

QATAR UNIVERSITY

COLLEGE OF HEALTH SCIENCE

THE EFFECT OF THE BLOCKADE ON GOVERNMENTAL HEALTH-CARE SERVICES IN

QATAR

BY

MASHAEL ALI AL-BADR

A Project Submitted to  
the Faculty of the College of Health  
Science  
in Partial Fulfillment  
of the Requirements  
for the Degree of  
Masters of Science  
in  
Biomedical Sciences

June 2018

© Mashaël Ali Al-Badr. All Rights Reserved.

## COMMITTEE PAGE

The members of the Committee approve the project of Mashael Ali Al-Badr

---

Dr. Pejman Hanifi Moghaddam  
Thesis/Dissertation Supervisor

---

Dr. Nader Al-Dewik  
Committee Member

---

Dr. Belaid Aouni  
Committee Member

## ABSTRACT

Al-Badr Masha'el Masters of Science: June : 2018, Biomedical Sciences

Title: The Effect of the Blockade on Governmental Health-Care Services in Qatar

Supervisor of Project: Dr. Pejman Hanifi Moghaddam

.

**Problem:** A good portion of the budget dedicated to the health-care sector every year for laboratory and pharmacy services is spent on patient care, instruments and equipment, medication, software, facilities, and so on. Almost all of these are imported at high cost. The blockade of Qatar seems to affect the health-care system by affecting the internal operations and other services.

**Aims:** This study aims to highlight the factors affecting laboratory and pharmacy services during the blockade. Its purpose is also to reveal the weaknesses that are influencing the internal operations of pharmacies and laboratories. The overall goal is to make recommendations that could improve Qatar's economic competitiveness in relation to the health sector and not the hydrocarbon industry with or without the blockade.

**Methodology:** Qualitative methods are used such as a series of literature reviews because the blockade figures are confidential.

**Finding:** The blockade had limited impact on the health care expenditure internal in Qatar. Combined with the low inflation rate and increase levels of import for the pharmaceutical supplies, it seems that the quality and scope of the health care service was not affected. By embargo.

## DEDICATION

*This thesis is dedicated to:*

*The sake of Allah My Creator and My Master*

*My homeland Qatar*

*My family, for supporting me in countless ways*

## ACKNOWLEDGMENTS

First and foremost, I must acknowledge my limitless thanks to Allah for his help and blessings.

I am grateful to my family for their generous and unlimited support before and during my study and thesis preparation.

I would like to express my warm thanks to my supervisors Dr. Pejman Hanifi Moghaddam, Dr. Nader Al-Dewik, and Professor Belaid Aouni for their patience and support.

I owe a deep debt of gratitude to my colleagues at Qatar University. I would not have completed my thesis without their support.

## TABLE OF CONTENTS

DEDICATION .....	iv
ACKNOWLEDGMENTS .....	v
LIST OF FIGURES .....	viii
CHAPTER 1: INTRODUCTION .....	1
1.1- Background.....	1
1.2- Aim of this Study.....	3
1.3- Research Question.....	3
CHAPTER 2: BACKGROUND .....	4
2. 1- State of Qatar .....	4
2. 2- Safety and Security in Qatar .....	5
2. 3- Sport in Qatar .....	6
2. 4- The Health Care System in Qatar .....	7
2. 4. 1- The HMC: Hamed Medical Cooperation .....	8
2. 4. 2- The PHCC: Primary Health Care Corporation .....	9
2. 4. 3- Sidra Medicine .....	10
2. 5- Factors that Could Disrupt Public Health .....	11
2. 6- Natural catastrophes and their Impact on Public Health .....	12
2.6.1- Earthquakes and Volcano interruption .....	12
2.6.2- Impact on health-care system.....	14
2. 7- Man-made Unrest and its Impact on Public Health .....	14
2. 7. 1- Civil War .....	14
2. 7. 2- Embargos and Blockades.....	15
2.7.3- Impact on health-care system.....	15
2. 8.- Selected cases of Embargo and Blockade .....	16
2.8.1- US embargo on Cuba.....	16
2.8.2- The effect on Cuba health care and the research field.....	17
2.8.3- Indian embargo on Nepal.....	17
2.8.4- The effect on Nepal health care.....	18
2.8.5- Israel's blockade of Gaza .....	18
2.8.6- Health-care impact.....	19
2.8.7- Other countries .....	19
CHAPTER 3: METHODOLOGY.....	21
CHAPTER 4: RESULTS .....	22
4. 1- Data Collections.....	23
4.2- Qatar Blockade .....	23
4.3- Qatari Import and Export Movements before the Blockade .....	24

4.3 - Imports and Exports after the Blockade .....	25
4.4 - Qatar and the population health .....	31
4.5 Health Expenditure.....	36
4. 5- Effect on Medical Supply Chain Management and Logistics Services .....	38
4. 6- Effect on Contractual Management.....	39
4. 7- Effect on Private Medical Suppliers .....	40
4. 9- Effect on health infrastructure.....	40
CHAPTER 5: DISCUSSION AND RECOMMENDATIONS.....	42
5. 1- Discussion .....	42
5. 2- Recommendations .....	42
REFERENCES .....	44

## LIST OF FIGURES

<b>FIGURE 1: MAP OF GCC COUNTRIES</b> .....	5
<b>FIGURE 2: MAIN HEALTH-CARE PROVIDERS IN QATAR</b> .....	7
<b>FIGURE 3: MAIN HOSPITAL AND RESEARCH CENTERS MANAGED BY THE HMC</b> .....	8
<b>FIGURE 4: HEALTH-CARE CENTERS IN QATAR MANAGED BY THE PHCC</b> .....	10
<b>FIGURE 5: ECONOMIC IMPLICATIONS OF NATURAL CATASTROPHES AND MAN-MADE DISASTERS IN 2015–2017</b> .....	12
<b>FIGURE 6: THE WORLD’S COSTLIEST VOLCANIC ERUPTIONS FROM 1980–2015</b> .....	13
<b>FIGURE 7: SOME MAJOR WESTERN SANCTIONS IMPOSED ON OTHER COUNTRIES WORLDWIDE</b> .....	20
<b>FIGURE 8: MAIN SEAPORTS IN GCC AND IRAN</b> .....	25
<b>FIGURE 9: QATAR WORLD IMPORTS FROM MARCH 2013 TO MARCH 2018. THE SHADED AREA IS THE PERIOD UNDER EMBARGO</b> .....	27
<b>FIGURE 10: QATAR WORLD IMPORTS FROM JAN 2017 TO MARCH 2018. THE SHADED AREA IS THE PERIOD UNDER EMBARGO</b> .....	27
<b>FIGURE 11: QATAR IMPORT FROM EU 2007 TO 2017</b> .....	28
<b>FIGURE 12: QATAR PHARMACEUTICALS IMPORT FROM 2014 TO 2017</b> .....	29
<b>FIGURE 13: QATAR PHARMACEUTICALS IMPORT FROM 2013 TO 2017</b> .....	29
<b>FIGURE 14: QATAR PHARMACEUTICALS IMPORT FROM JUNE TO NOV 2017</b> .....	30
<b>FIGURE 15 CONTRIBUTION OF TRADING PARTNERS TO INCREASE OF QATAR PHARMACEUTICALS IMPORT IN YEAR 2017 COMPARE TO 2016</b> .....	31
<b>FIGURE 16: POPULATION ESTIMATES FROM JANUARY 2017 TO 2018</b> .....	32
<b>FIGURE 17: LIVE BIRTH COUNT FROM JANUARY 2017 TO 2018</b> .....	32
<b>FIGURE 18: NUMBER OF DEATH FROM JANUARY 2017 TO 2018</b> .....	33
<b>FIGURE 19: LIFE EXPECTANCY INDEX FOR ALL GCC COUNTRIES IN 2015</b> .....	34
<b>FIGURE 20: ADULT FEMALE MORTALITY RATE PER 1000 PEOPLE IN GCC COUNTRIES</b> ....	35
<b>FIGURE 21: ADULT MALE MORTALITY RATE PER 1000 PEOPLE IN GCC COUNTRIES</b> .....	35



**FIGURE 22:** QATAR ANNUAL HEALTH EXPENDITURE FROM 2010 TO Q1 OF 2018. THE PER  
CAPITAL EXPENDITURE ARE CORRECTED FOR THE INFLATION RATE. .... 36

**FIGURE 23:** MONTHLY INFLATION RATE FROM BETWEEN FEBRUARY 2015 TO APRIL 2018  
..... 37

## CHAPTER 1: INTRODUCTION

### 1.1- Background

Health-care providers rely on laboratory and pharmacy services to cover the upstream and downstream flow of health care services. The first one offers diagnostic tools for diagnosis and prognosis and the second one for the dispensation of medication to those that need them. Thus, any disturbance in one or both of the services would render the service ineffective and therefore have a devastating effect on the scope and quality of the assistance a health-care organization intends to provide. The biggest challenge faced by decision-makers, when establishing reliable and yet cost-effective health-care provision, is to build laboratory and pharmacy services in such a way that would not only serve the community during periods of calm and peace but also would be robust enough to remain functional during times of natural and man-made disasters. Health care system in the developing country dates back to the 19th century, when Germany introduced *Sickness Insurance Law* in 1883 followed by United Kingdom with universal Health Care Act introduced in 1911 [1, 2].

Qatar is a young country compared with other ancient countries in the Middle East[3]. It gained its independence in 1971. Hamad Medical Corporation (HMC) was established eight years later by a decree from the Emir of Qatar in 1979 [4]. The residents in Qatar enjoy universal health-care services supported by a mandatory health insurance system that was made into law in 2013 [5]. While the Qatari government pays for Qatari citizens and their non-Qatari spouses, companies and sponsors are responsible for paying the premiums for their employees and family members respectively. [6]

The health care sector and its services has grown rapidly in Qatar during the past few years. According to GCC healthcare industry report, Qatar had a growth rate of 14% over the period (2013-18), which made Qatar the fastest growing healthcare market in GCC [7]. The Ministry of Public Health (MOPH) in Qatar oversees and manages the development of the Qatari population's health. In order to achieve such goals, the Hamad Medical Corporation (HMC), opened seven new hospitals [8]. It plans to bring the total number of the hospitals to 12 in 2020 from current 10 to serve 2.8 millions of inhabitants {(HMC), 2018 #35. Furthermore, the Primary Health Care Corporation (PHCC) announced to open four new health-care centers this year [9]. The expansion of health facilities seems to cover the most needs of Qatar.

These well-established health care service infrastructures in the western and developing countries offers them a reliable and robust service that draws from years of lessons-learned, integrated and strong research and development, in-house expertise. However, other countries, such as Qatar, situated in a turbulent region, stablishing an effective health care system seems to be easier than maintaining a robust one. One may need a crystal ball in order to look into others' minds and plan for the present by investigating the future.

On June 5, 2017, the Kingdom of Saudi Arabia (KSA), the United Arab Emirates (UAE), Bahrain, and Egypt imposed a blockade on Qatar. Three of these countries are GCC neighbors. The borders have been closed, trade has been stopped, land and airspace was blocked and many shipments was prevented from entering Qatar. However, effect of the blockade on health-care operations is yet to be determined.

## **1.2- Aim of this Study**

Because of the recent event, and the lack of primary data, we resorted to the secondary data and indicators, extracted from the public databases to study the overall effect of the blockade on the health care system in Qatar. For this study, we assumed that a direct relationship between the expenditure and the quality of the health care services. This underlying assumption rests on the known fact that any disruption in funding of internal operations would have a direct effect on the quality of the health care services.

