worsen after the era of Omar II. In either case, the argument can be made that the social policy regarding workers' wellbeing was present in the Caliphate. It shows again that the social determinants of health are universal in both place and time and if the research in modern times shows that improved working conditions, job security and empowerment of workers would improve health, there is an argument to extend that to Muawiyah's estates.

5.5.2 The Ummayads and Care of the Blind

As shown in the historical section, this was started during the era of Al-Walid Ibn-Abdel Malik and developed further in the time of Omar Ibn-Abdelazeez. The care of the blind is an important policy in public health to the extent that the WHO has dedicated a "World Sight Day".

To understand the effect of blindness, in 2009, there was an estimated 800,000 people blind in Egypt alone with almost 75 million people worldwide estimated to be blind by 2020 if no interventions are made (WHO, 2009). In a study from Germany on the causes of blindness, the authors advocated appropriate social support services for blind people (Finger et al., 2011, pp 1061 - 1067).

Indeed in another study on the risk profile of older patients with blindness, the authors found that most of the older patients were poorer, less educated and had less physical activity than their non-blind counterparts (Jones et al., 2010, pp 400 - 410). The two Caliphs may not have had the medical and surgical technologies available in their time to treat blindness, but

they certainly provided the social frame-work to protect this vulnerable group of patients. Providing blind people with a guide would have encouraged them to do more physical activity, integrate with their society and have access to other social amenities. It is unfortunate that in modern day Egypt, such Government dispensation does not exist.

The study by Jones et al (2010) above also provides an argument on the importance of social welfare. Blind people were poorer. The Caliphate did have its social welfare system to look after the poor anyway whether they were blind or not. Adding special dispensation to the blind especially in Omar II's era would have solved the problem of poverty and disability simultaneously.

Conversely though, as the social justice system in the later parts of the Ummayad Caliphate deteriorated significantly, it would be expected that the social welfare system also deteriorated: the historical data documents such deterioration and that the continuous uprisings against the Ummayads that finally led to their downfall was indeed due to the social injustice that was becoming relatively widespread in a region that was used to a somewhat lucrative welfare system as was demonstrated by Omar II. Inevitably, the poor and the blind would have suffered and their health would have deteriorated.

5.5.3 The congenital disabilities benefits

This was one of the earliest known Government benefits given directly to individuals with congenital problems causing disabilities. This special dispensation appears from the historical data to have been specific to Omar II's measures. The Caliph's recognition of the human rights of these individuals in the 8th century CE is striking. The measures can be identified in present OECD nations where:

"At present, 6% of the working-age population receive a quasi-permanent disability benefit on average in the OECD area, and this share is already close to 10% in some countries.

Spending on sickness and disability benefits is around 2% of GDP and over 4% in some cases" (OECD, 2009).

By providing benefits to this group of individuals, the Caliphate attempted to re-integrate them into society. Omar II's policy could again be traced to his understanding of the Qur'anic law previously quoted:

"It is no fault in the blind, nor in the one born lame, nor in one afflicted with illness…."
(Qur'an 24: 61)

Indeed the historical data is also rich in the actual amounts paid to some of the disabled individuals. As an example the Caliph paid 50 dirhams for each of the crippled in the city of Basra (Hasan-uz-Zaman, 1991). The Caliph's style of leadership closely resembles that of the Righteous Four and it is no surprise that he has been nicknamed the "Fifth Righteous Caliph" (Salabi, 2005b). The ability to classify disabled individuals in Omar II's era shows an evolution in the management affairs of social welfare and an advancement on previous policies.

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Chapter 5

Section 6: The Ummayad Caliphate:

The Decline

In this chapter, the following topics will be covered:

1. The different uprisings that caused unrest within the Caliphate.
2. Factors that led to the final overthrow of the Umayyads.
3. Public health in the era of the decline.

5.6.1 The Decline and the beginning of uprisings:

Following the death of Omar Ibn-Abdelazeez, Yazid Ibn-Abdel Malik became Caliph. Unfortunately, he did not have the faith or capabilities of Omar. Historians report that Omar's legacy only lasted 40 days into Yazid's caliphate before he reintroduced some of the unjust edicts that Omar had removed (Salabi, 2005b, Vol 2, pp 384). Unfortunately, as injustice spread several uprisings occurred in the Caliphate

The major ones included (Salabi, 2005b, Vol 2, pp 387 - 390):

1. The uprising of Yazid Ibn-Almuhallab; 720CE (crushed).
2. The Khawarij uprising (719CE), unsuccessful (but not totally crushed).
3. The Bilay movement in Andalusia (started 721CE - successful to a certain extent in gaining land).
4. The Akhila movement in Andalus (started 718CE – crushed).

In addition wars were continuous with the Turks in the east and the Armenians and the Romans to the North (Salabi, 2005b, Vol 2, pp 395). These had their toll on the economy of the State especially the internal crisis. There was a decline in social security as the Caliph spent money for his own political interests and not necessarily on those who needed it as in the time of his immediate predecessor. That is not to say that no poor people got their benefits but it was certainly not as generalised as in the time of Omar II or Muawiyah or the Righteous Four. This allowed corruption to return to the Government

with several members of the Ummayad family claiming land unlawfully (Salabi, 2005b, Vol 2, pp 396).

5.6.2 The Caliph Hisham Ibn-Abdel Malik

The Caliph Yezid was succeeded by Hisham Ibn-Abdel Malik. Hisham attempted to return some social justice back to the Caliphate. He had a humble nature and opened his doors to the common citizens to approach him directly. Unfortunately however, he could not return the system of Omar Ibn-Abdelazeez. Members of the Umayyad family controlled most of the agricultural lands and the economy once again returned to the hands of the Ummayad family (Salabi, 2005b, Vol 2, pp 445).

During his reign, a problem occurred in the agricultural sector due to water supply in the Iraqi Province. His governors tried to alleviate the problem by increasing the water supply via the building of dams and new water channels. For instance, in the city of Mosul, he instructed his governor to create a huge water channel. This channel cost 3 million dirhams to construct and took a total of 13 years (Salabi, 2005b, Vol 2, pp 445). In addition, dams were built on the river Tigris and several more channels created. Furthermore, the Caliph's brother Masalamah Ibn-Abdel Malik, constructed a huge dam on the Euphrates Island on the River Blikh which helped increase the agricultural production in the area.

With regards to the salaries of the workers, anyone who opposed the Ummayad rule had no salary or pension and his name was removed from the records of the State's Treasury and only the Caliph could order the re-instatement of such a person (Salabi, 2005b, Vol 2, pp 447).

Again several internal uprisings occurred in his time (Salabi, 2005b, Vol 2, pp 467 - 473):

1. The uprising of Zeid Ibn- Ali Ibn-Al-Hussein (crushed).

2. The Berber uprising in North Africa (734CE): this was due to the injustice of their governor Ubaidullah Ibn-Alhabhab. At a point in time, the western part of North Africa declared independence from the Caliph in Damascus. However by 742CE, the Ummayad Caliphate's armies returned these lands back to the Caliph's authority.

5.6.3 The Caliph Al-Walid Ibn-Yazid Ibn-Abdel Malik:

Hisham was succeeded by Al-Walid Ibn-Yazid Ibn-Abdel Malik. This Caliph's era saw a massive deterioration in Ummayad rule. His initial start seemed welcoming as he increased the benefits and pensions to the citizens of Syria and distributed presents and necessities to their children. In addition he increased the salaries of all government workers by 10 dirhams (Salabi, 2005b, Vol 2, pp 485). He increased food production in Syria by increasing the water irrigation systems and increasing the salaries of farmers (Salabi, 2005b, Vol 2, pp 486). However, his management of the affairs of the Caliphate led to a speedy deterioration.

The Caliph went on to persecute several powerful ruling members of the Ummayad family when they refused to give allegiance to his son to become the next Caliph. As such, members of the ruling family rallied around Yazid Ibn-Al-Walid Ibn-Abdel Malik who then planned an overthrow of the Caliph (Salabi, 2005b, Vol 2, pp 490). Yazid planned the overthrow in a careful and calculated manner. His army moved into Damascus at a time when the Caliph and his top officials were away from the city. This was due to an outbreak of plague in Syria. The Caliph abandoned the city fearing the disease. In addition, his governor Abdel Malik Ibn-Muhammad had also abandoned the city fearing the disease (Salabi, 2005b, Vol 2, pp 499).

In 744 CE, Yazid entered Damascus with his forces. It was a quick take over. Forces were then sent to place where the Caliph was. The Caliph heard of the uprising and prepared his defences. However those defences were weak and the revolutionary forces soon surrounded his abode. He attempted to negotiate with the revolutionaries reminding them of his favours

on them. Their leader replied that the uprising happened because the Caliph had committed crimes against the laws of God. Soon his fortress was stormed by the revolutionaries and the Caliph was killed. His death caused a weakness in the Caliphate and loss of respect for its authority and a great division in the Ummayad family (Salabi, 2005b, Vol 2, pp 503).

5.6.4 The Caliph Yazid Ibn-Al-Walid Ibn-Abdel Malik and the final collapse:

The Caliphate went to Yazid Ibn-Al-Walid Ibn-Abdel Malik. He however only ruled for 6 months and died. Some say he died of the plague (Salabi, 2005b, Vol 2, pp 511). His brother Ibrahim Ibn-Al-Walid became Caliph. His rule only lasted 4 months as an uprising in Homs in Syria led by Marwan ibn Muhammad toppled the Caliph. Marwan became the last Ummayad Caliph (Hawting, 2000, pp 117 - 118). He came to power over a nation already divided and ruled by a divided family. A nation where social justice had fallen and social welfare declined. Several uprisings started from the beginning of his rule. Some of these include:

1. Homs uprising: 744CE (Salabi, 2005b, Vol 2, pp 516; Tabari, 1987, Vol 8, pp 197)
2. Alghouta uprising 744CE (Salabi, 2005b, Vol 2, pp 516; Tabari, 1987, Vol 8, pp 198)
3. The Palestinian Uprising 744CE (Salabi, 2005b, Vol 2, pp 517; Tabari, 1987, Vol 8, pp 199)
4. The Hijaz uprising 745CE (Salabi, 2005b, Vol 2, pp 519; Tabari, 1987, Vol 8, pp 295)
5. Abdullah ibn Muawiyah 744CE (Salabi, 2005b, Vol 2, pp 519; Ibn-Katheer, 2004, Vol 13, pp 213)
6. The uprising of Suleiman ibn Hisham ibn Abdel Malik 744CE (Salabi, 2005b, Vol 2, pp 521)

All the above uprisings were crushed one way or the other by the Caliph Marwan but they served to weaken the Ummayad rule. Finally came the Abbasid uprising which was to end the Ummayad rule and establish the Abbasid caliphate.

5.6.5 The Decline and Public Health:

The above historical data would denote significant deteriorations in the social determinants of health. Peace was mostly disturbed even on an internal basis. The level of corruption was clearly on the rise with powerful members of the Ummayad family reclaiming wealth that was confiscated by Omar II. This would have reduced the amount of money available for social welfare especially as powerful members and indeed Caliphs themselves attempted to buy alliances.

Benefits and salaries were denied to opposition groups. This could be compared to the era of the fourth Righteous Caliph Ali who paid the salaries and benefits to those who opposed him as well. The denial of benefits and salaries would have further widened the already existing health inequalities gap.

The later period of the Ummayad dynasty is almost devoid of historical data with regards to welfare developments and benefits systems. This historical lack of data is in contrast with the rich data available in the era of the Righteous Four, Muawiyah and Omar II. It has to be remembered that most of the medieval historians were writing their chronicles in the era of the Abbasid Caliphate. The style of writing of these historians as described previously was that they recorded the information that was available to them. The scanty data available on welfare and benefits in the later part of the Ummayad dynasty would suggest that the system had deteriorated significantly.

Some Western historians have suggested that the medieval historians writing in the Abbasid era would have deliberately omitted several of the developments of the Ummayad dynasty to please the Abbasid rulers of the time. This view (whilst well respected) does not

seem consistent according to the research shown in this thesis. The medieval historians writing in the Abbasid era have glorified the rule of Muawiyah and Omar II. In addition, a lot of the developments that happened in the era of Abdel Malik and Al-Walid were documented by these same historians. The presence of the Abbasid rulers did not deter these scholars who were well-known at the time and were even patronised by some of the Abbasid rulers to deliberately ignore the data that glorified these Ummayad rulers.

This is important as the Abbasids were enemies to the Ummayads but did not force the historians of their time to deliberately ignore the Ummayad achievements in their writings. This is proven by the actual historical data about these rulers that has already been presented in previous sections which is traced back to the work of the medieval historians in the era of the Abbasids.

As such, the lack of data on welfare at the later time may be taken as a sign of the deterioration of the system due to the recurrent uprisings and indeed the corruption that appeared to have been in existence in that era.

If the above argument is taken further, it suggests that public health would have deteriorated during this period as well. As the social determinants of health regressed, so would have the health of the population. As the corruption continued – so would the health inequalities gap been widened. In the absence of a strong social welfare safety net, it could be assumed that individuals and families who had hitherto enjoyed a healthy life due to the State benefits would have started to suffer in their general health. Furthermore, as modern research previously cited has shown, women and children would have suffered health problems as well due to the volatile situation. Disabled individuals would have been especially vulnerable as by the time of Omar II, these appeared completely depended on State help. An exception to this vulnerability may be those disabled individuals who either had rich relatives or who were themselves members of the Ummayad family.

A very worrying historical incident which surprisingly was not commented upon by the medieval historians that recorded it is the flight of a Caliph and his Governor from the capital city of Damascus during the plague and the entrance of an army commander into the city to take it over during the same plague. Here we have evidence that no rigorous quarantine was maintained. Indeed the historical data clearly states that the Caliph and his Governor fled the city due to the plague. This is in sharp contrast to the plague of Emmaus in the time of the Righteous Caliph Omar Ibn Al-Khattab. Omar's righteous governors Abu Ubaidah Ibn-Al-Jarrah and his deputy Muadh Ibn-Jabal all died in the plague as they obeyed the Islamic Law of quarantine in the time of the plague. Indeed Omar himself was stopped at the border and had to turn back after realising the Prophet's command that no one should enter or leave a city hit by plague. These laws appear completely ignored during the later era of the Ummayad dynasty.

What is even more worrying is that the historical chronicles do not have any data on the death toll in this particular plague or on the State response either during or after the plague. Comparing this with the rich data that we have regarding the plague of Emmaus more than a hundred years earlier raises a lot of questions. Were there no adequate State records? Had the records system so deteriorated that it was unreliable or almost non-existent that the medieval scholars simply did not have the information? Was there no State response at all either during or after the plague hence the scholars made no mention of it?

As previously mentioned, some of the scholars had documented that the new Caliph that entered Damascus with an army to take over the city during the plague may himself have died months later of the disease. Was the disease so rampant? Did the disease spread outside the Damascus? It is not clear the extent or even the virulence of this particular epidemic. Indeed unlike the plague of Emmaus where the actual symptoms of the disease have been meticulously recorded by the medieval scholars which have led modern day medicine to

place a diagnosis of bubonic plague, the symptoms of this epidemic have not been recorded in the major works consulted. Was it actually bubonic plague or some other epidemic that the scholars simply called plague using the term as a general expression for any form of epidemic? Whilst that is possible, it has to be noted that the Arabic terms for plague and epidemic are different. However, considering the lack of quarantine at the time and armies going in and out at will and the almost complete absence of State response, if this epidemic was due to bubonic plague, it would have been expected to spread well out of Greater Syria and would have caused a great number of deaths within the region. Even if there were no records of the actual death toll, the deaths would have been so high and the medieval historians would have most likely at least mentioned the huge death toll. It is therefore unlikely that the epidemic that hit Damascus in the later part of the Ummayad dynasty was bubonic plague.