This study aimed to identify the major and important factors of the healthcare services that are influenced by blockade, civil war or natural disaster through a comparative review of the similar instances around the world. It also aims to reveal the weaknesses that affect the internal operations of pharmacies and laboratories. The overall goal is to make recommendations that could improve Qatar's economic competitiveness in relation to the health sector and not the hydrocarbon industry.

## **1.3- Research Question**

Was there any effect of the Blockade on Governmental Health-Care Services in Qatar?

## CHAPTER 2: BACKGROUND

### **2. 1- State of Qatar**

Qatar is a peninsula located in the Arabian Gulf (also called the Persian Gulf) in Southeast Asia. The capital city is Doha, which is located on the east coast of the country. Qatar covers an area of approximately 11, 427 square km and is surrounded by the waters of the Gulf on all sides except the one that connects it to the KSA. The population count at the end of 2017 was 2, 641, 669 [10]. The main religion in Qatar is Islam and the main language is Arabic. Before the discovery of oil and gas, Qataris were divided into Bedouin (people who live in the desert) and Hathar (people who live on the coastal areas). The economy depended on pearl diving, fishing, hunting, and trading. Then oil was discovered in Dukan-Qatar in 1939 [11]. This discovery led to a significant change in Qatar's economic status. Natural gas was then discovered and has made Qatar the fourth largest natural gas producer behind the United States (US), Russia, and Iran with an estimated 4. 6% of total global production [12].

In 1968, there was an announcement from Britain that it would withdraw its military existence from the Gulf. Three years later, Qatar announced the independence on September 3, 1971[13]. Qatar is part of the GCC, whose countries are also Kuwait, Oman, the KSA, the UAE, and Bahrain (see Figure 1).



Figure 1: Map of GCC countries

**2. 2- Safety and Security in Qatar**

Qatar is a safe place to live compared to other country. According to the Golden Visa 2015 World Safety Index, Qatar was ranked as the second safest country in the world in 2015. Moreover, in the same year it was ranked as the second most stable country in the Middle East according to the Fragile States Index [14].

In 2017, Qatar's global rankings in terms of security indexes were as follows: the least expensive country in terms of the cost of operations related to crime and violence; a country free from terrorism; the ninth highest country in terms of fighting organized crime; and the sixth highest country in terms of public satisfaction with, and confidence in, the service provided by police [15].

### **2. 3- Sport in Qatar**

Since Qatar is an Arabic country and most of its land is desert, Qataris' traditional sports are Arabian horse racing, camel racing, and falconry, all of which suit the environment. However, Qataris also have a passion for worldwide sports, especially football [16]. This passion means that sports have received special attention from the government. Following the rapid development of its infrastructure, Qatar has been able to host global sporting activities. For example, in 2006 Qatar organized the 15th Asian Games, Asia's Olympic-style sporting event [16]. Moreover, Qatar will host for the first time in the Middle Eastern the 17<sup>th</sup> World Championships in Athletics in 2019, the Fédération Internationale de Football Association (FIFA) World Cup in 2022, and the Fédération Internationale de Natation (FINA) World Swimming Championships in 2023 [14].

## 2. 4- The Health Care System in Qatar

The Qatari government offers free health care for all its citizen. Health care in Qatar was ranked as the thirteenth best in the world and ranked the best in the Middle East in 2017/18[17]. The Ministry of Public Health (MOPH) is the health-care regulator in Qatar and oversees public and private health-care providers.

In 1957, the first hospital in Qatar, the Rumailah Hospital, was opened. Today, this hospital is part of the Hamed Medical Cooperation (HMC) [18]. In 1979, the Hamad General Hospital was established. From then, the health-care sector in Qatar started to develop.

In the public sector, there are three main health-care providers: The Primary Health Care Corporation (PHCC), the HMC, and Sidra Medicine. There are also many other private hospital and clinics that compete with the public sector in terms of quality of the service.

Figure 2 shows the main health-care providers in Qatar.

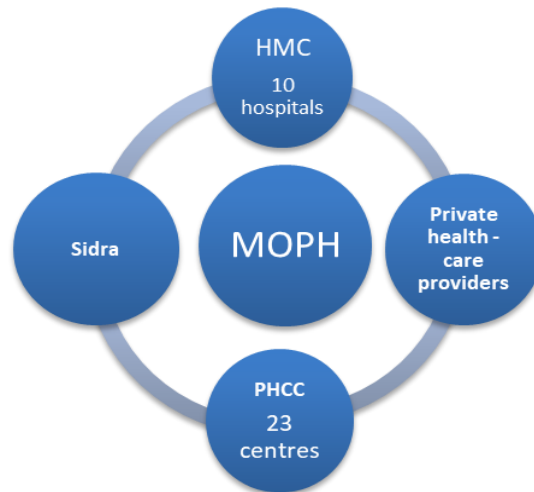
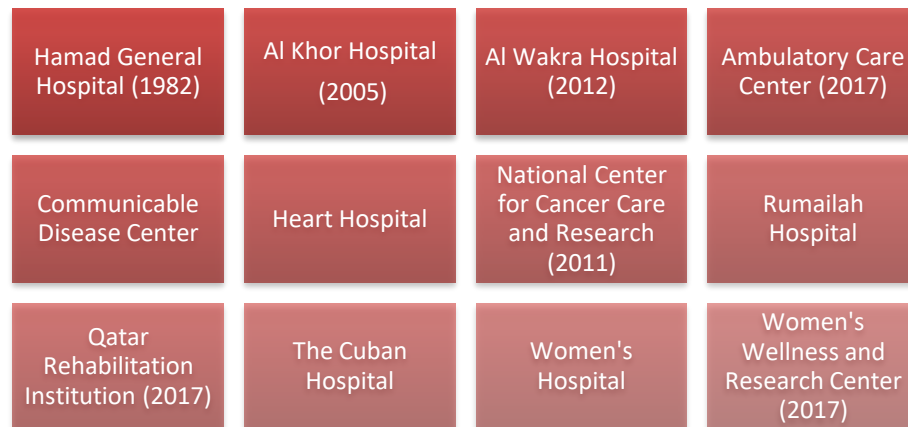


Figure 2: Main health-care providers in Qatar



### 2. 4. 1- The HMC: Hamed Medical Cooperation

The HMC is a nonprofit health-care organization founded in 1979 by *Emiri decree*. It is the largest health-care provider in Qatar and, currently, manages more than 10 hospitals and research centers in different locations [19] (see Figure 3) .



Hamad General Hospital (1982)	Al Khor Hospital (2005)	Al Wakra Hospital (2012)	Ambulatory Care Center (2017)
Communicable Disease Center	Heart Hospital	National Center for Cancer Care and Research (2011)	Rumailah Hospital
Qatar Rehabilitation Institution (2017)	The Cuban Hospital	Women's Hospital	Women's Wellness and Research Center (2017)

Figure 3: Main hospitals and research centers managed by the HMC

The HMC plays a dominant role in terms of secondary and tertiary health care in Qatar. In 2007, HMC facilities were accredited by the international branch of the Joint Commission, the US-based organization that oversees the accreditation of hospitals worldwide [18]. It was also the first medical organization system in the region to achieve institutional accreditation by ACGME-I (Accreditation Council for Graduate Medical Education-International) [18].

#### **2. 4. 2- The PHCC: Primary Health Care Corporation**

The PHCC began as a department inside HMC. It then became an independent corporation in 2013. Today, the PHCC supervises 23 health-care centers distributed around Qatar ( see Figure 4) , providing primary health care through several clinics and services to both Qatari and non-Qatari people [20].

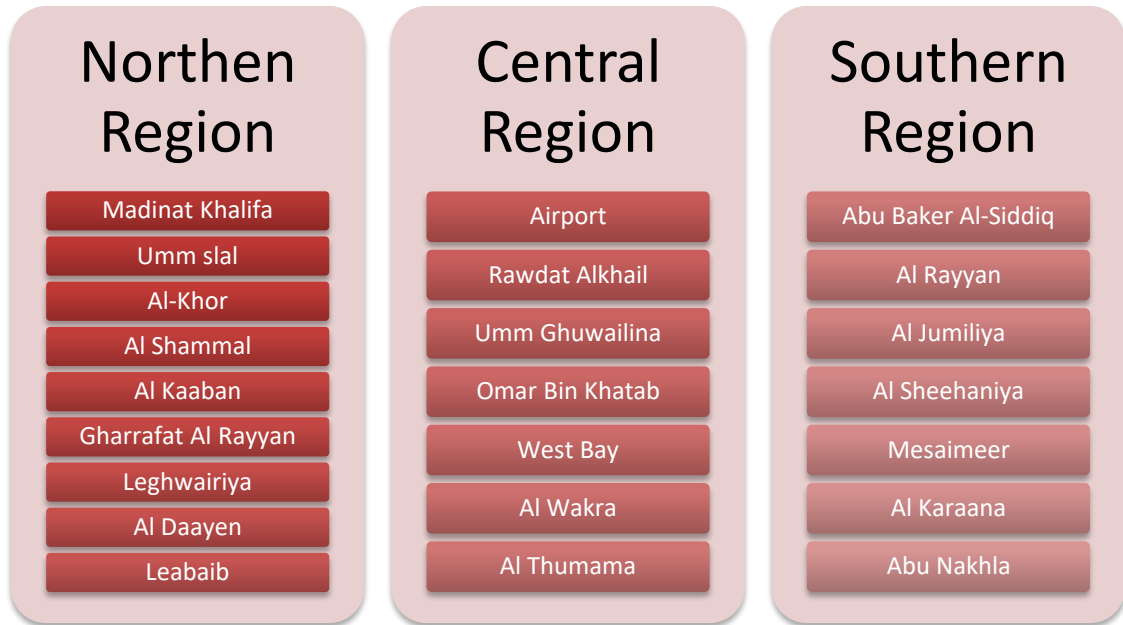


Figure 4: Health-care centers in Qatar managed by the PHCC

### 2. 4. 3- Sidra Medicine

Sidra Medicine is a medical center that takes care of women, children, and young people of national and international origins. Sidra Medicine, and its research center, aim to help build Qatar’s scientific expertise and resources. It also cooperates with many academic and health-care institutes in Qatar such as Weill Cornell Medical College and the HMC in order to deliver the best health care for inpatients and outpatients [18].

## **2. 5- Factors that Could Disrupt Public Health**

Several factors may disrupt public health. Two major ones are natural disasters, such as earthquakes, volcano interruption, flood, tsunami, tornado (also known as cyclone and typhoon) or man-made unrest such as wars, including foreign invasion, and civil wars, embargos, and blockages. Despite diverse factors causing these, natural and man-made, disruption of our normal life, they all also have some commonalities in terms of their impact on economy and health. Paralyzing the health sector can lead to deaths in the worst instances. Aside from huge human cost, these events can have long lasting negative effect on the generation to come by weakening the economy and destabilizing countries. For example, natural disasters and man-made catastrophes cost global economy 337 billions of US dollars in 2017 alone. In the same year , more than 11,000 people died or reported as missing [21]. Such disasters negatively affected country's budgets and damaged infrastructures, personnel, and information.