However, the Government of the time may not have known the differences and quarantine by Islamic law should still have been applied both by the fleeing Caliph and the army commander. This clearly did not happen. In addition the lack of records of any State response is ominous that there may have been none.

The above incident fits with the general trend in the latter part of the Ummayad dynasty that there was clear deviation from some of the Islamic principles regarding the social determinants of health and the role of the State in applying a welfare system and its response to disasters.

This is in addition to the lack of peace would suggest a significant deterioration in the general health of the population at the time when compared to the earlier periods.

Results/Discussion

Chapter 6: The Abbasid Caliphate

Chapter 6

Section 1: The Abbasid Caliphate – Overview

In this chapter, the following topics will be covered:

1. An introduction to the Abbasid family – including a discussion of they were.
2. An overview of the system of government of the Abbasids
3. The Caliphs Harun Al-Rashid and Al-Ma'mun
4. The educated society that was encouraged in the Abbasid era

6.1.1 The Abbasid family:

The Abbasids were the descendants of the Prophet Muhammad's uncle Abbas Ibn-Abdel Mutalib. Towards the later end of the Ummayad Caliphate, the descendants of Abbas formed themselves into a powerful revolutionary group and had help from Muslims of the city of Khorasan in the former Persian Empire which had been annexed to the Caliphate of Islam in the era of the Righteous Four.

The Abbasids successful revolution against the Ummayad dynasty was based on several factors. The first was the Ummayad Government's lack of social justice in the later part of the era. Secondly, the Abbasid's proclamation that they were the descendants of the Prophet's family gave them a religious standing amongst the Muslims. Thirdly, the Abbasid's manifesto that all citizens would be treated equally according to Islam appealed to many who felt that the Ummayads treated them as second class citizens. Finally, the several uprisings that had occurred against the Ummayads further weakened the Ummayad clan (Bennison, 2009, pp 24).

6.1.2 The Abbasid revolution and rule:

In 748CE, the Abbasids had captured the garrison town of Kufa in present day Iraq and a year later they proclaimed Abul Abbas (also known as Al Saffah) as the Caliph. In 750CE, they defeated the last Ummayad army beside the River Zab which empties into the River Tigris (Bennison, 2009, pp 25). The last Ummayad Caliph Marwan was killed 6 months later. The Abbasids conducted a massacre of most of the Ummayad family members,

however a Ummayad prince by name of Abdelrahman escaped and made his way to Muslim Spain. There he set up an emirate completely independent of Abbasid rule which in the 10th century would establish itself as the Caliphate of Cordoba to rival the Abbasid caliphate. The first Caliph of Cordoba was called Abdelrahman III Al-Nasir (Khoury, 1996, pp 80 - 98).

The Abbasid move westwards stopped at North Africa and did not cross into the Iberian Peninsula. By 762CE, the Abbasids moved the capital to the newly founded city of Baghdad (the City of Peace) under the rule of the Caliph Abu Jaafar Al-Mansur (El-Hibri, 1999). The Caliph is said to have laid the first brick of the new city himself and about 100,000 workers built the city over the next four years at an estimated cost of 4,883,000 dirhams (Goodwin, 2003, pp 24 - 28).

The following decades saw a consolidation of power within the Caliphate in the hands of the Abbasid family. The next five centuries of the Abbasid Caliphate saw a multicultural and highly cosmopolitan society with the rise of science, philosophy, architecture and medicine. It is also during the early part of the Caliphate that Islamic scholarship started to rise and it is in this era that many of the historical chronicles in addition to the books of Hadith and jurisprudence were written. The explosion of literary work had the patronage of the Abbasid court and many of these writings have been preserved till this day and form the basis of any historical research on the era.

The writings on medicine also thrived and again many of the medical manuscripts written in that era have been preserved. The Abbasid era saw the development of what is called today “the Golden Age of Islam” (Falagas et al., 2006, pp 1581 - 1586). Almost every branch of knowledge was advanced in the Abbasid academies. The early Caliphs invited scientists, translators and thinkers into their court. The speed of development was facilitated by a massive improvement in the trade route system of the Abbasids (Bennison, 2009, pp 141 - 143).

The Abbasids continued with the foundations of the administrative structure set up by their Ummayad predecessors. However, there was an increased presence of the Persian system of bureaucracy in the civil service especially in the early period with the rise of the Barkamid family as viziers to the Abbasid Caliph (Goodwin, 2003, pp 24 - 28). The most celebrated Caliph of the Abbasid era was Harun Al-Rashid and this particular Caliph deserves some attention.

6.1.3 The Caliphate of Harun Al Rashid:

This most celebrated Abbasid Caliph is the protagonist of the medieval *"One thousand and one Nights"*. The splendour of the Caliph's court has been the subject of many historians fascinated by the Abbasid era. *"One thousand and one Nights"* is however a fiction and has no historical bearing with the actual life of Harun Al-Rashid. Harun became Caliph at the early age of 22 years. Harun initially favoured the Barmakid family and indeed appointed one of its members Yahya as his vizier (Kennedy, 2004, pp 141).

The night that Yahya was appointed by Harun was the night that Harun's predecessor Al-Hadi died. Al-Hadi had given orders for the execution of Yahya but died before Yahya was put to death. Harun ordered the release of Yahya and appointed him his vizier with extensive administrative powers. In the later part of Harun's rule, the Barmakids fell out of favour with the Caliph (Kennedy, 2004, pp 142).

Harun Al-Rashid invited Jibrail Bukhtyishu to come to Baghdad to head the first hospital to be built in the city under the direct auspices of the Caliph (Miller, 2006, pp 615 - 617). The hospital was to become the prototype of a chain of hospitals that were to spread all over the Abbasid lands. Harun Al-Rashid had started a court where scholars and scientists were welcomed and patronised. Libraries flourished in that era. The Caliph died at the age of 46 years in 809CE. The next Caliph was his son Al-Amin. However a war started between

Al-Amin and his brother Al-Ma'mun. Finally Al-Amin was assassinated and Al-Ma'mun became Caliph.

6.1.4 The Caliph Al-Ma'mun:

Al-Ma'mun continued the patronage given to scientists that was characteristic of the Abbasid court. Apart from an extremely controversial religious question issue which had caused a split within Muslim scholarship, where Al-Ma'mun sided with one group of religious scholars against the other, his reign saw the flowering of several scholarly works. He set up several astronomical observatories and initiated the famous "House of Wisdom" or "Baytul Hikma" in Baghdad (Mackensen, 1935, pp 114 - 125). This foremost academy had the best translators, scientists and philosophers from all over the State as its staff.

Al-Ma'mun's love for knowledge which resulted in the culmination of the House of Wisdom and the sending of emissaries to Byzantine lands asking for manuscripts and books of knowledge is related by the medieval scholar Ibn-Nadim whose famous catalogue of books of that era called the "*Kitab al-Fihrist*" is being used as a reliable index of the books of the time. Aristotle had appeared to the Caliph in a dream and told him that there was no conflict between reason and religion. The Caliph sent emissaries to the Byzantine Emperor asking for access to manuscripts and books that were stored in an old unused building. The Emperor initially refused but later allowed the ambassadors of the Caliph access to the building and its manuscripts (Nagamia, 2003, pp 19 – 30) to make copies. According to Ibn-Nadim there were about fifty seven translators associated with the House of Wisdom in Baghdad (Nagamia, 2003, pp 19 – 30).

Al-Ma'mun died in 833CE.

6.1.5 An Educated Society:

Successive Abbasid Caliphs would continue the patronage of scientists. The Hospital system grew massively and so did the libraries, the observatories and the academies. The

Golden Age of Islam fostered the production of many scientists and physicians and soon not only did the translation movement grow but original contributions were now added to the growing body of knowledge. The paper industry flourished in Baghdad and the number of books in circulation is beyond count. As an indication of the role of scholars, the modern scholar Amira Bennison has stated through her research that:

> "although it is very difficult to compare wages across 1,000 years, a good translator might receive 500 gold dinars, roughly equivalent to $24,000, per month for his labours, a princely sum which is a significant indicator for the appetite for translations among the early Abbasid elite and their respect for knowledge" (Bennison, 2009, pp 185).

Extensive libraries were attached to the hospitals built in the Abbasid era. The Tulun Hospital built in 872CE in Cairo had a library containing about 100,000 books; the Mustansiriyah University in Baghdad had 80,000 volumes; the main library in Cairo had 2,000,000 books whilst the library in Tripoli had 3,000,000 books (Miller, 2006, pp 615 - 617).

The next chapter looks at the translation movement and its main protagonists.

Chapter 6

Section 2: The Translation Movement in the Abbasid Caliphate

In this chapter, the following topics will be covered:

1. An introduction of the Golden Age of the Abbasid era
2. A summary of the Translation movement
3. A summary of the main translators of the Abbasid era

6.2.1 The Golden Age begins with the Translation movement:

The Caliphate of Islam had embraced several civilizations from it eastern to western borders. The multicultural society had the Persians, the Arabs, the Egyptians, the Indians and many parts of the former Byzantine Empire all under one administration.

As many historians have demonstrated, it was during the Abbasid Caliphate and under the patronage of the Abbasid rulers that medical advancements reached their peak. That is not to say that during the previous era, there were no advancements. We have already seen in the Ummayad dynasty for instance, the first hospital to be set up for the treatment of leprosy. However, whilst the health and social welfare system had been set up in the first two eras and was well established by the time the Abbasids came into power (with the exception of the later period of the Ummayad dynasty), it was the Abbasids who built on the system's foundations and advanced the medical sciences and indeed all other sciences.

From the point of view of medical and scientific advancements, the Abbasid era is known to most historians as the Golden Age of Islam. Under Abbasid patronage, scientific manuscripts in the provinces and beyond were brought in an integrated manner and scientists and men of knowledge were given special prominence in the State.

6.2.2 The Caliphs as Patrons:

The Translation of scientific and medical manuscripts from previous civilisations including the Greco- Roman, Indian, Persian and even Chinese civilisations formed the initial cornerstone of the growing interest in medical advancements.

Direct patronage from the highest level of authority in the Abbasid Caliphate – the Caliph himself – is seen to directly influence the translation movement. Al-Mansur – the second Caliph of the era – heavily sponsored the translation of scientific works. In the newly founded capital city of Baghdad, Al-Mansur commissioned the Nestorian Christians, Jurjis Ibn-Bukhtishu and Al-Bitriq to translate medical works (Pormann and Savage-Smith, 2007, pp 24). These Nestorian Christians were closely allied to the Persian school of Jundishipur that had been taken over by the Muslims in the era of the second Righteous Caliph Omar. The choice of these scientists by the Caliph himself showed a paradigm shift to use everything at the disposal of the Abbasids to promote medical science – a policy that would continue for the next two centuries. Furthermore, the Abbasids continued the policy of the early Ummayad Caliphate of promoting and patronising talent irrespective of religion and ethnicity.

6.2.3 Yuhanna Ibn-Masawayh: the beginning of the Abbasid Translation movement:

One of the very first major translators was Yuhanna Ibn-Masawayh (Mesue the Elder) who lived between 777CE – 855CE (Hamarneh, 1983, pp 130). With over 20 books and treatises dealing with the medical sciences, Yuhanna made a strong case to combat untrained and unqualified medical practitioners. His popular textbook "*Al-Nawadir al Tibiyyah*" was a compilation of medical terms and notes on the practice of applied medicine. Yuhanna wrote on drug therapy in his textbook titled "*Jawahir At Tibb Al-Mufradah*" (Hamarneh, 1983, pp 171).

Yuhanna appears to be the first person to produce a work on Ophthalmology in Arabic (*Dagal al Ayn*) albeit a "short and disorganised discourse" on the subject (Hamarneh, 1983, pp 171). Perhaps, Yuhanna's greatest achievement was the training of a rising scientist who would become the most prominent translator of the Abbasid era – Abu Zayd Hunayn Ibn-Ishaq Al-'Ibadi (d.874CE) popularly known as Hunayn Ibn-Ishaq

6.2.4 Hunayn Ibn-Ishaq:

Hunayn quickly became a leading scientist and medical translator of his time. The system of the time encouraged the likes of Hunayn to develop and flourish. His *"Ten treatises on the Eye"*, a well organised and extensive work on the diseases of the eye replaced his teacher's "disorganised treatise on the same subject (Hamarneh, 1983, pp 171).

Many scholars rank his compendium titled *"Medical questions and answers for students"* which he started during the era of the Caliph Al-Mutawakkil, as his most significant medical work. In that work, he writes of the balance of sickness and health in six definite terms: the surrounding air, food and drink, work and rest, wakefulness and sleep, vomiting and defecation, and the psychological state of the individual (Hamarneh, 1983, pp 172). The environment, availability of food and water and the inter-balance of work and rest which would usually denote the socio-economic status of the individual parallel some of the social determinants of health as advised by the Ottawa Charter of the WHO as previously discussed.

It is possible that the Caliphate with its social welfare state and health promotion system that had been in place since the time of the Righteous Four would have defined the thinking of the early scientists and physicians to recognise the impact of the social welfare on health and hence it appears early in their works.

Hunayn also wrote treatises on pharmaceuticals and the use of simple drugs and compound drugs. He set standards on drug potency, pharmacodynamics and pharmacokinetics in addition to drug dosing (Hamarneh, 1983, pp 173). Public health was as important to Hunayn as medical interventions again indicating that scientists of the time had understood the difference between the medical delivery system and public health. In a treatise *"Ailments of the stomach"*, Hunayn emphasised the importance of hygiene and sanitation. A further emphasis on hygiene was seen in one of his books specifically dedicated to oral and dental hygiene known as *"Dental preservation and improvement"* (Hamarneh, 1983, pp 174).

One can again see that Hunayn's work is very much linked to the preventive measures of public health that were predominant in the era of the Righteous Four and that the scientist was now using a different methodology – that of scientific experimentation and observation - to emphasise the health promotional activities of previous eras.

Hunayn and his associates translated some 129 works of the great Greco-Roman physician Galen (Pormann and Savage-Smith, 2007, pp 25). His associates included close relatives. His son Ishaq Ibn-Hunayn and his nephew Hubaysh Ibn-Al-A'sam were active in his translation department and continued after his death (Pormann and Savage-Smith, 2007, pp 25). On some occasions especially in the translation of some of Galen's work, Hunayn complained on the rarity and inaccuracy of some of the manuscripts at his disposal and seems to attempt to use a triangulation of sources to reach the maximum accuracy of the information needed (Pormann and Savage-Smith, 2007, pp 25).

Hunayn himself worked for several prominent physicians of his time. Bukhtishu Ibn-Jibril was his patron as well and this particular doctor was the personal physician to three Abbasid Caliphs – Al-Mamun, Al-Wasiq and Al-Mutawakkil. The presence of the House of Wisdom in Baghdad undoubtedly enhanced the work of these learned men.

6.2.5 Eastern Translations:

Other forms of medical texts including Chinese and Indian medical compendiums were also translated into Arabic. Examples of such works include Caraka's compendium, Susrata's textbook (an Indian textbook regarded as one of the oldest medical textbooks in the world) and Vagbhata's "*Textbook of Medicine"* (Pormann and Savage-Smith, 2007, pp 22). Some of these works were translated into Persian and then the Persian text translated into Arabic. Such was the case with Caraka's compendium that was translated into Arabic from its Persian version by Abd Allah ibn Ali. The effect on the accuracy of the final rendition into Arabic via a translated version is not clear (Pormann and Savage-Smith, 2007, pp 36).