With regard to economic effects, the burden placed on governmental resilience is very costly in the short and long terms. This situation may cause significant budgetary pressures, especially when an infrastructure is lost. Figure 5 presents the economic implications of natural catastrophes and man-made disasters during 2015–2017 [21-23].

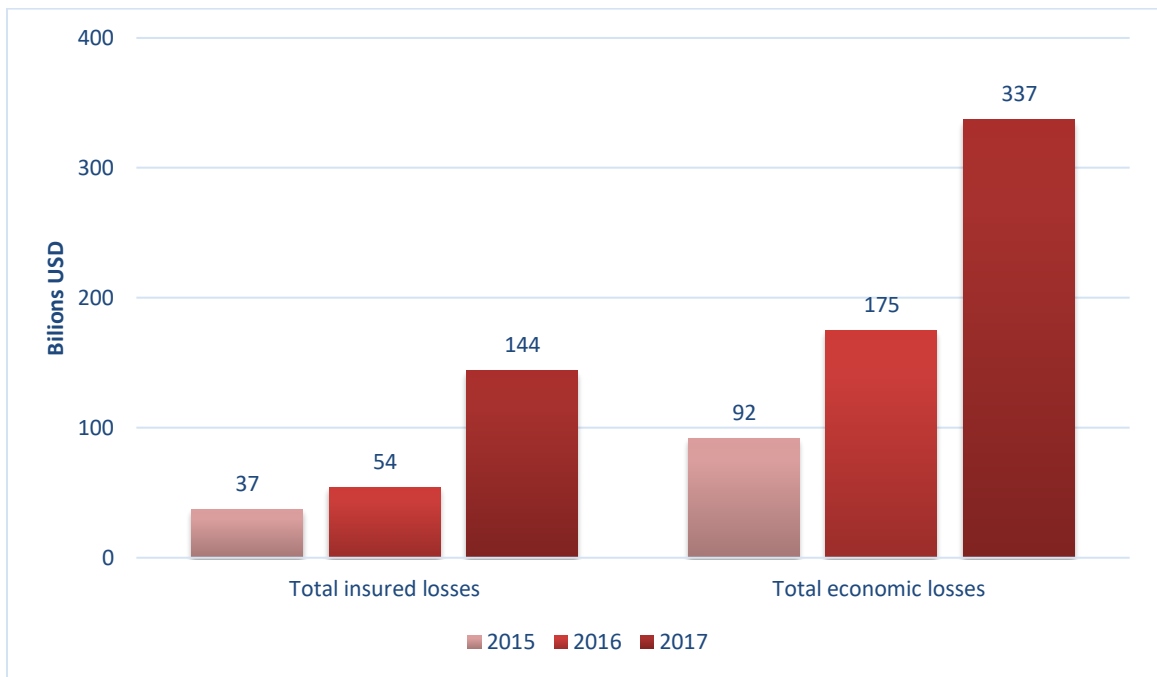


Figure 5: Economic implications of natural catastrophes and man-made disasters in 2015–2017.

## 2. 6- Natural catastrophes and their Impact on Public Health

### 2.6.1- Earthquakes and Volcano interruption

According to the World Health Organization (WHO) , earthquakes usually have compound hazards such as fire, landslides, and tsunamis [24]. An earthquake's implications depend on its magnitude and the severity of its consequences. In 2011, a nine-magnitude

earthquake hit Japan, followed by a severe tsunami. In total, 28,000 people were killed or went missing. Later, the tsunami's waves reached the Fukushima nuclear power plant and caused a radioactive leak. The triple disaster had an economic cost of US\$360 billion [25]. Because there are approximately 500 active volcanoes worldwide, the risk of volcanic eruptions is always present [26]. The eruption of a volcano can have secondary consequences such as earthquakes, tsunamis, the release of gases and steam, fires, and landslides. According to the International Disaster Database, Nevado Del Ruiz in Colombia in 1985 had the most severe economic impact, estimated at US\$1 billion. Approximately 20,000 people were killed. Figure 6 shows the world's costliest volcanic eruptions from 1980–2015.

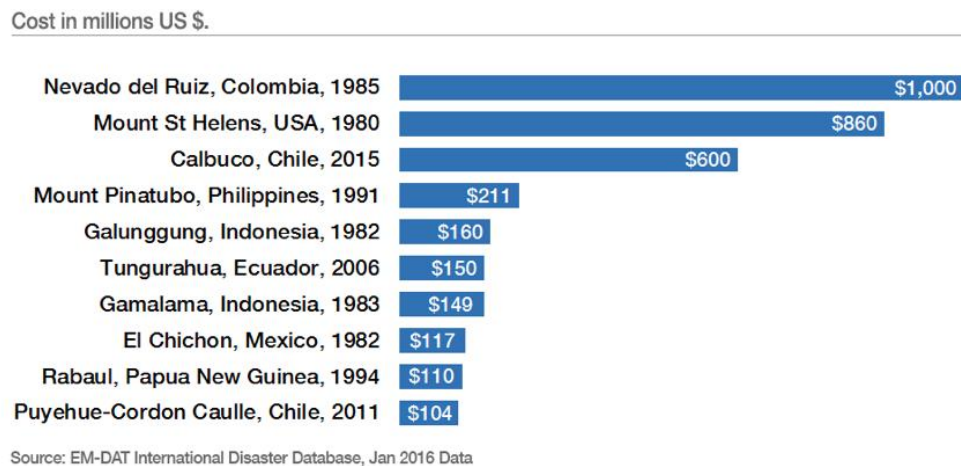


Figure 6: The world's costliest volcanic eruptions from 1980–2015.

### **2.6.2- Impact on health-care system**

Depending on a disaster's severity, the impact can be classified in terms of public health and health care services. The health impact can be injuries that could lead to death at the disaster site or in hospital. The implications for public health are the paralysis of the health-care system or its services, especially if a hospital building collapses, roads, communication infrastructures, air or sea ports are damaged and the access to the side is blocked or severely damaged [24]. Moreover, aftermath fires, electrical failures, and lack of clean water could also lead to loss of health and disrupt the care services.

## **2. 7- Man-made Unrest and its Impact on Public Health**

### **2. 7. 1- Civil War**

Violent civil wars have destructive implications in the short and long terms, especially if the effects reach health-system infrastructures and services. Besides loss of life, civil wars destroy the infrastructure, drains the country from cash and human resources. A civil war is expensive; for example, in Syria the total economic loss caused by the civil war is calculated at approximately 255 billion euros [27]. This is in addition to the emigration of the highly qualified health care providers that rendered many hospitals no functional.

### **2.7.2- Embargos and Blockades**

According to the Cambridge dictionary, an embargo is defined as “an official stop to trading with another country” [28]. A blockade is defined as “an act using force or the threat of force to stop the movement of people or goods into or out of a country or area, or the people or objects used to prevent such movement” [29]. However, it seems that the long-term effect of the embargos and blockades on the health-care systems is not clear, as it could have a negative or even positive effect. For example, the blockade of Cuba by the US had cost Cubans approximately US\$685 million annually(5% of total budget) compare to US\$ 4.2 billion annually for USA (less than 0.1 % of total budget) [30]. However, this helped Cuban to build a strong pharmaceutical industry in their country and a health care system that was hailed by Ban Ki-moon as “a model for many countries”.

### **2.7.3- Impact on health-care system**

The direct impact of civil conflicts is injury leading to death. With regard to blockades, the shortage of supplies may also lead to death. The impact on a health-care system depends on the severity of a conflict. A reduction in supplies, scarcity of food, and loss of fuel are the obvious impacts. Civil wars sometimes also lead to the loss of a hospital, its services, staff, and instruments.



## **2. 8.- Selected cases of Embargo and Blockade**

### ***2.8.1- US embargo on Cuba***

José Santiago, the digital editor of the World Economic Forum, explains in a time line the detail of the US embargo on Cuba from 1960 to 2017.

In 1960, the US blocked almost all exports to Cuba, except food and medicine, and froze all Cuban assets inside the US. This action was taken after Cuba decided to nationalize American-owned Cuban oil refineries without compensation.

In 1962, the US imposed a complete embargo on Cuba. This economic embargo paralyzed trade, which affected Cuba significantly because it depended to a great extent on American products.

The complete embargo lasted until 1998 when the US government allowed humanitarian shipments (food and medicine) to enter Cuba. The next change was in 2009 when president Obama lifted the travel restriction for educational and religious purposes. He also allowed some companies to pursue business opportunities. After Cuba agreed to release 53 political prisoners in 2014, the US agreed to restore a diplomatic agreement with Cuba. This agreement enabled the economic recovery of the island to accelerate. The following year, Cuba and the US restored the diplomatic relations that had been cut in 1960 (for 55 years) . In the same year, both countries signed an agreement to resume commercial air travel. In June 2017, President Donald Trump announced a partial rollback of the agreement signed between US and Cuba, 15 months earlier[31].

### ***2.8.2- The effect on Cuba health care and the research field***

Because most Cuban imported products came from the US at the time of the embargo, the health-care sector was affected to an extreme extent. Cubans faced a shortage of medical supplies, textbooks, drugs, and instruments. However, hospitals were full of qualified physicians whose services were free for everyone [32].

Despite all the difficulties that faced Cuba's health-care system, its researchers engaged in world-class medical work on vaccines and preventive medicines. The government supported scientists, enabling the latter to turn pure science into applications that benefited the whole world. The governmental investment in scientists, mainly in the biotechnology field, was aimed to improve the population's health and help socioeconomic development at the same time. Accordingly, the government established the National Center for Scientific Research (Spanish acronym: CNIC) [33].

### ***2.8.3- Indian embargo on Nepal***

Unfortunately, 2015 was not a good year for the Nepalese. In April–May, the country faced devastating earthquakes followed by an economic and un-humanitarian embargo imposed by its neighbor, India, on September 23. The complete closure of the border was not the first time that this had occurred. In 1990, India also closed the border and initiated an embargo that lasted for a year and a half. The embargo that began in 2015 lasted until early

February 2016. During this period, Nepal faced severe shortages of oil and gas, medicine, food, and other life-essential products.

#### ***2.8.4- The effect on Nepal health care***

Prior to the embargo, the health-care system in Nepal was affected by earthquakes that occurred in April and May, 2015. The system had not fully recovered when the second crisis, the embargo, began. Because Nepal receives nearly 60% of its imports ( includes drug and health products) from India, it affected severely citizens' lives and health [34].

India prevented the dispatch of supplies that included medicine and food. This situation led to severe shortages and consequently significant damage to Nepal's health-care system. many of public health programs were affected (example: vaccination) [34]. The United Nations Children's Fund (UNICEF) warned that due to the acute shortage life essential supplies, about three million children under the age of five were threatened with death or diseases [35].

#### ***2.8.5- Israel's blockade of Gaza***

The conflict between Israel and Palestine not new. It has endured through several centuries and is not yet resolved. The land has faced few periods of peace and war phases over the

years. In 2006, Israel blockaded the Gaza Strip in Palestine by air, sea, and land. Egypt opened the Rafah crossing, but the movement of people and supplies was limited [36]. The Gaza Strip also faced an attack in late 2008 to early 2009. This attack is considered the harshest military assault on the Gaza Strip since 1976 [36].

#### ***2.8.6- Health-care impact***

The people of the Gaza Strip suffered physically and psychologically on a wide-ranging scale [36]. According to the United Nations, “one third of hospitals, 14 primary healthcare clinics and 29 Palestinian Red Crescent and Ministry of Health ambulances were damaged” [37]. The remaining health-care facilities were struggling and faced shortages in medical supplies and electricity.

#### ***2.8.7- Other countries***

Many other countries have faced similar situations of blockades, embargos, and sanctions such as Iran, Myanmar, North Korea, and Somalia. Some of these countries have lived through embargos imposed by a neighboring country while others have suffered sanctions from a country that is not even on the same continent (see Figure 7).

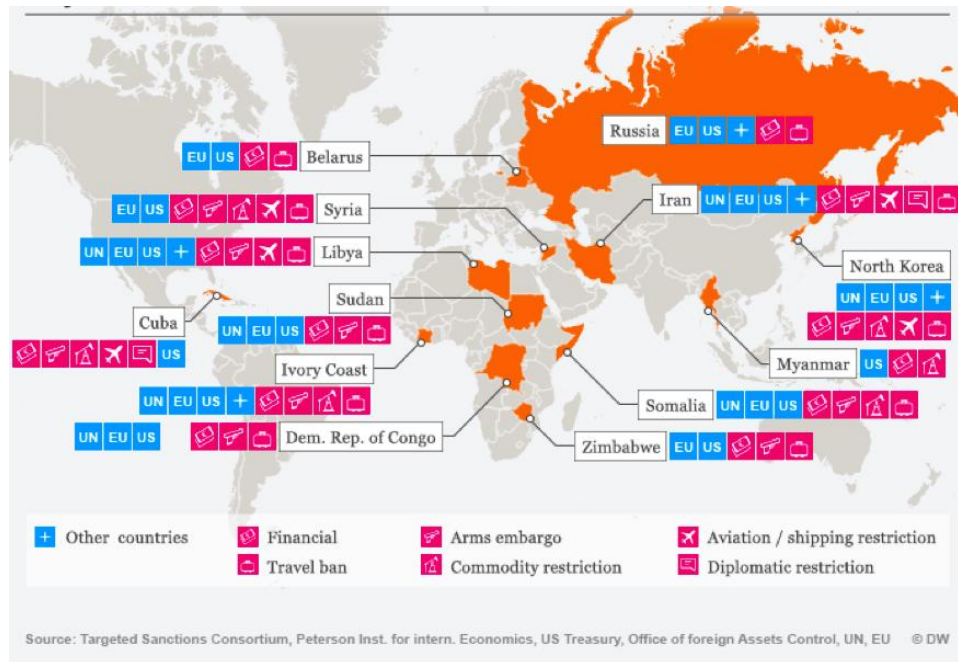


Figure 7: Some major Western sanctions imposed on other countries worldwide

## CHAPTER 3: METHODOLOGY

To study the overall effect of the blockade on the health care system in Qatar and due to inability to access primary data, we used indicators and data extracted from governmental, international databases and local newspapers, that are available to general public. We extracted the data, wherever possible from its primary sources and, if not available did comparisons between at least two sources to ensure its integrity and accuracy. For this study, we assumed a direct relationship between the expenditure and the quality of the health care services. We made this assumption based on the review of historical data from the situations that would closely mimic or resemble the current blockage in Qatar. One of the main indicator chosen for this study was to look at the changes in the health care expenditure, inflation, birth and death rate. We argued that any negative effect would be reflected in the ability of the government to fund its internal operations at the cost of increase of its military spending. We argued that any decrease in health care expenditure would negatively affect the quality of the health care services.

This study aimed to identify the major and important factors of the healthcare services that are influenced by blockade, civil war or natural disaster through a comparative review of the similar instances around the world. It also aims to reveal the weaknesses that affect the internal operations of pharmacies and laboratories. The overall goal is to make recommendations that could improve Qatar's economic competitiveness in relation to the health sector and not the hydrocarbon industry.

## CHAPTER 4: RESULTS

The Qatar blockade by neighboring countries was unexpected. The prevention of trade and the element of surprise could have paralyzed the entire health sector. However, because of the government's wisdom and immediate response, the blockade's negative effect on laboratory and pharmacy services has been limited. A disaster management plan was successfully activated and many committees have been created to facilitate cooperation between the government and the private sector throughout the economy. As part of the management of the crisis, the MOPH controls and directs the situation in the health sector. An ad hoc committee has also been formed to facilitate cooperation between health-care providers and private sector suppliers and distributors. The aim of this cooperation is to ensure that citizens are not affected by any shortage and are not dissatisfied by any health-care services because of the blockade. The government also aims to identify and trace the reasons for any shortages that people may face, address problems with local/regional distributors, cancel contracts with non-responsive agencies, and find suitable alternatives as quickly as possible.

#### **4. 1- Data Collections**

Data collection was the hardest part of this study. The original plan was to use quantitative data to compare the situation before and after the blockade. However, because of sensitivity and confidentiality associated with data, we decided to use other indicators that were publicly available and deduct the effect of the embargo with regard to prices and the subject's sensitivity and security, a qualitative method was chosen instead.

We collected data from daily newspapers and online and data presented in the local workshops and seminars. We used looked and tried to identify similar scenarios that impacted the health of a populations. Literature reviews are undertaken to form a better idea about the subject. Such reviews also help to determine the factors that affect the problem in order to solve it or identifying any missing parts. Data from online textbooks, journals, and newspapers were collected, classified, and analyzed as required. In addition, lectures about the Qatar blockade were attended. The lectures were held in Qatar University and were very informative because they provided up-to-date information.

#### **4.2- Qatar Blockade**

On June 5, 2017, Untitled Arab Emirate, Saudi Arabia and Bahrain and Egypt cut their diplomatic and economic ties with Qatar. In addition, they imposed an embargo to prevent Qatar from importing, exporting goods and transferring money. All the land connection to Saudi Arabia was blocked, the airspace closed and sea port at Jabel Ali in UAE (the main intermediate port for receiving goods for Qatar) became in accessible. [38].



Considering the dependency of Qatar on goods imported via its only land corridor with Saudi Arabia and Jabel Ali, anticipated negative impact was huge. In the health sector, the majority of international companies have their headquarter in UAE and a satellite office in Qatar. For that reason, the majority of the medications, equipment were shipped to Qatar via their warehouses in UAE. The technical staff to repair and maintain the equipment came from UAE. Most personnel were also sent to UAE for their regular meeting and training. Since Qatar was depended a lot on UAE, a legal dilemma was faced by international company, if direct export to Qatar would infringe their legal agreement with their distributor in UAE. However, Qatar began sourcing supplies out from other countries such as Iran and Turkey.

#### **4.3- Qatari Import and Export Movements before the Blockade**

In 2003, The GCC customs union came in to force and eliminated tariffs between the GCC countries and enforces a unified 5% tariff on all imported goods across the GCC countries [39]. This union has enabled the six countries to increase their import and export movements between them. Due to this agreement Jebel Ali, a marine port and logistics area in the UAE, became a major play for trade in the GCC countries (Figure 8). Many companies deliver their items to Jebel Ali and pay the 5% tariff to distribute their goods to other GCC countries. Indeed, many Qatari supplies were delivered through Jebel Ali [40].



Figure 8: Main seaports in GCC and Iran. Jabel Ali in UAE (red circle) plays significant rules in import and export movement for Qatar

### 4.3 - Imports and Exports after the Blockade

The blockade has led to many changes in import and export movements because many Qatari supplies pass either from Jebel Ali to Qatar marine ports or through Abo Samra, the only land border port in Qatar (called Salwa Port from the KSA side).

Following the blockade, the way in which Qatar imports and exports is through other marine ports in friendly countries (Sohar and Salalah ports in Oman, Shuwaikh Port in

Kuwait, Karachi port in Pakistan, Izmir port in Turkey as well as Mundra and Nhava Sheva ports in India) [41] and by air.

Qatar has three main seaports: Doha Port, Al-Ruwais Port (north) and Hamad Port (south). Hamad Port in the Um Alhoul area south of Doha became fully operational in December 2016 while officially launched was on Sept 2017[41, 42] . It cost 27 billion Qatari riyals and includes a new port, a new base for the Qatari Emiri Naval Forces, and Um Alhoul economic zone [42]. Um Alhoul is between Hamad Port and the Mesaieed Industrial Zone. This zone has an area of 34 square km and is ready to be an advantageous hub for several industries. Um Alhoul can be reached by road, sea, or rail. The intention is that it will be the predominant gateway for Qatari imports and exports [43].

After the blockade, shipping routes were changed to reach Qatar directly through Hamad Port without passing through Jebel Ali. The new routes open new markets for product exchange.

Total annual import of Qatar prior to embargo ranged between 800 to 900 million Qatari Riyal (2.17 Billion US\$). It had its sharpest drop in June 2017 reaching a value of 1.6 billion USD compared to 2.6 billion USD in April (Figure 9 and 10). The import recovered in Aug of 2017 (two months only post blockade) and reached to its highest 35.42 billion in October of 2017, the highest since 2013 (Figure 9 and 10).

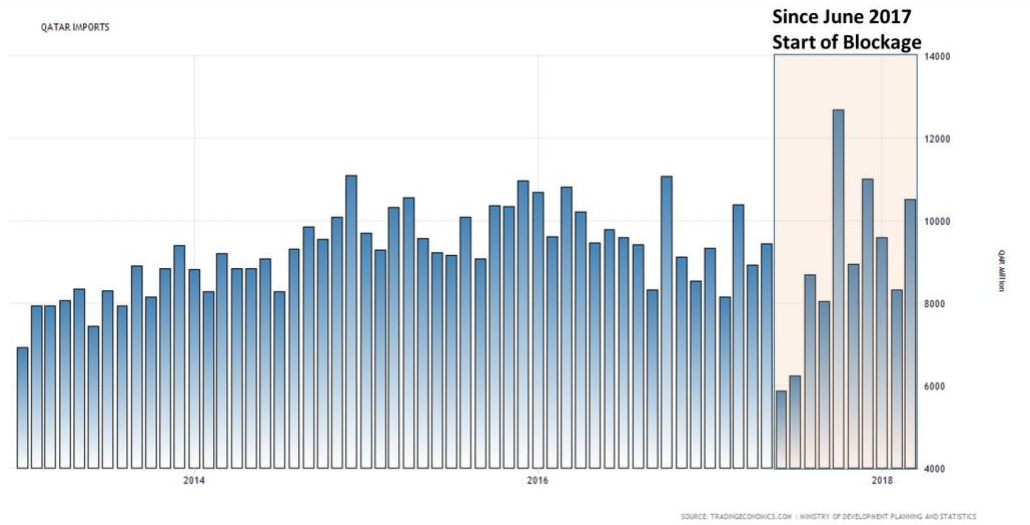


Figure 9: Qatar world Imports from March 2013 to March 2018. The shaded area is the period under Embargo