Even as far as Uzbekistan, translations were to continue as well. A prominent scientist, Abu Raihan Muhammad Ibn-Ahmad Al-Biruni (973CE – 1048CE) rose to become one of the most renowned scholars in the scientific world. Trained by the well-known astronomer Abu Nasr Mansur, Al-Biruni's expertise spanned from mathematics to pharmacology. His major contribution to the field of medicine was his popular book *"Kitab al-Saidana"* which combined medical knowledge in the Arabic language with Indian medications thus again expanding and unifying medical knowledge from several cultures (Khan, 2008, pp 76). The National Aeronautics and Space Association (NASA) honoured the works of this scientist by naming a crater on the Moon after him – Crater Al-Biruni (Khan, 2008, pp 77).

The cosmopolitan environment that the Abbasid Caliphate encouraged in addition to the vast Empire with several cultural diversities brought for the first time in that era, the works of the scientists from East and West into one unified language – Arabic. The transmission of knowledge was quick in addition to the build-up of information and the subsequent improvement and advances.

Al-Jahiz (781 – 869CE) – an early product of the Abbasid scientific programme elegantly summarised the perceptions of the scientists of the translation movement in his popular book "*The Book of Animals*":

"The works of the Indians are rendered into Arabic, the Wisdom of the Greeks is translated and the literature of the Persians has been transferred. As a result some works have increased in beauty, while others have remained unchanged. If one were to transpose the wisdom of the Arabs (into another tongue), however, then the wonderful splendour of the metre would be lost and those attempting to do so would not comprehend the meaning. For this reason, non-Arabs do not mention it (Arabic Poetry) in their works, which they (the non-Arabs) composed for their livelihood, intelligence and wisdom. These (foreign) books were transmitted from nation to nation, from century to century and from language to language,

until they ended up in our possession. We are the last to inherit and study them. It is true that these books are more successful in recording the achievements (of past generations) than monuments and poetry".

6.2.6 Products of the Translation movement:

With the massive efforts of translation, medical advancements started to occur within the Abbasid caliphate. Physicians built on the existing integrated knowledge and soon the Abbasids started to build hospitals in almost every single city under their rule. The Abbasid hospitals have been celebrated by many historians and some of these colossal buildings are still standing till this day.

The hospitals and academies were to produce the great physicians that contributed so much to the development of medicine and set the foundations of the European Renaissance from a medical perspective. The works of many of these physicians were used as medical textbooks in Europe for centuries and many underwent several editions.

It has to be emphasised here that these physicians were the product of a system that produced the hospitals and the academies and the appropriate environment for further development patronised by the rulers of the time.

The next chapter will look at the hospital system.

Chapter 6

Section 3: The Abbasid Caliphate: Hospital System

In this chapter, the following topics will be covered:

1. An overview of the hospital system in the Caliphate
2. A discussion of the major hospitals built in the provinces
3. A discussion on the funding systems of these hospitals
4. Medical licensing in the Caliphate
5. A comparison of the hospital management with the contemporary English National Health Service.

6.3.1 Introduction:

As previously mentioned in the Ummayad section, the era of the Ummayad Caliph Al-Walid showed the first hospitals in the Caliphate in the form of the Leprosariums. These hospitals were called Bimaristans (singular – Bimaristan) which is a Persian word meaning "place for the sick". This word continued to be used throughout the Islamic era as the name given to the hospitals that would later spring up throughout the region. These Bimaristans were secular in nature as they depended on known scientific treatments of the time (Abouleish, 1993, pp 19). Witch craft had no place in the Bimaristans of Islam as the mere concept of magic was forbidden in Islam. Magic may have been practiced in the region but certainly not at Government institutions that represented the Islamic State.

The hospitals in the Islamic Caliphate were classified as "Waqf" (Abouleish, 1993, pp 21). This literally means "Trust". This meant that funding could come from charity money in addition to the Government spending. "Trusts" in Islam could also be donated by wealthy individuals to be used by the public through the State. Mosques and schools were also classified as "Trusts".

The early Abbasid hospitals appear to have taken on the medical traditions practiced at the Persian city of Jundishapur that fell to Muslim armies in 639CE during the Caliphate of the second Righteous caliph Omar Ibn Al-Khattab.

6.3.2 The Jundishapur School:

To further understand the early hospital administrations in the Islamic Caliphate, this section will look at the influential school of Jundishapur. The personal physicians of the early Abbasid Caliphs all graduated from this school. This city and its academy appear to have been the most notable in medicine during the Sasanian Dynasty (226 – 652CE) (Modanlou, 2011, pp 236 - 239).

The city was initially founded by Persian ruler Shapur I. Later an academy, a teaching hospital attached to a University with a library said to contain 400,000 books were founded in the city in the 4th century AD. The academic culture in Jundishipur was cosmopolitan in nature combining Indian and Greek medical sciences and manuscripts which were translated. It was here that the Nestorian Christian Bukhtishu would become the Dean of the medical school and Director of its teaching hospital (Modanlou, 2011, pp 236 - 239). The head of this school and its physicians appear to have been presented in front of the Persian King Chosroes II in a symposium (Wieserhofer, cited by (Modanlou, 2011, pp 236 - 239). Chosroes II was a contemporary of the Prophet Muhammad and it was his successor that the Prophet of Islam had written to inviting him to Islam. The new king tore the message of the Prophet of Islam in arrogance (Al-Mubarakpuri, 2002, pp 418).

It was in Jundishapur that medical education was undertaken in a very similar way as we have it today. Medical students were trained in a teaching hospital by several specialists and there is evidence that they were examined before certification (Modanlou, 2011, 236 - 239). When the Muslims finally took the city in 638 – 639 CE, the academy and hospital were

preserved. The Bukhtishu family continued to head the school. In 765 CE, Jurjis Ibn-Bukhtishu was asked by the Caliph Abu Jaafar Al-Mansur to come to Baghdad (Shanks and Al-Kalai, 1984, pp 60). The traditions of that school were then slowly transferred to the new Islamic Capital. However the school's pre-eminence declined with the death of the last director of its hospital Sabur Ibn-Sahl in 869 CE (Azizi, 2008, pp 116 - 119). Al-Mansur's successor, the celebrated Caliph Harun Al-Rashid commissioned the son of Jurjis, Jibrail Ibn-Bukhtishu to build the first Bimaristan in Baghdad (Shanks and Al-Kalai, 1984, pp 60).

The school's products thus headed the first wave of hospitals in the Abbasid Caliphate and brought with them the traditions of this renowned ancient centre which went a long way in influencing the administration and practice of the early hospitals in the caliphate. It is important to note that the hospitals in the Islamic Caliphate were secular hospitals. They were not run by clerics or religious authorities. They were scientific institutions that used the knowledge available at the time (Abouleish, 1993, pp 19).

6.3.3 The Hospitals in the Abbasid era:

Historically we have several named hospitals in the Abbasid era. These were large institutions that also served as learning centres. They were by no means the only hospitals in the Caliphate. It is known for instance that the Caliph Abu Jaafar Al-Mansur after appointing the dean of the medical academy in Jundishipur (Jurjis Ibn-Bukhtishu) as his Court Physician, Jurjis was ordered to build more hospitals especially within the capital city of Baghdad (Abouleish, 1993, pp 22).

6.3.3i Iraq and the Baghdad Hospitals:

The first major hospital was built under the instructions of the Caliph Harun Al Rasheed. The hospital was simply known as the "Baghdad Bimaristan" and was built under the supervision of his Court Physician Jibril himself the grandson of Jurjis (Hamarneh, 1983, pp 98). A second hospital was built under the auspices of the rich and powerful Barkamid family

who were senior Ministers in Harun Al-Rahid's Government. However, it seems this second hospital ceased to operate after the family fell out of favour with the Caliph in 803 CE (Hamarneh, 1983, pp 98). On the other hand "Baghdad Bimaristan" had the renowned physician Yuhanna Ibn-Masawayh as its chief Physician himself recruited by Jurjis.

Another of these hospitals was built under the auspices of one of the Caliphate's top physicians – the well-known Abu Bakr Muhammad Ibn-Zakariya Al-Razi well known in the West by his Latinised name Rhazes. Al-Razi was a physician in Ray in Iraq and headed a hospital there (Hamarneh, 1983, pp 98). A major hospital was to be commissioned in Baghdad and the authorities looked for a prominent physician to lead the project. Al-Razi was chosen out of 100 applicants. Commissioned by the Caliph, the physician sought to look for the most appropriate place for the new hospital. He hung pieces of meat in places around the city. The place where the meat stayed longest before decaying meant, for the physician, that the air was purest at that place and there he chose as the site of the new hospital (Abouleish, 1993, pp 50). The hospital that was built finally became known as the famous Muqtadiri Hospital (Al-Ghazal and Tekko, 2003, pp 9 - 11). It was named after the Caliph Al-Muqtadir who in 918CE built this hospital and another hospital on the East side of the city and named it Al – Sayyidah hospital after his mother (Abouleish, 1993, pp 22). Al-Sayyidah Hospital was endowed with 600 dinars a month - a large amount of money at the time (Hamarneh, 1983, pp 98).

Al-Adudi hospital is another celebrated institution in Baghdad build in 981 CE by the ruler Adud al-Dawlah. This hospital boasted of the best of medicine at the time with 24 different specialists running the clinical aspect of the hospital (Abouleish, 1993, pp 23). In 1068 CE, a flood from the Tigris River partly destroyed the hospital. The State immediately remodelled the whole building and services for patients were improved and the number of specialists was increased to 28. The renowned physician in the 12th century Hibatullah Ibn-

Attimidh headed this hospital (Hamarneh, 1983, pp 99). However, the well-known traveller Ibn-Jubayr commented in 1185CE that whilst the hospital was a magnificent structure, there was a lack of adequate attention to the sick as the doctors only visited the wards twice a week (Hamarneh, 1983, pp 99).

6.3.3ii Mecca and Medina:

These two cities held special importance in the Islamic Caliphate due to their religious importance. Mecca was and still is the site of pilgrimage for all Muslims – pilgrimage being the fifth pillar of Islam. The mosque of the Prophet Muhammad is sited in the city of Medina and many pilgrims would visit the Mosque before or after the pilgrimage rites in Mecca. It was important than health services were available in these cities. Historical records show that hospitals did exist in these cities and health care available on the pilgrim routes (NLM, 2011).

It is also known that during the reign of the Caliph Al-Muqtadir (who built the Muqtadiri hospital and the Al-Sayyida Hospital above), the Caliph ordered the renowned physician Abu Uthman Said Ibn-Yaqoub of Damascus to supervise the hospitals in Mecca and Medina (Hamarneh, 1983, pp 98). This historical data suggests that these hospitals were indeed in existence.

6.3.3iii Egypt:

In 872 CE, the Abbasid governor of Egypt Ahmad Ibn-Tulun built a hospital in Al-Fustat city in the south-western quarter of present-day Cairo. It was called then Al-Fustat Hospital (Abouleish, 1993, pp 23). Care for the insane was provided in this institution (NLM, 2011). The hospital had separate wards and patient valuables were stored safely until discharge from the hospital. On discharge patients were given 5 gold pieces to help them look after themselves in their recuperation phase (Syed, 1993, pp 49). The cost of this hospital is

reported to be 60,000 dinars and the Governor paid special attention to this institution and visited the sick every Friday after the congregational prayers (Alam and Siddiqui, 2007, pp 3).

The Library of this hospital is said to have had 100,000 books (Haddad, 1973, pp 331 - 346). This suggests that the institution not only served as a hospital but as a teaching academy of medicine as well. The popular Sultan of Egypt Saladin who defeated the Crusaders build another hospital in Cairo known as the Nasiri hospital in the 12th century (NLM, 2011) and also built a hospital in Alexandria.

6.3.3iv Syria:

The Sultan Nur Al-Din Zengi built Al Nuri Hospital in Damascus in 1156 CE (Abouleish, 1993, pp 22). It was an era of war with the Crusaders and the hospital was to function not only as a major institution but also as a medical school with medical records in place. The Sultan provided funds for a rich medical library and it is known that the prominent medieval physician Ibn Nafis graduated from this institution (Abouleish, 1993, pp 22).

The Sultan appointed a renowned physician Abu Al-Majid Al-Bahili as the hospital's first medical director (Hamarneh, 1983, pp 100). In 1185CE, the traveller Ibn-Jubayr wrote on the "admirable way" in which the hospital kept medical records for each patient including the medications that were prescribed. Other directors for this hospital are recorded with another renowned physician Muhadhib Al-Din Ibn-Al-Naqqash (d. 1178) who also served as Chief Physician to the Sultan. His son Najm Al-Din also served in the same hospital. Meyerhof regarded that the founding of these hospitals in the Caliphate of Islam were the greatest contribution to Medicine from the Muslim world (Hamarneh, 1983, pp 100).

In 1049CE, the Christian Physician Ibn-Butlan left Baghdad and travelled through Egypt and finally settled in Antioch and is presumed to have headed the hospital there that was initially under the directorship of the Archbishop. Ibn-Butlan was a well- trained physician and other historians including the medieval Ibn-Abu Usaybah report that the renowned physician did direct the hospital in Antioch (Hamarneh, 1983, pp 100).

6.3.3v Jerusalem:

By 1055CE the Crusaders built St John's Hospital which catered for the Knights and the pilgrims. Its location is in present day Dabbaghah and it was set by the Order of the Hospitalliers of St John using aid from the traders of Amalfi. With Saladin's victory in 1187CE, the Sultan expanded the hospital's services and appointed the well renowned physician Yaqub Saqlab Al-Nasrani as head of the institution. Saladin also changed the name of the hospital into Salihani Hospital. It is said to have continued to function till 1458CE when it was destroyed by an earthquake (Hamarneh, 1983, pp 101).

This hospital appears to be the first effect that the Caliphate may have had on medieval Europe which at the time did not have the medical services that the Islamic State enjoyed. St John's hospital was built in the same style and administration as the Bimaristans. It is clear however that it did need further improvement as the services were expanded by Saladin.

6.3.3vi Tunisia:

The Al-Qayrawan Hospital was built in 830CE under the auspices of Prince Ziyadat Allah in the Al-Dimnah in Qayrawan City. It apparently was the main hospital built in the city as all subsequent hospitals in Tunisia were called Dimnah rather than Bimaristan as they were known in the Eastern region of the Caliphate (Abouleish, 1993, pp 23). Near Al-

Dimnah hospital there was a separate building known as Dar al Judhama or "House of the lepers" where lepers received medical care (Hamarneh, 1983, pp 102).

The Qayrawan hospital was reported as having large separate wards with reception rooms for patients and visitors. One striking feature of this hospital was the present of female nurses from Sudan and a mosque for prayers. The hospitals in Tunisia are known to have been well supported by the State, philanthropists and rulers who gave large sums of money so that the best medical care was provided for the patients (Hamarneh, 1983, pp 103).

6.3.3vii Morocco:

The ruler Al-Mansur Yaqoub Ibn-Yusuf built the Marakesh Hospital in 1191CE. It was a massive infrastructure with water carried to all its sections via specially made aqueducts and patients were supplied with clothes depending on the season of the year. According to the historian Al-Marrakushi who witnessed the construction of this institution, it was surrounded by "fruit trees, flowers, herbs and vegetables" (Hamarneh, 1983, pp 103).This hospital had a feature different from most hospitals that we have information about – a specially designed private wing that charged patients for their treatment. It had a pharmacy that was under the control of specialists called Sayadlah (Abouleish, 1993, pp 24). This term is used till this day to refer to pharmacists.

6.3.4 Structure of the Hospitals built in the Caliphate:

It is difficult to generalise the structures of these institutions but evidence shows some certain common basic components were present in the hospitals built in the Eastern and Western part of the Caliphate.

6.3.4i Architecture:

The major institutions were massive. Hospitals in Syria and Egypt seemed to have a common architectural plan (NLM, 2011). They were built on a "cruciform" plan with four central main halls with several adjacent departments including catering areas, pharmacy, staff accommodation and in some of them a library. Some hospitals provided housing for students (Syed, 1993, pp 48; Abouleish, 1979, pp 28 - 45).

Main halls were supplied with fountains that provided a continuous supply of clean water. Men and women were put in several halls. These halls were subdivided into wards depending on the disease conditions (Syed, 1993, pp 48). Known wards include:

1. Eye ailments
2. Gastrointestinal ward (dysentery and diarrhoea included)
3. Fevers
4. Surgical wards
5. Mentally ill
6. Rheumatics

In addition there were outpatient clinics and a free pharmacy providing medications (NLM, 2011). The fever wards had special fountains that cooled the air and night music was played in the wards for the mentally ill to soothe the patients.

In addition many hospitals served as Teaching Hospitals and had teaching facilities including lecture rooms. The Adudi hospital in Baghdad was known to have teaching facilities but the exact number of hospitals that had formal teaching is unknown. However clinical training at bedside was encouraged in most hospitals as is written in several manuscripts including the encyclopaedia of al Majusi (NLM, 2011).

The architectural plans of the large hospitals would suggest that these were famous teaching hospitals that produced not only medical doctors but also specialists. The smaller hospitals that had no formal teaching practices but encouraged clinical bedside training would be similar to today's District General hospitals that we see within the modern UK.

6.3.4ii Mobile Hospitals:

These were a feature of the Caliphate. Mobile hospitals relied on beasts of burden to transport staff and equipment to remote and disadvantaged areas. In addition they accompanied the armies and were used in attending to prisoners (Syed, 1993, pp 49 - 50). Caliphs had ordered their ministers to construct these mobile hospitals to be able to provide care to people in areas where the standard hospitals could not be built as a show of their philanthropy and care to these areas.

The mobile hospitals (or clinics) would stay in the areas for a few days and sicker patients were transported to the main hospitals within the cities. The physicians that went with these mobile hospitals were no less prominent than those in the main hospitals. Indeed Andrew Miller's description of these mobile hospitals is sufficient:

"The physicians in the mobile clinics were of the same standing as those in fixed hospitals, and the field hospitals were well equipped with medicaments, instruments, tents, and a staff of doctors, nurses and orderlies. These mobile bimaristans allowed state services to reach the disabled, the disadvantaged, and those in remote areas. By the reign of the Seljuq Turkish Sultan Muhammad Saljuqi, the mobile bimaristan had become so extensive that its equipment needed forty camels to transport it" (Miller, 2006, pp 615 - 617).

6.3.5 Hospital Staff:

The Bimaristans were usually well staffed. These staff received salaries from the State. Depending on the size of the hospital, the staff varied in both numbers and specialties. The Adudi Hospital already described had 24 specialists at its inception since it was regarded as the main teaching hospital of the region. However, there appears to be a standard set of staff for the Bimaristans and this standard is discussed here.

6.3.5i The Hospital Administrator:

This in many cases was a non – medical person. It was usually a political position and was a very lucrative post (NLM, 2011). The ruler of the region appointed this person or in some cases with major hospitals in Baghdad, the appointment was made by the Caliph himself (Hamarneh, 1983, pp 98).

6.3.5ii The Chief Physician:

This was usually a medically trained person and he controlled the clinical aspects of the hospital (NLM, 2011). In the larger hospitals, these were usually the prominent physicians of the time. Previously it has been shown how Razes the prominent physician was appointed to head the major hospital in Baghdad. Indeed it appears that there was a step ladder process in place for the appointment of the chief physician if the case of Razes was generalised. He had headed a smaller hospital in his native town of Ray prior to heading the Baghdad hospital showing a career progression.

The chief physician was not only a renowned medical doctor but must have also been a trained manager and provided leadership to the medical staff. This is derived from the historical data that many of these large medical institutions were indeed very successful and

patient satisfaction in many of them was quite high. As modern health care management has shown, this is not only dependent on the excellence of the skills of the doctors but on the leadership and managerial skills of those running the institution.

6.3.5iii Physicians:

These were the medical doctors who attended to the sick. As the system evolved they subspecialised as was seen in the Adudi hospital that had about 24 different specialists including oculists. Physicians in many instances followed a rota system and a roster was devised to make sure patients were seen and their medications prescribed accordingly (NLM, 2011).

6.3.5iv Pharmacists and nurses:

As previously discussed, these dispensed the medications both on an outpatient and in-patient basis. They inspected drugs and maintained quality control over the drugs that were dispensed. They used weights and measures to accurately dispense the medications. They seem to be more significant in hospitals west of the Caliphate especially Morocco (Hamarneh, 1983, pp 103).

As seen in the hospital in Marakesh, nurses were employed in the hospitals of the Caliphate. Again the use of female nurses has been highlighted.

6.3.5v Non- medical staff:

These included stewards, cooks, orderlies and attendants (male and female) that looked after the basic needs of the patients (NLM, 2011). The Department of Medical records had its own administrative staff especially in the hospitals of Tunisia.

The Department of Finance was an extremely important Department that not only looked after the costs of the hospital but also the dispensation of funds to discharged patients as was the case in some of the hospitals. The running costs of these institutions were huge and needed a full team of administrative staff to ensure the adequate appropriation of funds. This will be discussed in detail on the finances of the hospital system.

6.3.5vi The Regional supervisor or Muhtasib:

This role was usually given to a very senior physician. His office was that of regulation including complaints from the public with regards to patient care either from the hospitals or from specific doctors. The Muhtasib was empowered to conduct investigations and to recommend to the State the outcomes of these investigations. The outcomes could entail punishment of practitioners or fines to be paid to the patient or their relatives. In later times, licensing of doctors was added to the role of the Mutasib (Miller, 2006, pp 615 - 617).

6.3.6 State Licensing of doctors:

This appears to be the first historical account of licensing of doctors by the State in medieval times. In 931CE, the Caliph Al Muqtadir heard that a patient had died due to the error of a physician. He instructed the Chief Muhtasib of the Caliphate, Sinan Ibn Thabit, to start the process of licensing of doctors. Sinan organised examinations for almost eight hundred and sixty doctors in Baghdad alone (Alam and Siddiqui, 2007, pp 3). In some reports, sixty failed their exams (Miller, 2006, pp 615 - 617).

The process was extended throughout the provinces. Ophthalmologists in particular had separate exams and were not allowed to practise if they failed on the anatomy of the eyeball (Alam and Siddiqui, 2007, pp 3). The similarities with modern day licensing are striking. In many countries in the Western world, exams are necessary before doctors trained

overseas are allowed to practice. In the UK for instance, the General Medical Council, which functions in a very similar manner to the Muhtasib, licences doctors from overseas through an examination process (GMC, 2013).

6.3.7 Hospital Funding:

Hospitals were funded using a dual funding system. All hospitals were designated as Waqf institutions. As previously described Waqf means "trusts". This system permitted wealthy individuals to donate property and businesses to the hospital funding scheme. Not only the value of the business is in the ownership of the hospital but the actual profits of the business would go to the hospital. The properties could consist of "shops, mills, caravanserais, or even entire villages. The income from an endowment would pay for the maintenance and running costs of the hospital, and sometimes would supply a small stipend to the patient upon dismissal" (NLM, 2011).

The other source was State funded. The hospital's budget was assessed by Inspectors and a calculation is made on how much the Waqf system would provide. The remainder was provided by the State (NLM, 2011).

Thus public hospitals provided "free medical services to all regardless of age, sex, or social status" (Hamarneh, 1983, pp 106). However, the wealthy often preferred to go to private health institutions or clinics which were also available within the Caliphate. They preferred to go directly to specific doctors for consultation and paid the fee as necessary. This made the public hospitals more accessible to the poor and the needy and as these hospitals were usually well financed especially during the peak of the Islamic Caliphate, the patients enjoyed a good quality medical care within the limits of medical knowledge that was available at that time (Hamarneh, 1983, pp 106).

6.3.8 Modern comparisons with the English National Health Service:

There are clear similarities in the above historical narrative with modern day hospital systems in Western nations especially within the European continent where a social democratic system of health care exists in many nations. The public hospitals in the Islamic caliphate were clearly free at point of service. Many similarities can be seen with the English National Health Service (NHS). The similarities will be discussed as the system in the caliphate appears to be closest to the English NHS.

The National Health Service in England is one of the four publicly funded health systems in the UK. It was founded in 1948 following the 1946 NHS Act which established it by law. It was established by the then Labour Government. This was part of its political manifesto in the 1945 elections that was based on the historically known Beveridge Report of 1942 (Beveridge, 1942) that recommended a system of health care based on prevention and cure of diseases. Lord William Beveridge was a social scientist that was commissioned by the Government of the time to map out the strategic vision of welfare for post-World War II Britain. This report identified five giants that had to be tackled in the reconstruction phase: want, disease, squalor, ignorance and idleness.

Following World War II, despite Britain coming out almost bankrupt, it was decided that the National Health Service will be "free at the point of service". This became the hallmark of the service: it was designed to be funded through public taxation and national insurance. It was to provide high quality care to patients free of charge with the exception of a few stated procedures within the dental specialty. It will also provide training to doctors, nurses and health care professionals and managers in order to achieve these objectives.

Over the last 6 decades the NHS has evolved tremendously but still maintains its initial objectives of providing medical care and preventive therapies free of charge. In time the

National Health Service would become one of the largest employers of the world with over 1.7 million employees and in 2012/2013 had a budget of 156 billion US dollars (NHS, 2012) making it one of the largest health systems on the planet. The principles of the NHS remain as they were 60 years ago when the then Minister of Health Anuerin Bevan outlined them (NHS, 2011a):

1. It would meet the requirements of everyone
2. Free at the point of service
3. It would be based on medical need and not the ability to pay.

As detailed above, the Bevan principles are very similar to those of the medieval hospitals of the Caliphate. Furthermore, it is clear from the hospital narrative, that individual rulers in several provinces built and funded hospitals for their local population. This concept of provincial/local funding with hospitals being run by locally appointed directors meant that the central Government in Baghdad did not directly control the hospital services but decentralised such administration to local or provincial authorities. Thus it is clear that hospitals in Tunisia or Egypt or Morocco were not directly run from the central Baghdad authorities.

Such decentralisation of hospital services has only become implemented in the English National Health Service in 2004 with the creation of Foundation Trusts. These were NHS trusts (Trusts are the names given to hospitals in the NHS) that were going to be completely free of central government control. Ordinary NHS Trusts could gain foundation trust status if they can show significant community involvement in the strategic planning of their organisation by having a board of governors that came from the local communities. It empowered communities to make decisions on what kind of medical care they wanted free from the bureaucracy of central government (Exworthy et al., 2011, pp 232 - 237). In addition, foundation trusts could raise money from both public and private enterprise thereby

reducing the financial pressures on central government. Foundation trusts were regulated by a non-governmental independent group known in the UK as Monitor (Monitor, 2010a).

It is clear that the rulers of the provinces and the wealthy within the Caliphate built and sponsored these hospitals for the local population. The reason would not only be due to religious inclinations of the rulers but also as a show of their philanthropy and care to the people they ruled. This would in turn have increased the people's loyalty and respect for the rulers - an important factor in maintaining rulers' hold on power. From the hospital perspective, it meant that rulers had to recruit the best of medical and administrative staff that was available in order to provide the care that was needed by the population within their domains. This may have involved a health needs assessment procedure. Whilst many of the writings of the medieval doctors do show an inclination towards health needs of the population, this research has not been able to discern from the historical narrative a formal health needs assessment process except as was commanded by some of the Abbasid rulers with regards to prison hospitals as previously described with regards to the use of the mobile hospitals. However, it is not unreasonable to conclude that the hospitals built in the provinces and run by local authorities would have provided for the specific needs of their population.

It is also interesting that right from the outset of the hospital system in the Islamic Caliphate, the authorities differentiated the administrative management of the hospital from its medical management. It is clear from the historical narrative that as the hospital system evolved, heads of administration were non-medical personnel leaving the clinical aspect of the hospital under the medical doctors' control. This administrative director who was not necessarily a medical doctor was mostly a political appointment.

Such an advanced understanding of hospital management is seen in today's English National Health Service where many of the Chief Executives and Board Chairs of NHS

Trusts or Foundation Trusts are not medical doctors. However every NHS Hospital has a medical director. The resemblance in managerial structure is striking. It appears that the two streams of administrative management and clinical management in the Caliphate's hospitals worked distinctly with each other but with appropriate communication levels especially in the later celebrated large municipal hospitals that not only attracted patients but also the most talented doctors. These two distinct streams are present within the English NHS but after 1995, following the Banks Report, these structures were merged to provide more efficiency (Sheard, 2008). However, according to many, this merger caused a loss of morale in many sectors of the health service as medical staff took on administrative duties in certain areas and lost control over clinical areas to non-medical managers (Sheard, 2008). There is no record of a similar initiative in the Caliphate's hospitals.

The late 90s showed the Blair Government change the NHS management into the New Public Management practice which involved "star ratings" and a push for performance indicators and changing the public health sector into a competitive marketing sphere (Chang, 2009, pp 145 - 165). This did get efficiency into the system with hospitals battling to get patient waiting times lower to achieve the required ratings. However, health care is different from profit making institutions and cannot be assessed with a strict "number system" or with such strict performance indicators (Chang, 2009, pp 145 - 165). The push with "star ratings" gave administrative managers a lot of powers which occasionally went against the clinicians in order to achieve targets.

This was clearly seen in the recent UK major health scandal at the Midstaffordshire NHS Trust where over a thousand patients were thought to have died due to negligent behaviour. A major independent inquiry was set up to investigate which took almost 4 years. In February 2013, the inquiry produced its final report known as the Francis Report (Francis, 2013). One of the main findings of the report was that top administrative management were more

interested in achieving the targets (efficiency measurements) at the expense of patient safety (quality of care). We do not have historical records of such major scandals where the administrative and clinical management streams in the Caliphate's hospitals led to such disasters. However, the absence of such records does not mean they were absent. We do however have incidents of medical malpractices which stimulated legislation in the Caliphate and the actions of 931CE with regards to physician licensing have been discussed.

Chapter 6

Section 4: Decline and Final collapse of the Abbasid Caliphate

In this chapter, the following topics will be covered:

1. The causes of the decline of the Caliphate
2. The internal and external wars of the Caliphate and their effect on public health
3. The final collapse of the Caliphate and the aftermath

6.4.1 The fragmentation of the Caliphate:

Towards the end of the 9th century, the power of the Abbasid Caliph in Baghdad diminished. The powerful Caliph Harun Al-Rashid had started a process of decentralisation after the fall of the Barmakides allowing some form of autonomy to the different provinces provided the allegiance to the central capital remained and funds were sent to Baghdad (Kennedy, 2004, pp 144 - 145). This system worked well but by the end of the 9th century, provinces were almost completely autonomous and the Caliph became more or less a ceremonial religious figure.