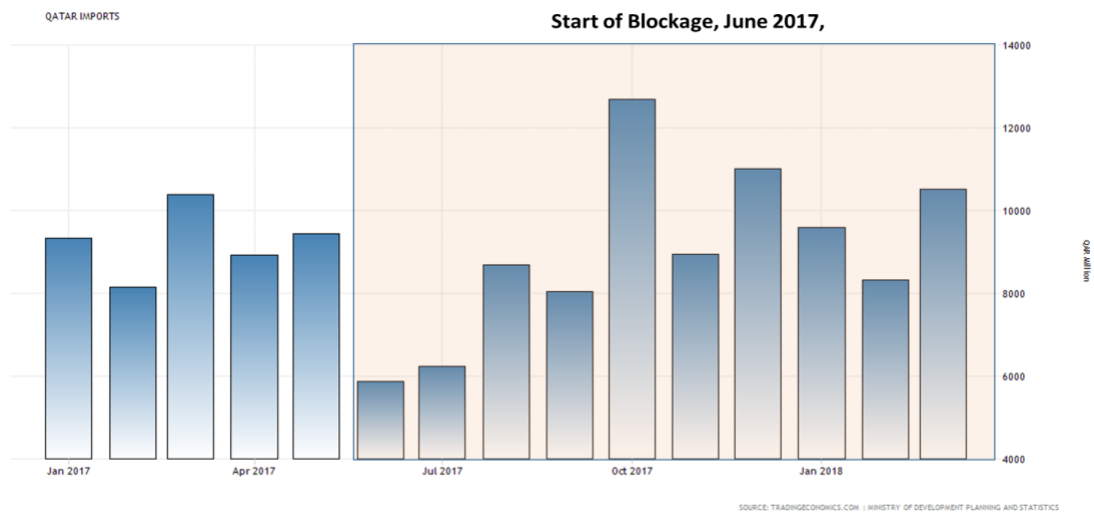


Figure 10: Qatar world Imports from Jan 2017 to March 2018. The shaded area is the period under Embargo

Europe (EU) represents the biggest trading partner with Qatar in terms of import goods. 31% of all goods entering Qatar come from EU. There was a slight decrease in import from EU in 2017 compared to the 2016 and 2015 (-6.4% and -4.6%, respectively) (Figure 11). Interestingly, the import of the pharmaceutical product from EU had a 47.1% increase compared to the previous year (Figure 12). Furthermore, Qatar imported 70.1% more pharmaceutical from different major countries in 2017 compared to the previous year (Figure 13).

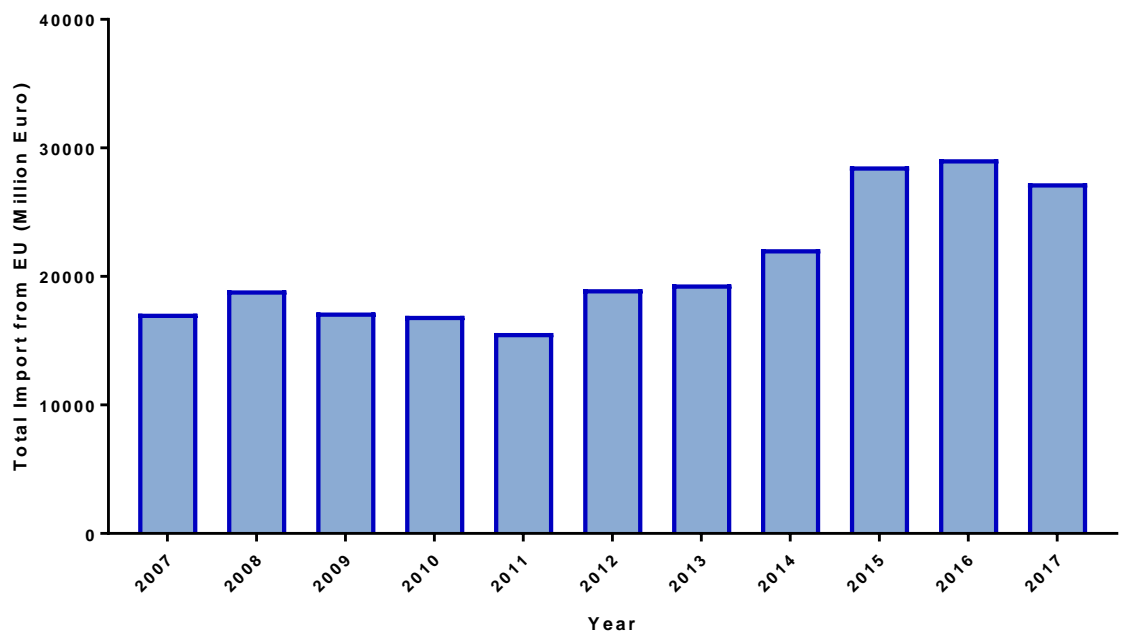


Figure 11: Qatar import from EU 2007 to 2017.

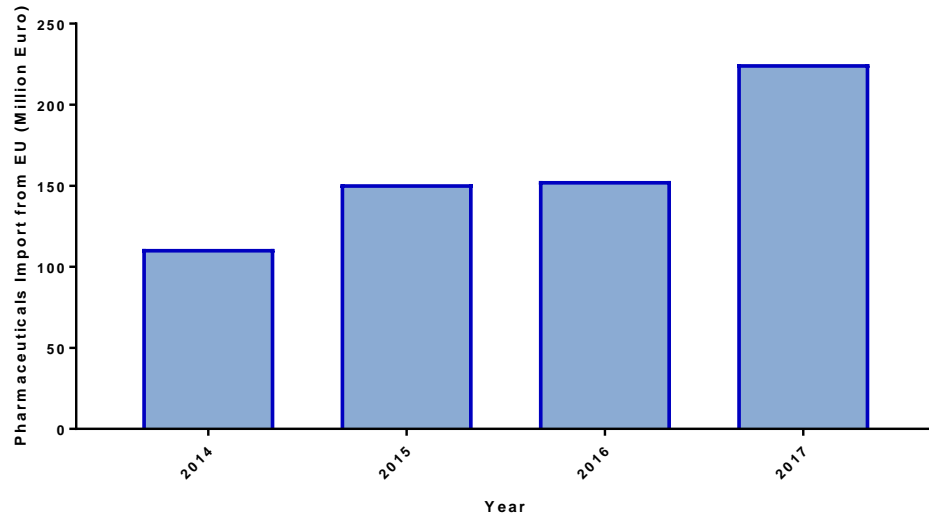


Figure 12: Qatar Pharmaceuticals import from 2014 to 2017. EU export represent 31% of total of exports to Qatar.

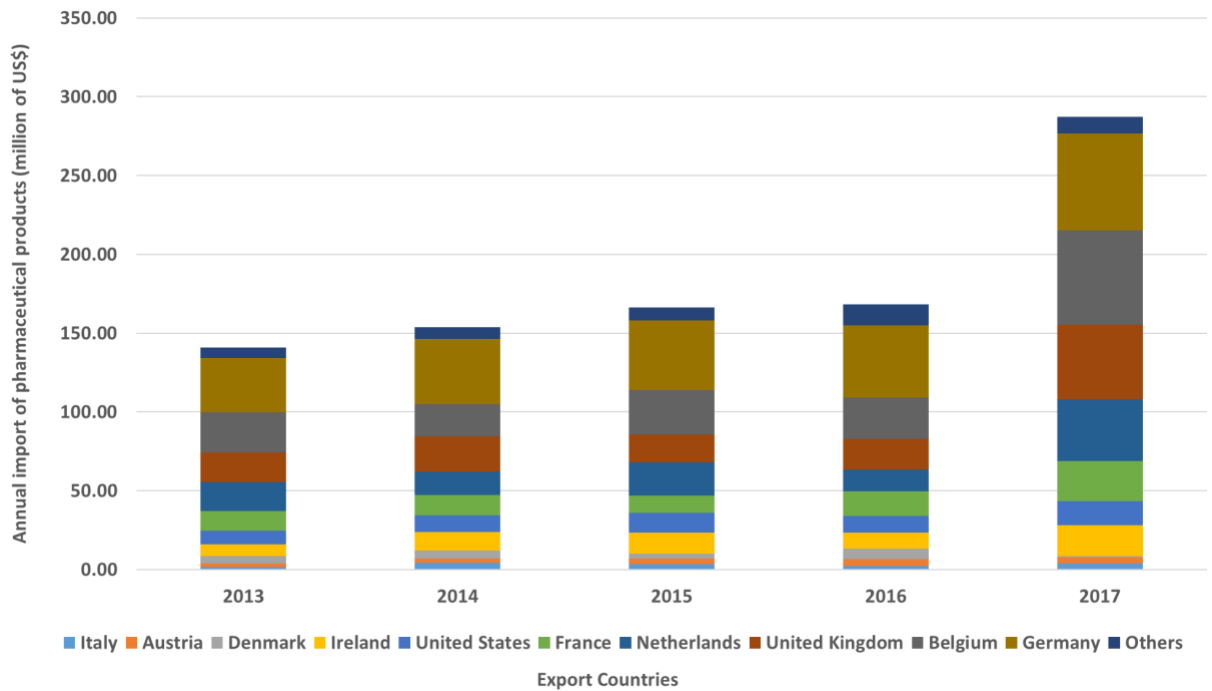


Figure 13: Qatar Pharmaceuticals import from 2013 to 2017[44]

Pharmaceuticals import from EU in 2017 was 225 Euro that represents 2.2% of total import from EU. It grows by 47% compared to 2016 [45].

The pharmaceutical import from the Netherlands, United Kingdom and Belgium (183%, 141% and 131% respectively) (figure 15).

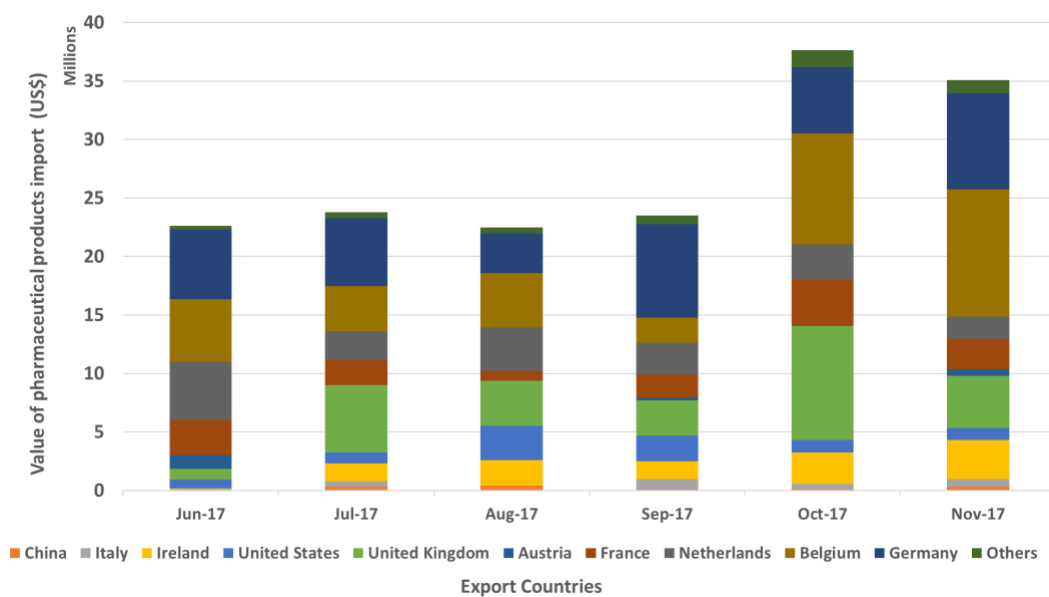


Figure 14: Qatar Pharmaceuticals import from June to Nov 2017[44]