The powerful governors of the provinces sought to consolidate their power and their dynasties further fracturing the caliphate. This led to several uprisings for the next three centuries that further weakened the Caliphate and several breakaway dynasties announced their independence from the central Baghdad government. Religious groups and sects also sought to consolidate their power and to form their own dynasties.

External invasion became imminent and by the 11th century, the Crusaders crossed into the Caliphate and launched several wars which culminated in the fall of Jerusalem into the hands of the Crusader armies. The Crusaders would stay in Jerusalem for almost a century.

6.4.2 The Fatimid Rebellion:

The Fatimids belonged to the Shia religious sect and claimed descent from Fatima, the daughter of the Prophet Muhammad and wife of the fourth Righteous Caliph Ali. Their claim

to the Caliphate was based on the direct lineage to the Prophet of Islam. Fatimid rebellion started in North Africa west of the Islamic Caliphate.

Fatimid forces soon controlled several parts North Africa and soon conquered Egypt and created the capital Cairo (Kennedy, 2004, pp 317). The Fatimids established a parallel Caliphate and at one point there were three Caliphs in the Muslim world – the Abbasid Caliph in Baghdad, the Fatimid Caliph in Cairo and the Andalusian Caliph in Cordoba. The Fatimids at their peak controlled North Africa, the Arabian Peninsula and even Sicily at some point came under their control. The Fatimid State ruled from 909CE till 1171CE when the well – known General Saladin deposed the last Fatimid ruler and returned the lands of the Fatimid State back under the nominal rule of the Abbasid caliphate (Hindley, 2007, pp 65).

6.4.3 The Crusaders:

In 1095CE, Pope Urban II declared the first crusade under his leadership in Clermont. Four years later, on the 15th of July 1099CE, the Crusaders entered the city of Jerusalem (Riley-Smith, 1998, pp 1095 - 1131) and a massacre of the Muslims and Jews in the city began. The shock of losing Islam's third holiest city resounded within the Muslim world but no real effort was made to recover the lost lands. The Crusaders would stay in Jerusalem for almost a century. During this period, the Crusaders came into direct contact with the developed culture of the Caliphate and indeed set up a hospital in Jerusalem – St John's Hospital which has been previously described.

The Kingdom of Jerusalem was established alongside other kingdoms in the region. The Crusader Knights however not infrequently fought against themselves which probably helped stop their advance further into Muslim lands. The Seljuk Turks who had set themselves up as a dynasty within the Abbasid Caliphate had attempted to stop the Crusader onslaught. An initial victory in 1099CE defeated the Crusaders in Anatolia and the following year the Seljuk Danishmand defeated a Crusader army near Malaita (Al-Djazairi, 2007).

However internal Muslim conflicts caused a major obstacle to the resistance against the Crusaders in much the same way the internal conflicts between the Crusaders caused an obstacle to their further advance (Al-Djazairi, 2007). It would take almost a century before the Muslim forces would regain the holy city under the leadership of Saladin.

6.4.4 Saladin and the Ayyubid dynasty:

This much celebrated medieval general has been written about extensively by Western and Muslim scholars in both modern and medieval times. An officer in the service of the Governor of Syria, Nur Al-Din Zengi, he rose quickly in the ranks of the army. He had deposed the Fatimid rulers of Egypt in 1171CE and served as Nur Al-Din's vizier in Egypt. With the death of Nur Al-Din in 1174CE, Saladin became the undisputed leader of Greater Syria and Egypt (Hindley, 2007, pp 83). Saladin was from the Ayyubid family and his rise to the Sultanate was the start of yet another dynasty within the already fractured Abbasid Caliphate despite Saladin's allegiance to the Caliph of Baghdad.

For the next two decades, the new Sultan of Egypt launched several attacks against Crusader strongholds. The charismatic leader won the hearts of many Muslims within the Caliphate and his resolve to regain the lost lands from the Crusaders and restore Muslim dominance over Palestine only endeared him further to the population. His generosity to both Christians and Jews completed the picture of a chivalrous ruler. Saladin's physician was the well-known medieval doctor Al-Ma'mun or Maimonides. Maimonides had been invited by the Crusader General Richard the Lion-Heart, King of England to work for him but the great physician politely refused as he would not leave Saladin's service (Rosner, 2002, pp 125 - 128).

Saladin's campaigns finally bore fruit and in October of 1187CE, the city of Jerusalem capitulated to Saladin's forces. The victory raised the morale of Muslim forces round the Caliphate. The title of "Victor" was attached to Saladin much to the displeasure of

the Abbasid Caliph in Baghdad who felt that title was exclusive to him (Hindley, 2007, pp 138). A further truce between Saladin and Richard the Lion Heart in 1192CE ended any further crusader incursions on Palestine. Saladin died in 1193CE. His descendants were however less able than himself and the Abbasid Caliphate lost a champion that was capable of defending the frontiers of the State.

6.4.5 The effect of the wars and the internal strife on Public Health:

The internal wars between several factions within the Caliphate and its external conflict would have had a deleterious effect on the health of the population during the last century of the Abbasid era. Peace is an important social determinant of health and as has been previously discussed, civil wars and external conflicts do affect health adversely as is shown by modern day research.

The effect of the wars in the Caliphate would have seriously affected economy and in turn would have affected the welfare state as funds were channelled into the war programmes. Indeed, even the celebrated Saladin in the initial campaigns was known to have stretched the economy of Egypt to its limit due to the war campaigns. However, the wars did not stop the advancements in the medical profession and the academies and hospitals appear to have continued to function. Indeed Nur Al-Din Zengi and Saladin are known to have built hospitals in their time and Saladin expanded the St John's Hospital in Jerusalem after the takeover of the city. Furthermore, scientists and physicians still continued their writings.

This picture shows a mixture of events that affect public health. There was lack of peace, the welfare system would not have been functioning optimally and thus the social determinants of health were not applied wholly. On the other hand, the medical delivery system seemed to have been functioning. It appears that the Governments of the time gave hospitals a high priority and even if funds were channelled away from other welfare projects, the hospital system appears to still have received its funds. It is difficult to determine the net

effect on population health in the presence of a functioning hospital system with deterioration in the social determinants of health in the last century of the Abbasid era. However, modern research may be able to help to decipher the shift in balance of health during world war as in the last century of the Abbasid era, it was effectively world war.

The impact of World War I on the civilian health in Britain has been studied showing an increase in mortality; World War II also had deleterious health effects on the civilian population especially children (Winter, 1977, pp 487 - 503). The impact during World War I on the civilian population was summarised by Drummond and Wilbraham:

> "There is clear evidence that the general state of health [in England] did decline. The most obvious sign was the lowered resistance to infection. The people could not stand up to the terrible epidemic of influenza which swept across Europe in 1918. They died like flies; the mortality in London in some weeks was as high as 2,500. At the time it was thought that the severity of the epidemic was due to a particularly virulent strain of the infective organism. With our modern knowledge of the influence of diet on resistance to infective diseases, we can see that vitamin deficiencies had prepared the way" (Winter, 1977, pp 488).

There were between three hundred thousand excess civilian deaths in Britain during World War I with some writers putting the figure as closer to four hundred thousand (Winter, 1977, pp 487 - 503). There were hospitals in Britain during World War I. Indeed the war had actually caused advances in the medical field especially in the field of trauma and chest injuries. Many of the advances were incorporated in medical practices. Thus the situation in Britain during World War I is similar to that of the Caliphate in its last century of incessant war – a functioning hospital system with advancements in medical practice but with deterioration in the social determinants of health. The end result was an overall decline in the health of British civilians with excess civilian deaths. It is plausible considering the

similarities in the two historical scenarios that the same occurred in the later part of the Abbasid Caliphate and this could be a future area of research.

6.4.6 The final collapse of the Abbasid Caliphate:

The continued deterioration in the Abbasid control over the provinces ended with a complete disarray of the Abbasid state. Threats started in the North where the Mongols were already making incursions into the lands of the Caliphate encouraged by the internal strife and the disarray of the Baghdad government. The Baghdad Caliphate did not make sufficient preparations for the oncoming storm of the Mongol invaders.

It all came to an end in 1258CE. The horror of the Mongol onslaught on the Abbasid Caliphate has been reported by many historians in the medieval period and has been analysed further by modern historians. A brief summary is given here (Chughtai, 2003, pp 18).

Hulagu Khan, the grandson of Genghis Khan led the Mongolian army to the outskirts of Baghdad. In February of 1258CE, Hulagu marched into Baghdad. The Caliph Al-Mustasim was the last Abbasid Caliph. He was brought to Hulagu and forced to watch from a balcony the complete destruction of the golden "City of Peace". Hulagu taunted the Caliph for not taking the necessary steps in defending the city. The Mongols carried a complete massacre and the great mosques, hospitals, monuments and libraries of Baghdad were burnt down. Scholars have lamented the burning of the Grand Library of Baghdad with loss of the world's treasure of books and knowledge amounting to hundreds of thousands. The Books that were not burnt were thrown into the Tigris River and scholars reported that the water became dark with the ink of the books.

Men, women and children were killed at will with little or no resistance. Hulagu then had the Caliph's family executed with the exception of a daughter who became a slave to Hulagu and a son who was carried back to the Mongolian court. The Mongols were afraid of directly spilling the blood of the Caliph due to a fear that a curse may befall them if they

spilled royal blood. Thus Al-Mustasim was wrapped up in a carpet and put on the streets of the city and trampled upon by hospitals till he died.

A few days of destruction was what it took to destroy the capital of the Golden Age of Islam. Baghdad never fully recovered since that year. The deaths have been reported in varied reports but estimates have been between 200,000 to one million (Chughtai, 2003, pp 18).

6.4.7 The Aftermath:

The sacking of Baghdad sent waves of fear to the Western part of the Caliphate. The Caliphate was essentially ended. However, the Mamluk rulers of Egypt rallied their troops to prevent the further incursion of the Mongols into the Western lands of the Caliphate.

In 1260CE, the Mongol army was decisively defeated in the battle of Ayn Jalut by the Egyptian Mamluk forces ending the Mongol expansion. The defeat of the Mongols served to raise the morale of the Muslims once more and the myth that the Mongols were invincible was broken. A remnant of the Abbasid family was brought to Egypt and an attempt to re-establish the Caliphate in Cairo was made but really the Caliphate had effectively ended.

The lands held by the Mamluks however continued to flourish and indeed one of the largest hospitals built in Islamic lands was completed in 1284CE only 26 years after the effective end of the Abbasids. Andrew Miller's description of this massive medical institution is provided here:

"The Al-Mansuri Hospital was constructed in Cairo in 1284 AD at the behest of the Egyptian ruler Al-Mansur Qalawun, and served as a prototype for subsequent bimaristans. The Al-Mansuri bimaristan was one of the largest and most elaborate hospitals ever built. It had a total capacity of 8000 beds, and the annual income from endowments alone was one million dirhams. It freely served all citizens without regard for their colour, religion, sex, age or social status. There was no limit to the time a patient could be treated as an inpatient, thus the patient could stay until he was fully recovered. Patients who were cured of their maladies but

still too weak for discharge were transferred to the convalescent ward until they were healthy enough to leave" (Miller, 2006, pp 616).

The Muslim lands would continue to exert significant influence on the sciences. The contribution to the European Renaissance is significant with the 13th century seeing massive translations of Arabic works into Latin. Prominent translators such as Gerard of Cremona translated several works. The Arabic works would continue to be used in European academies for centuries.

As for the Caliphate, the next two centuries after the Mongol invasion showed major military operations done by Muslim forces. Finally, it was again the Turks who after the invasion of Constantinople in 1453CE under the Sultan Mehmed Al Fatih or Mehmed the Conqueror that would set up the Ottoman Caliphate that was to continue till the beginning of the 20th century. The Ottomans contributed greatly to the development of medicine but their works, achievements and their subsequent decline is beyond this thesis.

The next chapter looks at an overview of the Islamic Economic System in order to better understand the funding streams of the Islamic Welfare State and its hospital systems.

Results/Discussion

Chapter 7: The Economy of the Caliphate: an Overview

In this chapter, the following topics will be covered:

1. The moral principles of Islamic Economics
2. Sources of income of the Islamic Caliphate
3. The expenditure of the Islamic Caliphate
4. Practical examples from the different eras

7.1 Introduction:

So far we have dealt with the welfare state of Islam and its effect on health and the medical system put in place via its hospital system. The question of funding remains paramount in the delivery of any social welfare programme, health system or hospital system. This section looks at the economic principles of the Islamic Welfare State and will shed light on the funding pools that the State depended upon in financing its social welfare and health care system.

This section will depend heavily on the validated work of the modern scholar of Islamic Economics Dr S Hasan-uz-Zaman whose work on the subject with particular reference to the period of the Prophet, the Righteous Four and the Ummayad eras was awarded a PhD from the University of Edinburgh. His sources are very similar to the ones used throughout this thesis from the historical point of view. Rather than mentioning individual sources, this chapter will simply reference the modern scholar's work, considering it through the public health frame developed so far. This research is the first to place the Islamic Health Service with its welfare and medical delivery systems side by side with its funding streams to further substantiate the viability of the system that has been described throughout this research. This chapter simply answers the question "where did they get the money from?"

7.2 The Moral principles in Economic policies – the role of Charity:

The Islamic State is founded on the principles of the Qur'an and the Traditions of the Prophet. The Islamic economic term used for charity is "Sadaqa". The principles of charity were encouraged right at the outset of the Prophet's career even prior to this migration to Medina to set up the first Islamic State according to the Qur'an.

One of the early verses revealed to the Prophet of Islam was:

"Therefore treat not the orphan with harshness nor repulse he who asks" (Qur'an: 93: 9 - 10)

Furthermore, the Qur'an instructs:

"So fear God as much as you can; listen and obey; and spend in charity for the benefit of your own souls; and those saved from the covetousness of their own souls – they are the ones that achieve prosperity. If you loan to God a beautiful loan, He will double it to your credit and He will grant you forgiveness; for God is most ready to appreciate service – Most forbearing" (Qur'an: 64: 16 - 17).

The "beautiful loan" in the above verse here refers to charity. "Loaning to God" in the Qur'an means that the charity is given in the cause of God as in giving to the needy.

There are numerous other verses in the Qur'an that encourage the Muslims to give out in charity. Furthermore the Prophet of Islam is recorded as saying:

"Do not withhold your money (for if you did so), God would withhold His Blessings from you" (Al-Bukhari in Khan, 1994, pp 359).

In another narration, the Prophet is quoted as saying:

"Every Muslim has to give in charity'. The people asked 'O God's Prophet! If someone has nothing to give, what will he do?' The Prophet replied 'He should work with his hands and benefit himself and also give in charity (from what he earns)'. The people further asked 'if he cannot do even that?' He replied 'He should help the needy who appeal for help'. Then the people asked 'if he cannot do that?' He replied 'then he should perform all that is good and

keep away from all that is evil and this will be regarded as charitable deeds" (Al-Bukhari in Khan, 1994, pp 359).

Again there are other numerous sayings of the Prophet of Islam enjoining the people to give out in charity. With the birth of the Islamic Welfare State in Medina under the Prophet's rule, charity money was also donated directly to the State as this was permissible and encouraged by Islamic Law. It was from this very principle of charity through the State that the system of Waqf or "Trust" was born.

The Waqf system allowed the wealthy to bequeath some of their property either to the Government or certain institutions for the benefit of the poor and the needy. This would continue even after their death. Many of the hospitals in the Islamic Caliphate in later times would benefit from this system which contributed largely to the funding of the health system. Prior to the setting up of hospitals, Waqf property or businesses supported mosques, schools and other social welfare institutions which as previously discussed directly affected the health of the population.

7.3 Modern comparisons of the effect of charity on health care:

In modern day health care, charitable organisations play a major part in providing extra money to the improvement of health care. Through social welfare organisations, charitable money is used to look after the needy and the destitute even with the boundaries of rich western nations. Indeed in Britain, charitable organisations and their income are exempt from general taxation and taxes on money by donors could be claimed by the organisations if the donor so wishes.

A recent report on the use of charity money in the UK was provided by the charity organisation Charity Aid Foundation in its UK Giving 2012 report (CAF, 2012). The report showed that about 55% of adults in the UK gave out in charity in 2012 equivalent to 28.4 million adults. The total amount collected according to the report was 9.3 billion sterling

pounds. Interestingly, the report showed that 33% of donors gave money to medical research, 30% of donors gave to hospitals, 23% gave to children, 11% gave to the disabled, 8% gave to other health care programmes, 8% gave to the homeless, and 6% gave to the elderly. Thus most donors gave to either health care related programmes to social welfare related programmes – a striking similarity to the Islamic Caliphate's charitable funding system. Indeed, according to the same UK report, 33% of the £9.3 billion collected went to hospitals, medical research and other health related programmes and 19% went to social welfare activities. Thus about half of the money went into health and social care.

One thus cannot under-estimate the huge potential of charitable donations to health care and the effect they can have on the sustainability of the health care system. In the UK, the medical regulatory body, the General Medical Council is a registered Charity and is not funded completely by the Government (GMC, 2013). Training and examination of postgraduate medical professionals in the UK is undertaken by the 15 Royal Colleges and all 15 are registered charities (AOMRC, 2013).

In addition the UK's highest research body, the Medical Research Council has its independently managed charity known as the Medical Research Foundation. According to the Medical Research Council:

> "The public make bequests and donations to the MRF to support MRC research. During 2011/12 the MRC provided the trustees with advice on scientific strategy and research opportunities, and peer review support. The MRF made over £2.8 million available for new research within the MRC's remit" (MRC, 2013).

The above statement is quite similar to the way the Waqf system works especially in the matter of the "public bequeathing" towards the organisation. The Waqf system still is in place in many Muslim nations and indeed in Egypt for instance, there is a specific Ministry of

Waqf with its own Minister and executive team. However, anecdotal evidence and personal experience suggests that its efficiency is certainly not up to that of the medieval Caliphate.

7.4 State income:

Charity was not the only source of income though as no nation can survive on the charitable deeds of the population. Taxes were enforced on the citizens of the nation. The following subsections look at the other sources of income of the Islamic Caliphate.

7.4.1 The Poor Tax – the Zakat:

The previous section looked at funds through charity and "Trusts". In Islam, charity is a voluntary action left to the individual: the Prophet encouraged it as shown in the previous narrative. However, the Islamic Economic State has its own tax system. Like any tax system, this is a compulsory tax that is levied upon the population. The poor are exempted from this compulsory taxation and indeed are entitled to social welfare benefits that depend on these taxations. The first compulsory tax in Islam is called the Poor Tax or the Zakat. Zakat as it is popularly known is one of the five pillars of Islam and is compulsory on all Muslims who are not exempt from tax. The five pillars of Islam are listed below:

1. Belief in One God (Allah) and Muhammad as His Messenger
2. The five daily prayers
3. Payment of the Zakat
4. Fasting the month of Ramadan
5. Pilgrimage to Mecca for those that can afford it at least once in a life time.

Thus Zakat being the third pillar of Islam is an extremely important factor in Muslim life. Zakat was first ordained on the Muslims in Medina after the birth of the Islamic State. Unlike Sadaqa (Charity) which started right from the outset of the Prophet's message, Zakat became obligatory only when the State was available. This was simply because the Zakat was to be collected by the State.

The early State set up the administrative structures for tax assessment and collection. 'Zakat' literally means 'growth'or "purification (Choudhry, 2003). The use of these terms by the religion is to inform the tax payer that the money paid is both on moral and ethical grounds and that it promotes growth and development of the community and the state (Choudhry, 2003). The Qur'an instructs the believers with regards to the Zakat:

> "Establish worship, pay the poor-due (Zakat) and bow your heads with those who bow (in worship)" (Qur'an: 2:43).

In addition the Prophet Muhammad is instructed by God to:

> "Of their goods, take alms, that so thou mightest purify and sanctify them; and pray on their behalf. Verily thy prayers are a source of security for them: And Allah is One Who heareth and knoweth" (Qur'an: 9:103).

Prior to going into some detail of this very important funding system, a few definitions need to be clarified:

1. Dirham: 3.98 grams of silver
2. Dinar: 4.25 grams of Gold
3. Wasq: 190Kg

It has also to be emphasized that the Zakat is the tax imposed on Muslim citizens. Non-Muslim citizens have a different tax which is a fixed amount of money that is paid once the non-Muslim citizen had crossed the threshold amount of savings stipulated by the State. This is discussed later.

The following are the Zakat rates applied on items after one year by the Islamic Economic System (Hasan-uz-Zaman, 1991, pp 65):

a. Items charged at 2.5%:

These include Gold, Silver, Cash and articles of trade. The minimum owned before taxation starts is the value of 200 dirhams or 20 dinars. The tax is payable after the "lapse of one full year of holding the value" (Hasan-uz-Zaman, 1991, pp 65).

b. Items charged at 5%:

These include crops such as dates, wheat, barley, corn, grains, grapes, raisins and olives. The minimum owned before taxation is 5 Wasqs (950Kg). It is payable at the time of harvesting. The charge of 5% is levied if the crops were irrigated using artificial irrigation. However, if no artificial irrigation was used, the tax levy is 10%.

c. Items charged at 20%:

This includes treasure – troves or unclaimed wealth found in deserted places.

d. Taxes on animals:

1. Sheep/Goats: Minimum to be owned before taxation is 40. The rate after that is one animal for every 40 animals
2. Cow/Ox: The minimum ownership is 30 animals. For thirty animals, the rate is a 1 year old calf. However if the ownership is above 40 animals, the rate changes to a 2 year old calf.
3. Camels: For a minimum ownership of 5 camels, the tax is one sheep. Once the herd of camels goes up to 25 camels, the tax is a one year old she-camel.

7.4.2 The Islamic Principles of Land Economics:

The Prophet had divided land into two main categories: land for buildings and construction and land for farming. Lands could be given to the private sector for reclamation and development as was seen in the era of the Righteous Four especially in the period of Uthman, the third Caliph. With the expansion of the Caliphate, vast amount of lands that were not in use came under the control of the Islamic State. For instance in Iraq, the State took over the following as part of its treasury (Hasan-uz-Zaman, 1991, pp 125):

a. Forests
b. Ponds and pools
c. The land of the Persian emperor
d. The whole of Dayr Yazid

This was in addition to land property as a direct consequence of war such as the lands of Persian soldiers that were killed in battle (Hasan-uz-Zaman, 1991, pp 125).

7.4. 3 The Land tax:

Here again the principles of justice are applied in the policy regarding land tax. The tax on land in the Islamic Caliphate varied in the early Caliphate. In the time of Omar the second Righteous Caliph, he instructed that the locals of the conquered lands were involved in the calculation of the taxation process to make sure it was equitable (Hasan-uz-Zaman, 1991, pp 202). There was a lot of leniency exhibited by the tax collectors as ordered by the Caliphs especially in the era of the Righteous Four.

The fourth Caliph Ali had ordered his officials not to sell the horses of the tax payers in the event of their inability to pay their land taxes. In addition they should not sell their other animals or their clothes nor to let them stand in the sun but that considerable kindness and leniency must be meted to the tax-payer. When one of his officials commented that this may result in little or no taxes the Caliph replied:

"Beware! We are ordered to collect from them with leniency!" (Hasan-uz-Zaman, 1991, pp 203).

Indeed during the reign of the first Ummayad Caliph Muawiyah, his governor of Iraq received reports of some of the injustices committed by Muslim tax collectors. He immediately replaced them with natives (Hasan-uz-Zaman, 1991, pp 203). The income from land tax will be discussed later.

7.4.4 The Poll tax (or Jizya):

The poll tax was a special type of tax that was placed on Non-Muslim citizens in lieu of military protection and military service. It was placed on those non-Muslim citizens that could afford it. Unlike the Zakat that was placed on the Muslim citizens, the poll tax was a fixed amount of money and not a percentage of wealth as the Zakat. Non-Muslim citizens who were poor were exempt from this tax. According to scholars:

"the very old and the crippled were exempt in addition to women and children. Similarly the monks in their monasteries also remained exempt" (Hasan-uz-Zaman, 1991, pp 208).

7.4.5 The Booty:

This was wealth acquired directly as a result of war from the battlefield. Four fifths of the booty went to the actual fighters and one fifth of the booty went directly to State coffers. The one fifth aspect that went to the State was used alongside other taxes to fund the State projects (Hasan-uz-Zaman, 1991, pp 157). With the conquests of Persia, North Africa and large parts of the Byzantine Empire, this particular income was still considered substantial even though it was not the main source of income for the State.

7.5 The Bayt ul Mal or the Treasury Department:

This concept has already been introduced in the section dealing with the era of the Righteous Four. The term literally means "the House of Wealth". This simply means the nation's Treasury Department. The concept of the State treasury, its income and expenditure had already been dictated by the Qur'an and the practice of the Prophet. It does seem that even in the early Medina period when the Prophet governed the State, the state treasury was in a separate building or area. The wealth of the Baytul Mal was to be regarded as the wealth of God to be used by the Muslim State (Hasan-uz-Zaman, 1991, pp 138). Officials thus had to have a high level of moral values in administering the funds in addition to the technical

talent and knowledge of economics and economic administration. There is evidence that members of the public were quite interested in the way the Government distributed the funds and would question Government policy. An example is when the Caliph Al Walid in the Ummayad Caliphate spent a large amount of money in reconstructing the mosque of Damascus. The public deemed it an "unjustifiable expenditure" and despite the Caliph defending his decision by showing that the Baytul mal had enough surplus to last for three years, the public was still not satisfied (Hasan-uz-Zaman, 1991, pp 140). It is important to note that later in the Ummayad Caliphate, the unjustifiable use of money from the Baytul Mal was part responsible for its downfall.

7.6 Interest:

Islam forbids the use of interest either at the individual level or at the level of national economics. That does not mean that Islam forbids lending. Islam regards lending to the needy a moral principle that cannot be exploited. Indeed the Qur'an asks the well to do lenders to reschedule their loans if the debtors are in difficulty of repayment (Qur'an: 2:280).

Islam however has clear rules to protect both lenders and borrowers. On a moral level, the Prophet on several occasions emphasised on living according to one's means and to avoid borrowing unless is absolutely necessary (Hasan-uz-Zaman, 1991, pp 73). To protect lenders, Islam insists that debts have to be paid prior to any inheritance shared.

The economy of the Islamic State is thus not dependent on interest and interest took no part in financing the health service in the Islamic Caliphate according to this research.

7.7 Amount of Revenue collected by the Caliphate:

We have numerous resources on the revenue collections from several provinces in different times during the Caliphate's period. The modern day scholar Hasan-u-Zaman has provided several comparisons. The discussion below draws on his findings but has also added

a modern day value of the amount of silver and gold collected by the state. The next table (Table 11) gives a snapshot example of the collections from Iraq during certain periods within the three eras (Hasan-uz-Zaman, 1991, pp 218). The calculations in modern day currency were performed by the student.

Table 11: Annual revenue from Iraq: Calculations based on 3.98 grams of silver = 1 dirham = 2.73 dollars). http://coinapps.com/silver/gram/calculator/ Accessed 12/10/2013

Period	Dirhams (in millions)	Modern day calculation
Caliph Umar (Righteous Four)	100	$US273, 000, 000
Caliph Uthman (Righteous Four)	100	$US273, 000, 000
Caliph Ali (Righteous Four)	100	$US 273, 000, 000
Muawiyah (Ummayad)	120	$US 327, 600, 000
Abdel-Malik (Ummayad)	40	$US 109, 200, 000
Umar II (Ummayad)	80	$US 218, 400, 000
Harun Al-Rashid (Abbasid)	100	$US 273, 000, 000

The table shows a fairly stable economy with income over almost 200 years very similar. The decline during Abdel-Malik's time was due to a period of civil war that plagued the Caliphate and Iraq exchanged hands between rival Caliphs until Abdel-Malik was finally victorious in uniting the whole Caliphate under his rule. The next table (Table 12) shows income from other smaller provinces (Hasan-uz-Zaman, 1991, pp 224).

Table 12: Estimated Annual Collections from Syria and Palestine in dinars: (1 dinar = 4.25 grams of Gold = $US190.86 dollars) http://www.goldpriceoz.com/gold-price-per-gram/

Accessed 12/10/2013

City	Muawiyah (Ummayad)	Abdel Malik (Ummayad)	Al-Mansur (Abbasid)
Damascus	450,000	400,000	420,000
Emmessa, Qinessrin and Awasim	170,000	800,000	990,000
Jordan	180,000	180,000	97,000
Palestine	450,000	350,000	310,000
Cyprus	7,000	8,000	7,000
Total in Dinars	1,257,000	1,738,000	1,824,000
Total in US dollars	239, 911, 000	331,714,000	348,128,000

In the rich province of Egypt we have an approximate amount of annual revenue into the Caliphate's coiffures at different periods as well as shown in the next table (Hasan-uz-Zaman, 1991, pp 246).

Table 13: Annual income from Egypt in Dinars (1 dinar = 4.25 grams of Gold = $US190.86 dollars) http://www.goldpriceoz.com/gold-price-per-gram/ Accessed 12/10/2013

Period	Amount in Dinars	Amount in US dollars
Caliph Umar (Righteous Four)	12 million	2.29 Billion
Caliph Uthman (Righteous Four)	14 million	2.66 Billion
Caliph Muawiyah (Ummayad)	5 million	953 million
Caliph Harun (Abbasid)	4.2 million	800 million
Caliph Al-Ma'mun (Abbasid)	4 million	762 million

Explaining the discrepancy in the income across the different periods is that parts of the North African nations were added to Egypt as a single revenue. When some of these nations became parts of other provinces, their revenues were not added to the Egyptian revenue (Hasan-uz-Zaman, 1991, pp 246).

The above is a snapshot of some of the provincial revenues to the Government of the time. The above is by no means exhaustive. For instance, it is recorded that the annual income from the Persian provinces only in the time of the Ummayad Caliph Muawiyah was 285 million dirhams or $US778 million (Hasan-uz-Zaman, 1991, pp 267).

Obviously the purchasing power is different across almost 14 centuries. The above tables show a rich state and the details of the economic system including the quality of life is beyond this research. However, the administrative set up regulating the state economy has been studied and the complex system well documented with provincial "Baytul Mal"s set up (Hasan-uz-Zaman, 1991, pp 291).

Having summarised the sources of income of the State and provided data to show the actual income in some eras, the next section will look at the State expenditure as promulgated by Islamic law.

7.8 Expenses of the Government in the Islamic Caliphate:

The following are regarded as part of Government expenditure using public money in the Islamic Caliphate (Hasan-uz-Zaman, 1991, pp 74 - 82):

7.8.1 Defence:

Islam is intolerant to injustice, persecution, military aggression and oppression. If peaceful means fail, the Qur'an instructs:

> "And fight them until persecution is no more and religion is for Allah. But if they desist, then let there be no hostility except against wrong doers" (Qur'an 2:193).