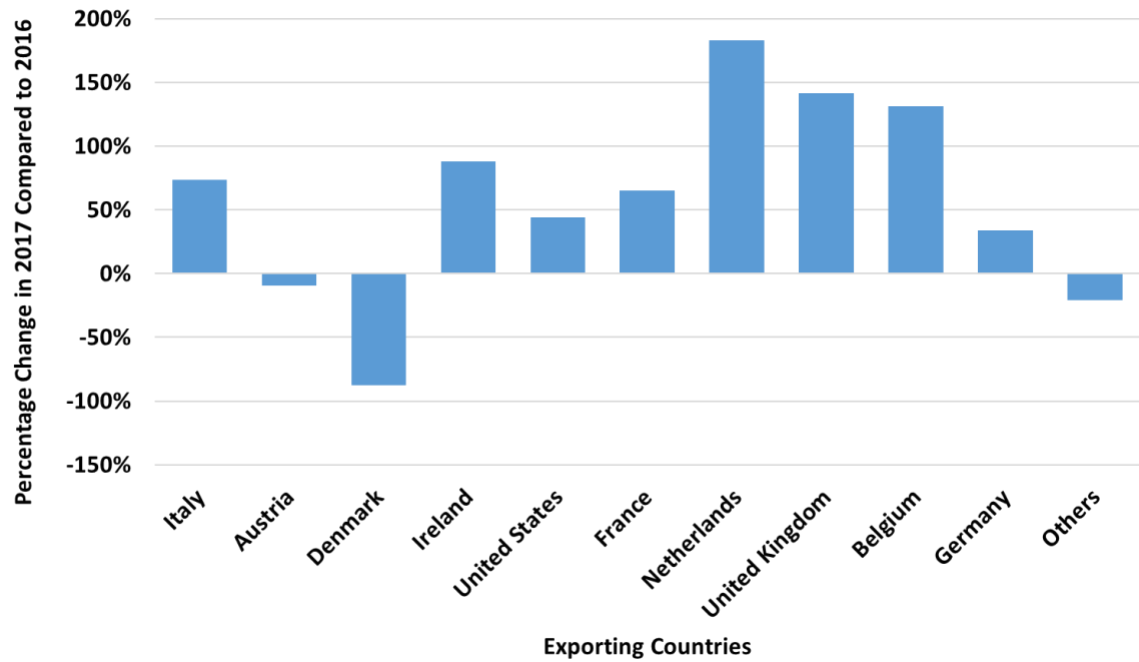


Figure 15: Contribution of trading partners to increase of Qatar Pharmaceuticals import in year 2017 compare to 2016[44].

#### 4.4 - Qatar and the population health

To date, Qatar has not been exposed to military attacks during the blockade. The infrastructure has not been destroyed or damaged. No known terrorist attack was reported. The police presence on the street, except some late night random police check, is not increased. There was no drop of the birth rate or increase in mortality compared to last year. This situation can be seen in the statistical population estimates, live births, and



deaths. Figures 16, 17, and 18 show the statistical counts according to the Ministry of Development Planning and Statistics in 2017 and 2018, which represent six months before and after the blockade began [46]. As can be observed, there is a slight increase in all figures in 2018 compared with 2017.

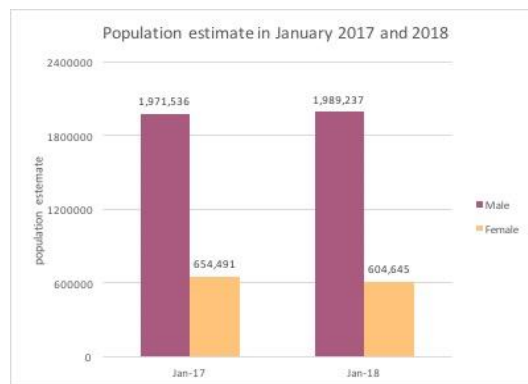


Figure 16: Population estimates from January 2017 to 2018.

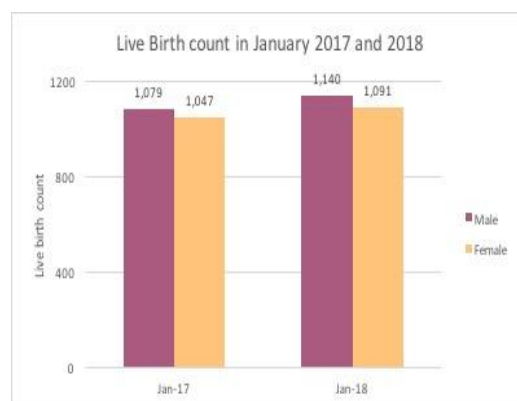


Figure 17: Live birth count from January 2017 to 2018

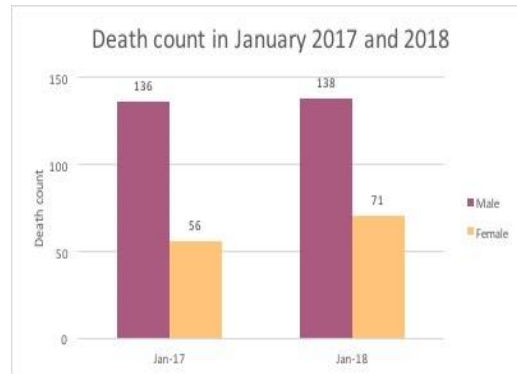
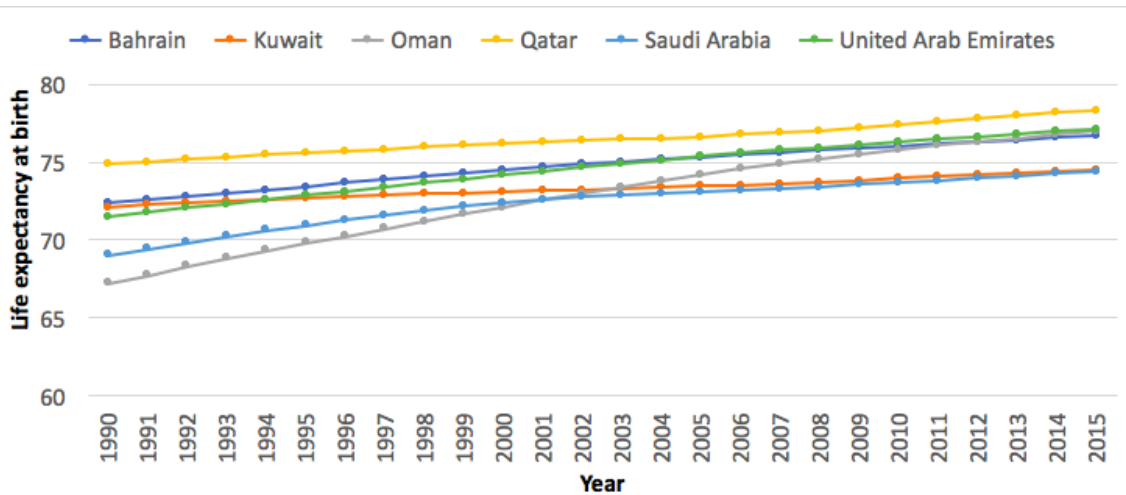


Figure 18: Number of death from January 2017 to 2018.

One of the main indicators to measure the wellness and happiness in country is the general population health. It is a two-way street. People's wellness not only reflects the level of a country's development but is also an important driver of it. Good health increases people's contribution to economical development and improves the productivity [47]. According to the United Nations Development Program, Qatar is globally ranked 33 in the *human development index*. A major component of this rating is health in addition to other factors such as education, income, human security [48]. Healthy living as much as healthy aging of a population increase their ability to save and invest in physical and intellectual capital. Accordingly, it will results in increase in Growth Domestic Product (GDP) and country economy [49]. Life expectancy may be the best indicator to represent the wellness of a

nation. It is used as an assessment factors for ranking by the United Nations Development Program. Figure 19 compares the position of Qatar and other GCC countries in accordance with a life expectancy index from 1990 to 2015. Life expectancy for Qatar was 78.3 years in 2015 [48]. According to IndexMundi, Qatar and Bahrain were ranked second in terms of life expectancy of 79 years in the Middle East in 2017 [50].



**Figure 19:** Life expectancy index for all GCC countries in 2015.

Another indicator of wellness is the mortality rate. Qatar has the lowest female mortality rate compared with other GCC countries. Moreover, it ranked second in terms of male mortality in 2014 (see figure 20-21) [48].

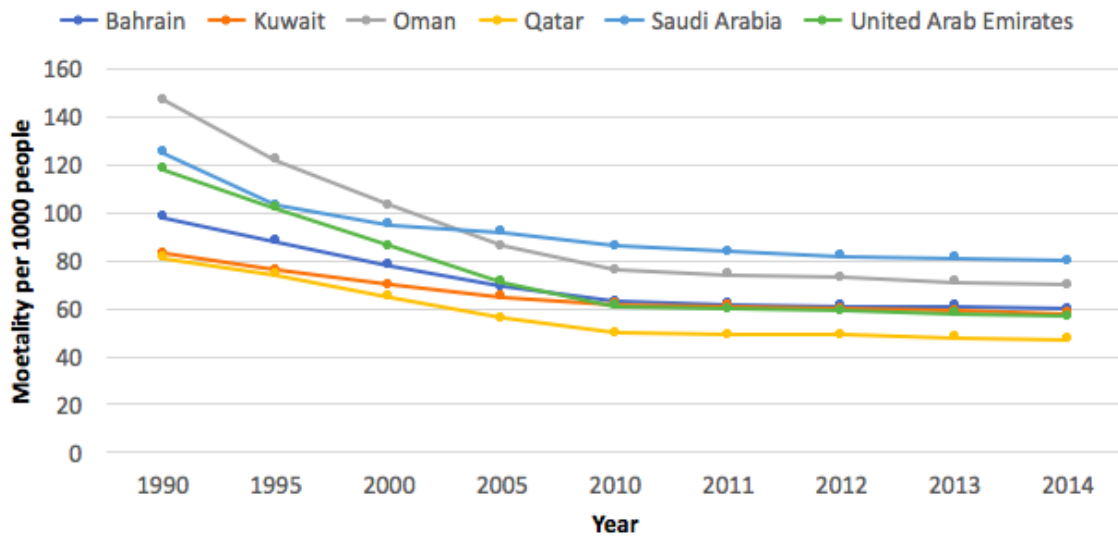


Figure 20: Adult female mortality rate per 1000 people in GCC countries.

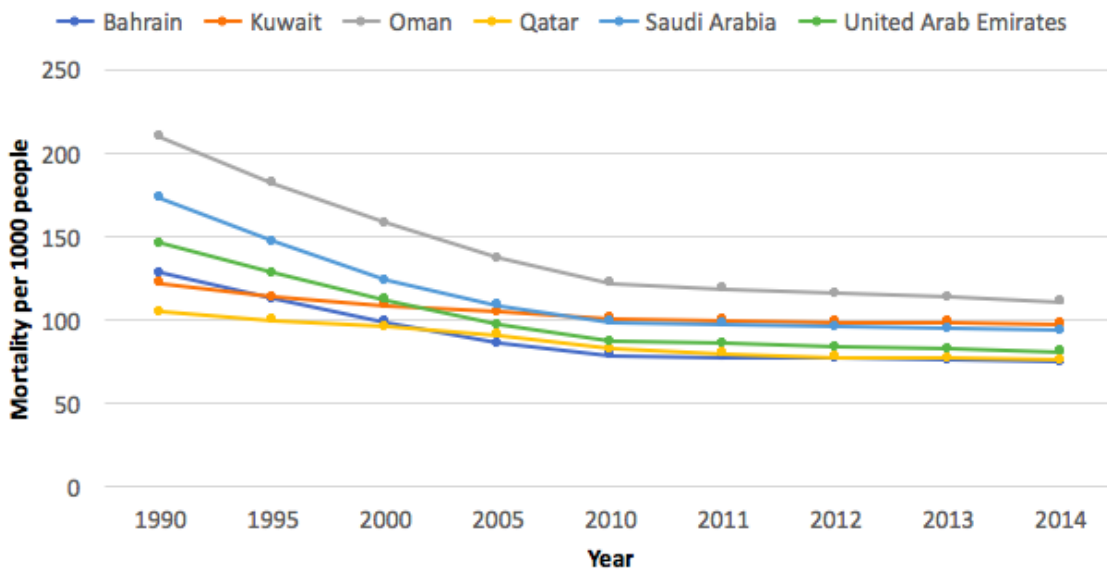


Figure 21: Adult male mortality rate per 1000 people in GCC countries.