Maintaining the peace and protecting the nation from external aggression is a cardinal responsibility of the State and the Armed Forces are to be financed by the State Treasury. The use of weaponry is emphasised in the Qur'anic verse:

"Make ready for them all you can of (armed force) and of horses tethered that thereby ye may dismay the enemy of Allah and your enemy and others beside them whom ye know not. Allah knoweth them. Whatsoever ye spend in the way of Allah it will be repaid to you in full and you will not be wronged" (Qur'an: 8:60).

The Caliphate of Islam was generally a very powerful state especially at its peak. That military prowess did go a long way in establishing the peace. The role of peace in health care has already been discussed previously and is vital for the health of the population and is indeed the first determinant of health set by the WHO Ottawa charter. Furthermore in this thesis, we have seen a decline in health when the peace was disturbed either by internal civil war or external invasions.

7.8.2 Education and research:

The Qur'an instructs Muslims to seek for knowledge. Studying social laws (Qur'an: 2:221), economic spending policies (Qur'an: 2:219), studying the structure of living things (Qur'an: 16:4), astronomy (Qur'an: 2:164), natural resources (Qur'an: 16:65 – 9) and creation (Qur'an: 30: 19 – 28) are all encouraged by the Qur'an (Hasan-uz-Zaman, 1991, pp 76 - 77). These invariably need research institutions, academies, observatories, laboratories and above all organised planning. The Abbasid caliphate was rich in these institutions and many historians regard that era as the "Golden age of Islam" from the point of view of scientific advances. The funding for most of these institutions especially the larger ones came from the State Treasury.

7.8.3 Moral Reform and surveillance:

The Qur'an instructs:

> "And there may spring a nation who invite to goodness and enjoin right conduct and forbid in decency. Such are they who are successful" (Quran: 3: 104).

The essence of the above verse is enjoining what is good and forbidding what is evil. This creates and strengthens the moral fabric of the society. This was also regarded as a function of the Islamic State. In order to perform this function, the State needed a large number of preachers and teachers who would provide moral instruction to citizens to encourage them to be law abiding and to adhere to moral principles. These officials were naturally paid by the State. In order to check the efficacy of the system, the Government had a "hisba institution" whose job was to ensure that citizens and officials discharged their duties according to the moral values of the nation (Hasan-uz-Zaman, 1991, pp 78).

7.8.4 Maintenance of law and order:

It was the job of the Caliphate to ensure that law and order were enforced within its boundaries. That involved setting up a judicial system in all the provinces that supported by an internal armed force – what we call today the police force. The Islamic Judicial system is a complete system and can be very complicated and judges and scholars had to be trained. The State was responsible for the financing of these officials and their institutions (Hasan-uz-Zaman, 1991, pp 80).

7.8.5 The welfare system:

This has been discussed in detail in previous sections. The Qur'an places emphasis on "food, clothing, shelter, transport, life-saving and health" (Hasan-uz-Zaman, 1991, pp 81). These have been classified as Government duties. The implementation of such social welfare policies involves several departments including "agriculture, industry, construction, transport,

communications and health" (Hasan-uz-Zaman, 1991, pp 81). Many of these departments have been discussed in detail in in previous sections.

7.8.6 Foreign relations:

The Islamic State in obedience to the Qur'anic injunctions with regards to peace and war is bound to have diplomatic missions with other nations to protect the interests of the Islamic state. These missions existed right from the time of the Prophet himself and the funding of the foreign missions came from the State Treasury (Hasan-uz-Zaman, 1991, pp 82).

7.8.7 Agricultural reforms:

As seen in previous sections, the State expenditure also included protection of farmers, reclamation of lands, construction of dams and irrigation canals. These were very common in Syria, Iraq and Egypt and the historical data in this thesis did highlight several of these massive projects. The effects on public health from the point of view of both income and food production have also been discussed in previous sections.

7.8.8 Construction of Public Infrastructure:

These have already been discussed in several previous sections. As a summary public infrastructures that come under the State's expenditure include housing (as seen in the periods of the Righteous Four), urban planning as seen during all three eras with the construction of cities, markets, mosques and hospitals. The State also financed the Rest houses of travellers as seen in the era of the Righteous Four. In addition the communications system which developed to very sophisticated levels during the whole period was funded through State expenditure.

However, it is clear that even though the economy appeared viable and indeed similar in many periods of the Caliphate, the distribution of welfare services differed across the 600 year period. Modern day public health has maintained that leadership and culture have huge

impact on public health irrespective of the financial situation. The next chapter will discuss an overview of culture and leadership in the Islamic Caliphate and its effect on public health using modern day insights.

Results/Discussion

Chapter 8: Leadership and culture in the Islamic Caliphate and its effect on Health Care

In this chapter, the following topics will be covered:

1. The role of culture and its effect on health with modern comparisons
2. The role of leadership and its effect on health care policy

8.1 The impact of cultures and beliefs on State institutions:

This thesis has traced so far almost 600 years of health care delivery and services from the initiation of welfare systems to the biomedical treatment of the sick. The Caliphate was a multicultural State but the rule was based on the laws of the Qur'an and the traditions. The Caliphate however encouraged a system of whereby talent was recognised irrespective of religion or ethnic groups. Indeed the thesis has highlighted that several senior members of the Government who acted as advisors to Caliphs were not Muslims and many of the scientists were not Arabs.

Peoples' cultures and beliefs have a huge impact on the way health systems are delivered and funded and the expectations of the population with regards to health and welfare could influence Government policy. The present day UK for instance has seen in the last 6 decades the influence of the state of the NHS on the voting of the electorate. Indeed one of the major reasons for the revolt against the Ummayad dynasty in its later stages was the lack of social justice and the deterioration in the social welfare system.

In modern times, the WHO defines a good health system as one that "delivers quality services to all people, when and where they need them" (WHO, 2013c). Hofstede has described four major factors that affect the relationship between people's cultures and the way they affect their State institutions including health care delivery (Hannagan et al., 2010, pp 255 - 256). These included power distance (the way society deals with inequalities within it), uncertainty avoidance (the organisational structures and processes that govern societies), individualism (the level of community cohesion within societies), and masculinity (gross

outcomes versus quality). These in themselves are applicable to the way a society perceives health and will have a huge impact on the way the health system is structured.

To further understand the above, for instance, a highly capitalist culture exists in the United States. This culture is dependent more on individualism and the reduction of the power and involvement of the Government on people's lives. This has greatly influenced the way the health service in the US is designed. The Health Maintenance Organisations (HMO) were the major funding streams of the medical delivery system prior to the proposed introduction of Obama Care. The system prior to the introduction of Obama Care meant that many poor citizens were not covered by health insurance. The culture of competition and achievement in the US also affected the health care system with HMOs competing with each other in a business market. Whilst this has in a way increased efficiency and brought down costs relatively (Walshe and Smith, 2011, pp 526), it still did not address the problem of universal access to health care.

The Islamic State right from the onset had a culture based on the religious belief of care of the sick. The numerous Qur'anic verses and traditions of the Prophet Muhammad that embodied the care of and kindness towards the sick influenced the policy that structured health care and care of the sick throughout the history of the Caliphate. This was especially seen in the era of the Righteous Four.

Culture also influenced the way the health care system was financed. As discussed earlier, a hybrid system existed where there was a private health care system for those who wished specific physicians to treat them at their own expense and a system where there was free health care services. Furthermore, the Islamic Health Care system showed a unique combination of funding the free health care service. Influenced by culture, hospitals were treated as Trusts (Waqf) to which charitable donations and businesses contributed to the budget of the hospital in addition to supplementary funding from the Government of the time.

It was noted in the previous sections that Governors of provinces and cities competed with each other on the building and funding of hospitals to show the people that they cared as this was the prevailing culture of the time.

Applying Hofstede's four dimensions to the Islamic Caliphate, one can see that the power distance relationship did indeed exist. As the Righteous Four set up a system to close health inequalities in addition to some Ummayad and Abbasid caliphs, this research also showed that the decline in both the Ummayad and the Abbasid Caliphates occurred when this power distance relationship worked in exactly the opposite direction with increase health inequalities within the population.

The second factor of uncertainty avoidance regards the institutions and processes that govern society. Again the Righteous Four appear to have had strong processes in place. The Ummayds too had very strong institutions and well managed processes especially at the peak of the Caliphate. Muawiyah's rule saw a massive development in the managerial processes governing the State and indeed improved on many of the policies set by the Righteous Four. These processes however declined in the later parts of the Ummayad dynasty which would have increased the level of uncertainty within the population and consequently increasing the unrest and discontent of the society.

The third factor is that of community cohesion. In general the Muslim communities in the Caliphate showed a high level of cohesion. The Prophet Muhammad's instruction in the first article of the Constitution of Medina had declared:

"They are one nation to the exclusion of other people" (Al-Mubarakpuri, 2002, pp 230).

That unity was however disregarded on several occasions during the 600 year period with the uprisings and the civil war. Furthermore as the Abbasid Caliphate disintegrated over the final 200 years of its rule, the several provinces achieved more autonomy and on some occasions

even fought themselves. That community cohesion would have been affected during the uprisings and the civil wars.

The final factor relates to quantity and quality. The historical narrative did provide a large amount of data that showed the amount of money that was spent on welfare. The welfare system was at its highest peak during the era of the Righteous Four and Omar II. The quality from the case incidents appears to have been high during that era as well with one citizen describing the "abundance" in the time of Uthman and Omar II distributing grains over the hills and mountains for the seasonal birds as there was surplus in the treasury. However, during the decline of both the Ummayad and the Abbasid Caliphate, there would have been a decline in both quantity and quality leading to discontent amongst the population.

8.2 Leadership – an overview of the Caliphate's style and its effect on health:

Modern day research has clearly shown that leadership is cardinal to the success of any health care system and public health experts have emphasised that professionals need to be trained in leadership roles for the success of any public health intervention. Leadership is the "process of motivating other people to act in particular ways in order to achieve specific goals" (Hannagan et al., 2010, pp 276).

Leadership in health care has been differentiated from the field of transactional management. Transactional management concerns itself with the processes that run the daily activities of any organisation and seeks to enforce and maintain enacted policies (Ingram, 2013). Where change is needed in any organisation or nation including national health care systems, transformational leadership is needed as transactional management only applies to existing policies where leaders create the policies. These leaders are capable of inspiring their followers and their tenure is characterised by increased creativity and recognition of the specific needs of the system (Schielt, 2013).

In modern day welfare systems, the UN for instance has recognised that transformational leadership is needed in order to implement the 8 millennium development goals that were agreed upon in 2000. These include eradicating extreme hunger and poverty, universal primary education, promoting gender equality and empowerment of women, reduction of childhood mortality, improving maternal health, combating communicable diseases such as HIV/AIDS and malaria, environmental sustainability and global partnership for development (UNDP, 2013).

These goals affect a health system from both the biomedical and the social perspectives.

A pertinent example of transformational leadership occurred in the English National Health Service at the beginning of the 21st century. The highly bureaucratic NHS was deemed inefficient and unsustainable in its present form (Maynard, 2005, pp 403 - 410). To improve on the situation, the Labour Government decided to transform the system and introduced a system of New Public Management. With massive investments in resources and an "army" of managers, the Government made some short term gains especially in the aspect of waiting times**.** Further changes occurred by decentralising the management of hospitals and granting autonomy to Trusts via their conversion to Foundation Trusts (Monitor, 2010b)**.** The intended actions of the new policies were to allow hospitals to be freed up from the central bureaucracy. By giving the hospitals the autonomy to manage their own funds and to dispense services allowed competition to occur within the system.

It has to be said here that transformational leadership does not necessarily always produce good results. The Labour Government had been heavily criticised in some of its transformational policies in the health care system. However, transformational leadership is needed when change is necessary.

Historically the English health care system underwent tremendous changes in 1948 when the NHS was first set up. The Labour Government had just won the election after World War

II ending the government of Prime Minister Winston Churchill. The well-known architect of the NHS, Aneurin Bevan, a charismatic Welshman, became the Health Minister. The transformational leadership provided by Bevan is indeed exemplary as he succeeded in setting up the service despite the massive opposition from the Conservative party and members of the medical profession. However, a few years later, the service had become so popular that even the Conservatives promised to keep it (NHS, 2011b).

The above principles of transformational leadership and its interplay with transactional management in health care could be applied to the Islamic Caliphate. Prior to Islam, no structured health care or welfare system existed in the Arabian Peninsula. With the advent of Islam, change did occur and quite rapidly. The Peninsula through the transformational leadership of the Prophet of Islam had been converted into a social welfare state after 23 years of the Prophet's career.

The Righteous Four era showed transformational leadership enforcing change in the provinces that came under the rule of the Caliphate from Persia to North Africa. The social welfare network was well supported by meticulous managers as is evident by the historical sources previously discussed. The system went through several changes during the era of the Righteous Four showing the transformational leadership that was employed. The Ummayad and Abbasid Caliphates showed changes at different stages of history. Starting a hospital service, through to financing and setting up State organised validation of doctors were all changes at national level that needed strong transformational leadership with development of sweeping policies across the State.

The leadership by example seen by several Caliphs especially in the first era does satisfy the requirements of transformational leadership in modern times. In health care the leadership of the two governors of Greater Syria in the plague of Emmaus in the era of the Righteous Four made the quarantine more effective as it showed that the Law applied to all. Indeed, the

governors paid the supreme sacrifice and lost their lives whilst they could have had a chance of fleeing the epidemic as was seen in the historical narrative in the case of an Ummayad Caliph.

8.3 Leadership and corruption:

Leadership is also necessary in combating corruption. The level of corruption in the Islamic Caliphate was dependent on the type of leadership in power. It was minimal at the time of the Righteous Four and was significant enough to cause discontent and rebellion in the last part of the Ummayad dynasty. The level of corruption is well-known in modern day research to be inversely proportional to the health and social status of the society.

The WHO defines four aspects to corruption in health care systems. These are bribery, theft, political corruption and false information provided for the intention of private enterprise (WHO, 2014b). Corruption directly affects the delivery of health care systems and increases the health inequality gap. This has been the stand of the WHO and the reason the organisation gives is that corruption reduces entrepreneurial activity and damages the macro-economy (WHO, 2014b). The WHO believes a multisectoral team effort to combat corruption through transparent networking and public openness are the ways to deal with complex problem. As an example in modern times, corruption is quite common on the African continent and health is adversely affected. Almost 80% of the health care funds never reach the target facilities due to embezzlement (Transparency, 2013).

What makes health care so attractive to corruption schemes? The world spent three trillion dollars in 2006 on health care (Moszynski, 2006, pp 257). The Global Corruption Report of 2006 summarises the problem:

"As with any sector, health system corruption is less likely in societies where there is broad adherence to the rule of law, transparency and trust, where the public sector is ruled by

effective civil service codes and strong accountability mechanisms, and where there is an independent media and strong civil society" (Moszynski, 2006, pp 257).

The Islamic Caliphate is no exemption to the above statement. The high moral values set by the Righteous Caliphs and the high standards placed by their governors ensured an equitable distribution of wealth and welfare. The State's resources were effectively put into public interests. The Righteous Caliphs led by example as was shown by the second Caliph Omar who refused to eat properly during the famine that hit the Peninsula in his time.