## 4.5 Health Expenditure

In 2018, the budget for the health sector is 22.7 billion Qatari riyals, representing 11.2% of total expenditure “4.1 % lower than 2017” and approximately 8,593 riyals per capita [51] Figure 22. On the other hand, QR24.5bn had been allocated to the health sector in 2017 (12.3% of total expenditure ) which allowed major projects to be financed [52]. The Gulf state is expected to spend \$5.2bn (QAR19bn) on healthcare this year, compared to \$4.7bn (QAR17.5bn) in 2014[53].

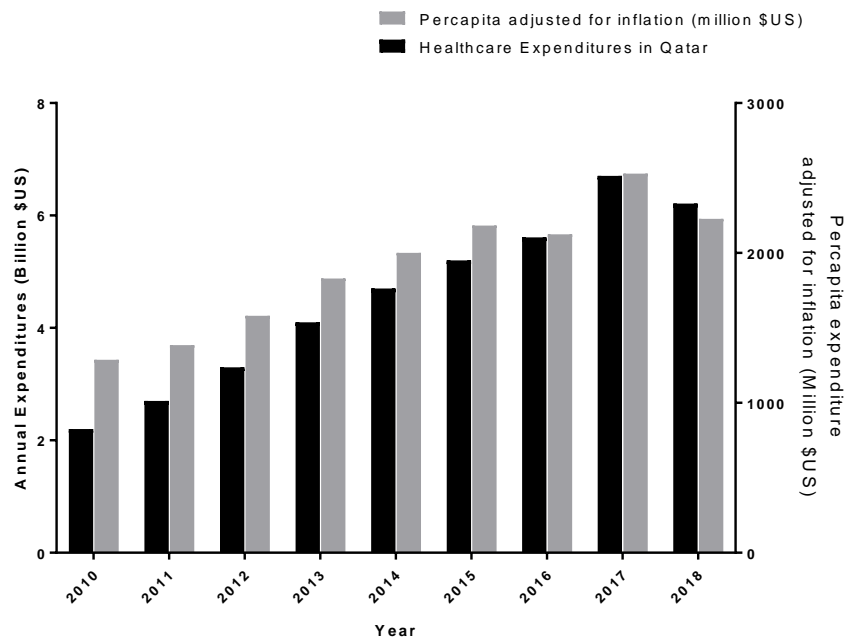


Figure 22. Qatar Annual health expenditure from 2010 to Q1 of 2018. The per capital expenditure are corrected for the inflation rate.

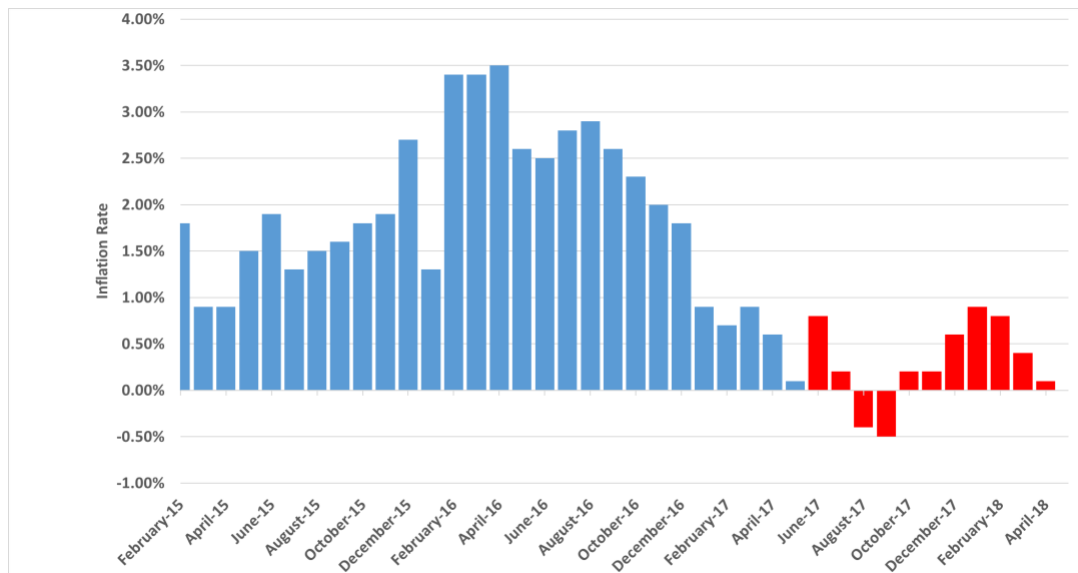


Figure 23. Monthly inflation rate from between February 2015 to April 2018. Red bars represent the inflation rate under embargo.

Given the fact that building new health centers over the next 5 years will cost QR2.9 billion a large portion of the budget dedicated to the health-care sector is spent on services such as laboratories, medication, patient care, instruments, equipment, software, and so on. Because Qatar rarely has local producers of medical supplies, almost all the materials are imported at significantly higher cost. For example, in Qatar the import value of medicinal and pharmaceutical products in the fourth quarter of 2017 was 645 million Qatari riyals[54] [55]. In addition to incurring shipping cost all the import goods, including the medical supplies are subjected to 5% (value of the goods) custom duties[56]. Moreover, the lack of local/regional competitors contributes to the high prices. In the long run, even in a very efficient Overall, such high costs may affect Qatar's health budget. With the rapid

expansion of facilities, the operational costs for governmental health-care providers should not be also burden to the total health sector budget, especially since Qatar is expecting many international events such as the World Cup 2022.

#### **4. 5- Effect on Medical Supply Chain Management and Logistics Services**

The main goal of supply chain management (SCM) is to design the workflow between customers, suppliers, and information in effective and economical ways. The KSA, UAE, Bahrain, and Egypt banned Qatar airways and any Qatari shipment from passing through their geographical areas; thus, SCM was affected and alternative ways to deliver items to Qatar took longer to reach the end users. Jebel Ali was very important to the medical supply chain as the destination of supplies before they were being forwarded to Qatar. However, the rapid intervention of the Qatari government following the start of the blockade meant that supplies could still be delivered quickly even though the cost was high in the first two months, which was the acute phase of the crisis. This might explain the cost of importing pharmaceutical in October 2017 (Figure 12). It seems that the government also managed air and sea freight by cooperating with friendly countries.

Medication, and laboratory reagents and consumables, are controlled by their shelf lives and expiry dates. Long-lasting medical supplies were not affected at all by the blockade because Qatar had strategic inventories of medical supplies that covered the state's needs for approximately six months. However, short shelf-life supplies needed rapid intervention, especially because many shipments that had entered Jebel Ali were banned from being

forwarded to Qatar. This situation also applied to medical supplies from the KSA. The blockade from three sides changed the regular SCM plan; however, delays were expected and the cost was sometimes high (Figure 13).

#### **4. 6- Effect on Contractual Management**

Most medication in Qatar used to enter the country as a result of GCC contracts, which governed the importation of medication to all GCC members. The management of such contracts is one of the tasks of the Gulf Health Council, which is located in Riyadh (Saudi Arabia). Of approximately 1,700 items of drugs were ordered through these contracts each year. However, at the time of blockade, all of the ordered items were received except 104 which represent 6.12 % of the total order. Such drugs were just one example of many pending items and contracts in the KSA, the UAE, Bahrain, and Egypt. Similar scenarios were applicable to laboratory reagents and consumables. One of the step taken by Qatar was to increase its import from the existing EU countries (Figure 14) and also entering into new working relationship with other countries such as Pakistan and Turkey. Although the direct import of the drugs, in some instances lead to lower cost, the overall cost increased due to an increase of insurance premium by some companies that are considering Qatar to be a conflict area.



#### **4. 7- Effect on Private Medical Suppliers**

Majority of private companies dealt exclusively with UAE. Many of companies have their headquarter in UAE and just operating from an office in Qatar. There are four types of costs that suppliers had to face following the blockade in order to cover Qatar's needs.

1- Legal costs. Because of the urgent need to stabilize the situation regarding the short shelf lives of medication and laboratory consumables, Qatari suppliers had to pay legal costs in the newly opened markets.

2- Direct Cost: insurance and freight (CIF) . Local suppliers sometimes had to pay new CIF bills because some insurance companies consider Qatar to be a conflict area, thus increasing the cost of insurance. Air and sea freight costs also increased because of changed routes.

3- Free on board (FOB) . Foreign suppliers guaranteed no costs in their countries; however, local suppliers had to pay the costs from foreign ports to Qatar.

4- Ex-works. In order to place maximum responsibility on local suppliers, some foreign suppliers used this method and forced the local suppliers to receive items direct from the factories.

#### **4. 9- Effect on health infrastructure**

The infrastructure in Qatar are new. Majority of the equipment are recent purchased. Therefore, there is no evidence that suggest the blockade had any negative impact on the infrastructure itself. On the other hand, the biggest expansion in Health facilities in Qatar

was done in September 2017 when H. H sheikh Tamim Bin Hamad Al-Thani , the Emir of Qatar, inaugurated HMC's new medical city complex which includes 3 hospitals[57]. PHCC in addition, announced the opening of four healthcare centers will be in 2018. In addition to that the allocated budget for health, despite a 7% decrease (6.70 Billion USD in 2016 vs 6.12 Billion USD in 2017). In fact it remained the highest in the past 8 years (Figure 22). It can be assumed that there will be no negative affect due to the lack or decrease in funding.

## CHAPTER 5: DISCUSSION AND RECOMMENDATIONS

### **5. 1- Discussion**

This study shows that the blockade temporarily affected Qatar's import in June of 2017, which lasted for another month. However, it seems that the level of import was quickly raised, although at the cost of incurring a higher price. Although, just before the blockade, the inflation rate in May 2017 was near zero, upon blockade it increased to 0.8% in June 2017, and yet it was still 31% of that inflation rate of June 2016 (figure 23). In general, the inflation rate remained below 1% in 2017, and reaching a negative value in July and August. It seems that the governmental health-care providers were able to manage the situation quickly and adapted to the new situation. The blockade's effect on SCM reveals the need to have new suitable markets that are capable of covering Qatar's emergency needs directly. In addition, it may be necessary to have a stock of medical supplies that could cover the country's needs for at least one year.

There is also a need to have hubs of international medical suppliers and to start creating a competitive environment to break monopolies.

### **5. 2- Recommendations**

A number of gaps are now clear regarding the maintenance of sustainable health-care services in laboratories and pharmacies in the context of an unexpected disaster. The following recommendations address a persistent need for the reform of any weaknesses.

- 1- A medical logistics area should be built with large inventories in order to maintain supplies inside Qatar and avoid facing a shortage. The area could be located at the Um Alhoul economic area near Hamad Port.
- 2- In order to guarantee that no more resources are lost, it is essential to build, at least, factories and laboratories that economically produce suitable medical supplies that have short shelf lives.
- 3- It is important to have a medical free-zone area like Qatar Science and Technology Park have in order to facilitate the movement of supplies.
- 4- Export and import protocols should be facilitated.
- 5- At Qatar University, you can find first-class intellects in all specializations (biomedicine, chemistry, information technology, engineering, marketing, finance, operations, et cetera) . A medical supplies, kits or drugs factories should be initiated at the university in order to benefit from these intellects. Such benefits will be apparent in the health sector, society, and the economy.

## REFERENCES

1. European Observatory on Health Care Systems. 2000. p. 8. AMS 5012667 - Google Search. 2018.
2. National Insurance Act 1911 - Wikipedia. 2018.
3. Affairs, Q.M.o.F., The Permanent Mission of the State of Qatar to the United Nation. 2018.
4. Website, H.M.C., Hamad Medical Corporation Website. 2018.
5. (Al-Meezan), Q.L.P., Al Meezan - Qatary Legal Portal :: Law No. 7 of 2013 on the Social Health Insurance System. 2018.
6. ALmeezan.qa. Law No. 7 of 2013 on the Social Health Insurance System. 2013 [cited 2018 May 14]; Available from: <http://www.almeezan.qa/LawView.aspx?opt&LawID=4770&language=en>.
7. GULF\_TIMES. Qatar set for 14% growth in healthcare sector: report. 2014 [cited 2018 May 17]; Available from: <http://www.gulf-times.com/story/389428/Qatar-set-for-14-growth-in-healthcare-sector-repor>.
8. AlJazeera-Net. 2016. قطر تفتتح سبعة مستشفيات خلال ١٨ شهرا. [cited 2018 April 13]; Available from: <http://www.aljazeera.net/news/healthmedicine/2016/5/3/قطر-تفتتح-سبع-مستشفيات-جديدة-خلال-18-شهرا>.
9. Qatar-Tribune. PHCC to open four new health centres next year. 2017 [cited 2018 April 13]; Available from: <http://www.qatar-tribune.com/news-details/id/95481>.
10. Qatar Monthly Statistics, Statistics of December 2017. 2018 March 30, 2018];

Available from: <https://www.mdps.gov.qa/en/statistics/Statistical>

11. History of Qatar: The Discovery of Oil. 2010 [cited 2018 April 27]; Available from: <http://middleeastarab.com/qa/history-qatar-discovery-oil.html>.
12. The\_Daily\_Records. Top 10 Largest Gas Producing Countries In The World. 2018 [cited 2018 April 27]; Available from: <http://www.thedailyrecords.com/2018-2019-2020-2021/world-famous-top-10-list/world/largest-gas-producing-countries-world-natural-reserves/3735/>.
13. BBC-news. Qatar profile - Timeline. 2018 [cited 2018 April 27]; Available from: <http://www.bbc.com/news/world-middle-east-14702609>.
14. Authority, T. 15 things to know about Qatar. [cited 2018 April 27]; Available from: <https://www.visitqatar.qa/corporate/media/research-and-fact-checking/15-things-to-know-about-qatar.html>.
15. The\_Peninsula. Qatar ranks high in safety and security globally despite blockade. 2017 [cited 2018 April 27]; Available from: <https://www.thepeninsulaqatar.com/article/04/11/2017/Qatar-ranks-high-in-safety-and-security-globally-despite-blockade>.
16. topend\_sport. Sport in Qatar [cited 2018 April 27]; Available from: <https://www.topensports.com/world/countries/qatar.htm>.
17. HMC. Qatar's Health System Ranked 13th Best in the World. 2018 [cited 2018 March 18]; Available from: <https://www.hamad.qa/EN/news/2018/March/Pages/Qatars-Health-System-Ranked-13th-Best-in-the-World.aspx>.
18. Goodman, A., The Development of the Qatar Healthcare System: A Review of

- the Literature. *International Journal of Clinical Medicine*, 2015. 6: p. 177-185.
19. HMC. our organization 2018 [cited 2018; Available from:  
<https://www.hamad.qa/EN/About-Us/Our-Organization/Pages/default.aspx>.
  20. PHCC. PHCC. 2018; Available from:  
[https://www.phcc.qa/portal\\_new/index/index.php?limit=home](https://www.phcc.qa/portal_new/index/index.php?limit=home).
  21. SwissRe. Sigma No 1/2016: Natural catastrophes and man-made disasters in 2015: Asia suffers substantial losses. 2016 [cited 2018 April 28]; Available from:  
<https://reliefweb.int/report/world/sigma-no-12016-natural-catastrophes-and-man-made-disasters-2015-asia-suffers>.
  22. SwissRe. NATURAL CATASTROPHES AND MAN-MADE DISASTERS IN 2016: A YEAR OF WIDESPREAD DAMAGES. 2017 [cited 2018 April 28]; Available from:  
[http://institute.swissre.com/research/library/NatCat\\_and\\_manmade\\_disasters\\_2016.html](http://institute.swissre.com/research/library/NatCat_and_manmade_disasters_2016.html).
  23. SwissRe. Sigma No 1/2018: Natural catastrophes and man-made disasters in 2017: a year of record-breaking losses. 2018 [cited 2018 April 28]; Available from: <https://reliefweb.int/report/world/sigma-no-12018-natural-catastrophes-and-man-made-disasters-2017-year-record-breaking>.
  24. WHO. EARTHQUAKES - Technical Hazard Sheet - Natural [cited 2018 April 14]; Available from:  
<http://www.who.int/hac/techguidance/ems/earthquakes/en/>.
  25. AMADEO, K. Japan's 2011 Earthquake, Tsunami and Nuclear Disaster Economic Impact on Japan and the Rest of the World. 2018 [cited 2018 April 28]; Available

from: <https://www.thebalance.com/japan-s-2011-earthquake-tsunami-and-nuclear-disaster-3305662>.

26. Zuskin E1, M.J., Doko Jelinić J, Pucarín-Cvetković J, Milosević M., Effects of volcanic eruptions on environment and health. *Arh Hig Rada Toksikol.* , 2007. 58(4): p. 8.
27. euronews. The economic costs of Syria's civil war. 2017 [cited 2018 April 28 ]; Available from: <http://www.euronews.com/2017/03/17/the-economic-costs-of-syria-s-civil-war>.
28. Cambridge, embargo, in Cambridge Dictionary.
29. Cambridge, blockade, in Cambridge dictionary.
30. PEPPER, M. The Costs of the Embargo. [cited 2018 April 2018]; Available from: <http://www.dollarsandsense.org/archives/2009/0309pepper.html>.
31. Santiago, J. A timeline of the Cuban embargo. 2017 [cited 2018 March, 16]; Available from: <https://www.weforum.org/agenda/2016/02/a-timeline-of-the-cuban-embargo/>.
32. Randal, J., Does the U.S. Embargo Affect Cuban Health Care? *Journal of the National Cancer Institute*, 2000. 92(12): p. 1.
33. Randal, J., Embargoes and Economics: the Birth of Biotechnology in Cuba. *Journal of the National Cancer Institute*, 2000. 92(12): p. 2.
34. Abhishek Sharma, S.R.M.a.a.W.A.K., Trade in medicines and the public's health: a time series analysis of import disruptions during the 2015 India-Nepal border blockade. *Globalization and Health*, 2017: p. 9.
35. BBC. Nepal blockade: Six ways it affects the country. 2015 [cited 2018 March



- 17]; Available from: <http://www.bbc.com/news/world-asia-35041366>.
36. Abu-Rmeileh, N.M.E., Hammoudeh, W., Mataria, A., Husseini, A., Khawaja, M., Shannon, H. S., ... Giacaman, R. , Health-related Quality of life of Gaza Palestinians in the aftermath of the winter 2008–09 Israeli attack on the Strip. *The European Journal of Public Health*, 2012. 22(5): p. 6.
  37. UN-News. UN warns of 'rapidly unfolding' health disaster in Gaza. 2014 [cited 2018 April 14]; Available from: <https://news.un.org/en/story/2014/08/474292-un-warns-rapidly-unfolding-health-disaster-gaza>.
  38. THE QATAR CRISIS. 2017, The Project on Middle East Political Science.
  39. Trenwith, C. The case for free trade in the GCC. 2015 [cited 2018 March 10 ]; Available from: <http://www.arabianbusiness.com/the-case-for-free-trade-in-gcc-604126.html>.
  40. ICIS. New chemical capacity set to put Middle East supply chain under strain. 2010 [cited 2018 May 18]; Available from: <https://www.icis.com/resources/news/2010/12/03/9415860/new-chemical-capacity-set-to-put-middle-east-supply-chain-under-strain/>.
  41. Qatar-Tribune. Blockade-busting port to help Qatar achieve food security. 2017 [cited 2018 May 14]; Available from: <http://www.qatar-tribune.com/news-details/id/84165>.
  42. HPP. Hamad Port Project. [cited 2018 April ]; Available from: <http://www.npp.com.qa/>.
  43. manateq. Um ALHOUL. [cited 2018 April]; Available from: <https://www.manateq.qa/en->

gb/invest/specialeconomiczones/Pages/UMALHOUL.aspx.

44. Website, N.t., Foreign Trade of Qatar of NCE pharmaceutical products. 2018.
45. Websites, E.C.-T., European Union, Trade in goods with Qatar 2017. 2017.
46. MODPAS, QATAR MONTHLY STATISTICS, Statistics of January 2018. 2018, Ministry of Development planing and statistics.
47. WHO. Health and development. [cited 2017 10-April]; Available from:  
<http://www.who.int/hdp/en/>.
48. Human\_Development\_Reports. Qatar. 2016 [cited 2018 May 5]; Available from:  
<http://hdr.undp.org/en/countries/profiles/QAT>.
49. Swift, R., The relationship between health and GDP in OECD countries in the very long run. Health Economics, 2011.
50. index-mundi. Life expectancy at birth - Middle East. 2018 [cited 2018 April 27]; Available from: <https://www.indexmundi.com/map/?t=0&v=30&r=me&l=en>.
51. Tribune, Q., A big-spending budget for 2018, in Qatar Tribune. 2017: Qatar.
52. newspaper, T.P., Qatar's general budget: Key sectors get higher outlay; Health and education get 22.7%. 2018.
53. website, G.I.H., Qatar Budget 2016. 2016.
54. newspaper, P., Qatar 2018 budget sees rise in spending, smaller deficit. 2017.
55. MODPAS, Quarterly Bulletin On Foreign Merchandise Trade Statistics\_ Quarter 4. 2018, Ministry\_of\_Development\_Planing\_and\_Statistics: State of Qatar.
56. HUKOOMI. CUSTOM AND PORTS LAW. [cited 2018 May 17]; Available from:  
<http://portal.www.gov.qa/wps/portal/topics/Business+and+Finance/customsandpo>

rtslaw.

57. HMC. HH The Emir Officially Opens HMC's New Medical City Hospitals. 2017 [cited 2017 May 19 ]; Available from:  
<https://www.hamad.qa/EN/news/2017/December/Pages/HH-The-Emir-Officially-Opens-HMCs-New-Medical-City-Hospitals.aspx>.