The Ummayad era saw a rise in the level of corruption during its time. Omar II's policies attempted to reverse that trend and indeed succeeded during his short tenure illustrating the value of strong leadership at the top of the nation. After Omar II, the decline in welfare and increased corruption served as the main reasons for the military overthrow of the Ummayad Caliphate by their Abbasid counterparts.

The Abbasid era's five hundred year span also saw swings in transparency and corruption in almost the same way as the Ummayad dynasty. Towards the end of the Caliphate, the State had become so fragmented that a generalised judgement of the leadership situation is impossible, and different provinces would have exhibited different leadership patterns depending on who was the ruler.

Overall, it is clear that the Righteous Four's leadership represented the ideal leadership needed in the welfare State of Islam, an era that so far has not been reproducible in the Muslim world.

Results/Discussion

Chapter 9: Conclusions, Reflections and Further research

In this final chapter, the following topics will be covered:

1. An overall conclusion of the research will be provided with a summary time line of the health care system in the Islamic Caliphate.
2. The student's personal reflection on the seven year research project
3. Research questions that have stemmed out of this thesis and areas identified for future research.

9.1 Overview of conclusions:

This thesis has for the first time provided a history of public health in the Islamic Caliphate from a modern analytical point of view. The initial aims of this research were to identify any policies that may have affected population health in the Islamic Caliphate. As far as public health is concerned, this thesis has provided a chronology of events over a six hundred year period that has hitherto not been published. Indeed the policies enacted in the era of the Righteous Four and the Ummayad dynasty and their effect on health has not been studied previously and this thesis has provided some of the data and the modern day analysis.

9.2 The social determinants of health and the welfare state:

The historical records clearly show that the Islamic welfare system had its foundation in the time of the Prophet Muhammad and had significant developments in the era of the Righteous Four.

Until this research, the era of the Righteous Four has been largely ignored by historians of public health as was seen in the Literature Review. Furthermore, it is clear that almost every single social determinant of health including those identified by the Ottawa Charter of the World Health Organisation was seen in the policies of the Righteous Four.

The policies in this initial period appear quite sophisticated and case studies appear to support the argument that these policies were applied in the era of the Righteous Four. The

care of women and children, the needy and the orphans to mention but a few and their effect on their health have been highlighted through the historical data.

The public health aspect of this era has never been studied before by Muslim scholars in modern times. Perhaps, most Muslim scholars of today have confused the definition of medicine with the definition of health. As medical advancements were more significant during the Golden Age of the Abbasid era, the question of the social determinants of health and their effects on population health have been largely ignored. In adopting a public health approach rather than a focus on medical delivery systems, there is evidence that a "Golden Age" existed in the era of the Prophet and the Righteous Four. This was the Golden Age of the social determinants of health in the same way that the Abbasids had the Golden Age of medical advancements.

Indeed after the Righteous Four, this Golden Age of the social determinants of health never really reached the peak that it was during the Righteous Four apart from a few periods as in the time of the first Ummayad Caliph Muawiyah or the era of the Ummayad Caliph Omar II. That is not to say that the social determinants of health completely disappeared from the Islamic Caliphate. The historical data simply shows that these welfare policies did indeed continue but not to the same standards as the early period. This raises the question of leadership and it is clear that the leadership of the Righteous Four and their personalities were instrumental in the development of the welfare state according to the laws of the Qur'an and the Traditions of the Prophet.

Indeed the case studies that were shown in the early period show a dynamic and sophisticated State system in its response to natural disasters. The famine in the time of Omar would have been disastrous if not for the welfare system in place. It is interesting that in the 7th century, a medieval State was able to elicit a well co-ordinated multi-national aid response to the disaster engulfing the Peninsula. It shows a strong and transparent leadership and a

powerful communications system with State resources allocated efficiently and in a timely manner considering the technological restrictions of the time.

The reduction in the welfare system and the social determinants of health in the latter part of the Ummayad dynasty would have had a deleterious effect on population health. The disregard of quarantine laws as shown in the later part of that era shows a leadership that was certainly not equal to the standard of the early period. The dissatisfaction of the population is very revealing and indeed that did cause the collapse of the Ummayad caliphate.

This thesis has shown that at the different eras described, as the social determinants of health are applied effectively, it is reasonable to infer that population health would have improved and the converse is true. The Islamic caliphate was not always capable of providing adequate welfare for its citizens either due to war or due to weak leadership or even due to corruption as happened during some periods. The research shows that these social determinants of health are almost universal in time and place and can affect any population irrespective of the technological advancements. The modern day United States is one of the most technologically advanced nations in the history of mankind. Yet its lack of welfare systems to cater for needy women and children has been shown by modern research to affect the heath of this vulnerable group of the population. Indeed Omar's policies could very well work in the modern day world just as they did fourteen centuries ago.

This conclusion is based on the recommendations of contemporary researchers on the specific policies needed to address the welfare of needy women and children to improve their health. The recommendations are almost exactly the same as the policies of Omar – showing again the universal position of the social determinants of health.

9.3 The biomedical aspect of health care and the Islamic Caliphate:

The biomedical aspect of health care has been discussed by Muslim scholars since the medieval period. The "Medicine of the Prophet" has been a subject that Muslim scholars

have dealt with extensively. However, no scholarly work has been done to integrate this with the wider aspects of health care. This thesis has discussed the medical aspects of the Prophet's traditions - but in the light of modern day analysis of health, this research has, placed these traditions in their correct place, from a public health perspective, side by side with the social determinants of health, health maintenance and health care legislation. Such an analysis has provided, for the first time, a holistic view of what a complete Islamic Health Service would look like and provided again for the first time how such a service did indeed look like over a six hundred year period with its "ups and downs".

To confine health to medical care solely is no longer acceptable in the modern world as our understanding of public health in its true and holistic sense has increased. This thesis does not however deny the value of medical care and medical advancements to population health. Hence, even though the Abbasid era has been extensively studied by many historians, this thesis included the era but has located the Abbasid contribution to the Islamic Health Service in its correct position – at the end of the development of the service.

To date, most historians have confined the developments of Islamic health care to the Abbasid era due to adherence to a now outdated approach that medical care is synonymous with health care. They placed the development of Islamic Health care as beginning with the Abbasids, whereas the medical delivery system built by the Abbasids was really an extension of the work of the previous two eras in the aspect of social welfare.

The historical data provided explains that the medical system was an evolution of the welfare state systems set up by the Prophet and the Righteous Four. Indeed, the reason for the Abbasid-led revolt against the Ummayads and one of its cardinal reasons for success was the deterioration of the welfare system. The Abbasids were thus keen to prove to their population that they were different and that they were going to restore and improve on the welfare system. Thus the hospitals were built and were free at the point of service.

This thesis thus challenges previous research that the Abbasid era was the beginning of the development of the Islamic Health Service. The evidence provided shows it was the later development of the health service that was part of the Islamic welfare system and continued to be so under the Abbasid regime.

In the above context of State sponsored welfare and health care institutions, this thesis provides the bigger picture behind the myriad of scientists and physicians of the Abbasid era. Contrary to some modern historians of the era, the vast majority of these scientists were not simply the products of their own hard work or even the direct patronage of Caliphs. Whilst this may have been true for some of the physicians, that could not have been sufficient to produce the number of scientists and physicians that were produced in that era.

It is reasonable to conclude that the system described in this thesis had a major role in the production of these intellectuals in much the same way in the modern world where similar systems produce physicians and scientists. Thus the historical data suggests that the majority of the physicians (we need to recall that in 931CE, there were 860 physicians in Baghdad alone) were really the product of a national health system. This system was a holistic one that integrated medicine with public health in the general context of a sophisticated welfare regime. The following figure provides a simple summary of the time line of the Islamic Health System:

Fig 7: Time line of the Development of the Islamic Health Service

The Prophet Muhammad (622CE – 632CE):

1. Foundations of the Welfare State
2. Health Promotion and maintenance
3. Health care Legislation
4. Foundations of Medical care

↓

The Righteous Four (632CE – 661CE)

1. Evolution of the Welfare system
2. Care for the vulnerable
3. Nation Building
4. The "Golden Age" of the Social determinants of health

↓

The Ummayad Caliphate (661CE – 750CE)

1. Further development of the Welfare system in the early part
2. Economic expansion of the Caliphate
3. Occupational health within manufacturing estates
4. Translation movement started
5. First Hospitals start to appear
6. Decline in the social determinants of health in the latter period

↓

The Abbasid Caliphate (750CE – 1258CE)

1. The welfare system continues
2. The hospital system develops massively
3. The Translation movement progresses rapidly
4. The Golden Age of scientific advancements
5. Medical advancements
6. A surge in production of scientists and physicians
7. Medical licensing exams
8. Decline in both the social determinants and medical delivery in the latter part signifying a decline in the entire Health Service

9.4 Reflections on the Research:

This research has taken approximately seven years to complete. The research has had to combine techniques in historical research and modern public health analysis to provide a combined historical narrative spanning six hundred years of history with a modern day analysis. In retrospect, this research has had both strengths and weaknesses.

9.4.1 Strengths of the Research:

The research has depended on the largely accepted major chronicles of the medieval era that has been used by most historians and scholars of that era. It has been the helpful in this thesis as other research preceding it that these chronicles are preserved and are in print till this day. However, one particular strength of this research is that I am an Arab, a Muslim and a medical professional. Therefore the understanding of the data and the application of policies and their modern analysis would have been within my competence considering my medical background. This research is different from most other works on the subject where the authors have not been medical professionals. Even modern day historians of public health are largely outside the medical profession.

In recent times, some medical professionals have published on the works of the medieval physicians and some of these works have been cited in this research. However, no work has been done to examine the welfare system of the State and its effects on public health either by medical professionals or medical historians. This represents the first work on this subject and it is undertaken by a student who is a medical professional, an Arab and a Muslim. This brings in a distinctive combination of skills in reading and interpreting the sources especially that it uses the expertise of modern historians.

The historical data has been presented as a narrative to provide the reader with the events that surrounded the policy making process. This thesis has also shown the effect of politics on public health in the medieval period. It has shown that just as politics is important

today on public health, it was the same in medieval times by studying the most powerful State in that period.

The research has also shown resemblance on the policies and infrastructure of health care in the Islamic Caliphate and the modern day Western world especially in social welfare states that attempt to apply the principles of the Ottawa Charter. It provides a framework of policy developments and their effects in very similar situations and could be useful in modern times to study the effect of policies in the 21st century and their potential effect by going back historically. It is hoped that lessons can be learned from the policies that had deleterious effect on the population and that these policies should certainly be abandoned in modern times as they are likely to yield the same adverse effects.

Finally the thesis has attempted to bridge a six hundred year gap of public health history that has not been hitherto studied by Western historians of public health. It provides the bridge of history from the dark ages of Europe till the Renaissance period.

9.4.2 Limitations of the Research:

It was not possible to consult all the historical chronicles of that era. This thesis has relied only on the well-known ones. There are however a large amount of historical chronicles dating back to that era and it may be possible that more data is actually available than is described in this thesis.

As previously mentioned, the research student is an Arab and a Muslim. The possibility of researcher bias is ever present and though the student has at all stages exercised the concept of reflexivity, there is still the possibility of bias especially in the interpretation of historical data. This however is a weakness of any historical research and not just exclusive to this thesis. The interpretation of any historical narrative is usually subject to the researcher.

The historical narratives and chronicles dating back to the medieval period are not without their own limitations. Whilst the science of authentication had started early in the medieval period, the accuracy of these chronicles is certainly not absolute.

This thesis combines the methodology of historical research with that of public health. This has on many occasions in this thesis been very difficult to combine. In some instances, they were incompatible to present the research and in these instances, the historical narrative had to be presented first prior to the modern health care analysis. It was difficult in these instances to continue a coherent streamlined presentation of the data and a large amount of "experimentation" of data and analytical presentation had to be made before deciding on the best or most appropriate form. It has been particularly helpful to have two supervisors – one who is a public health expert and the other an expert in historical methods. However, the decision of the best presentation format is still subjective.

The actual analysis using modern day scenarios that were similar to the scenarios presented in the historical data was also based on the subjective choice of the researcher. Whilst the supervisors did agree with the analytical choices presented in the thesis, they still remain subjective and there is no way of guaranteeing that the historical scenarios and the modern day scenarios were exactly the same – but this is a problem with any research of this nature that is dependent on historical sources from a medieval period.

9.5 Further research:

This research has concentrated only on the three caliphates that existed over the six hundred year period. This research has not included the two hundred and sixty two year period of the Fatimid dynasty as it was out with the boundaries of this thesis. In addition, Andalusia was completely excluded from this research as after the fall of the Ummayad Caliphate, it ceased to be part of the Abbasid State.

The Caliphate of Cordoba was indeed a seat of great learning and scientific activity and matched Baghdad as a centre of learning. There are many writings regarding the scientific achievements of the Andalusian era of the Muslims. Yet more research is needed to identify the policies that affected public health through the social determinants of health and to place these in a modern day context of public health understanding. Such a research will be informative and may even help in providing more insight into the European Renaissance as Muslim Spain was indeed the gateway to Europe. Furthermore, the fall of Cordoba happened in 1495CE, more than two centuries after the fall of the Abbasid Caliphate. The effect on the fall of the Abbasid Caliphate on Andalusia and its subsequent effects on public health in that region remain to be examined.

The Ottoman Caliphate was a major force at its peak. Yet again, whilst many writings exist on the medical achievements of this era, no research has been done to place these in the context of the welfare State. The development of the welfare system in the Ottoman Caliphate and its effects on the health of the population using modern day insights has not been studied.

It is hoped that this thesis would stimulate further research into these Muslim eras. Indeed with the collapse of the Ottoman Caliphate in 1924CE, the rise of national governments and various dynasties in the Muslim East have remained with us till this day. Despite the medical advancements and the spread of hospitals, a large part of the Muslim world remains in poorer health when compared with their Western counterparts – the complete opposite of the situation over a millennium ago according to the data provided by Conrad (Conrad, 1995).

The reasons for the present state of health of much of the population in the Muslim world with the exemption of the very rich small Gulf nations are the lack of optimisation of the social determinants of health, the lack of strong and transparent leadership and the rise in

corruption. These factors were tackled effectively in the era of the Righteous Four. Further research is needed on how the policies could be changed to improve the health of the majority of the Muslim world today.

Finally, was the Islamic Caliphate the first ever State that applied a highly sophisticated welfare system that incorporated all the social determinants of health as they are known today in the modern world? It is clear that the Caliphate's attention to the welfare system was born out of the religion of Islam that instructed the establishment of this system. It was clear that the welfare system thrived when the rulers displayed high moral and religious standards in addition to a high level of social justice and equity.

Long before the era of the Prophet Muhammad and the Righteous Four, the Kingdom of Ancient Israel was ruled by at least two well – known righteous Kings, David and Solomon who ruled at an approximate period between 1010BC and 930BC. These Kings were well known for their religious piety. King David is held as a Prophet by all three religions – Judaism, Christianity and Islam. King Solomon is accepted as a wise man by all three religions and Islam holds King Solomon as a Prophet as well. Indeed all historical data regarding King Solomon provide the picture of a very rich King ruling a large expanse of land under the Kingdom of Israel. Israel under King Solomon was also a very powerful nation. Thus we do have historical data of two powerful and righteous Kings who ruled an otherwise very rich nation. Did these Kings provide for their people a welfare system? How did it look like? What were their policies? What was the effect of their policies on public health? Further research is required to assess the health care policies and the social determinants of health in the Kingdom of Ancient Israel.

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