

**An- Najah National University**  
**Faculty of Graduate Studies**

**The Effect of Public Health Expenditure in Reducing  
the Risk in the Public Health Care System in Palestine**

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**This Thesis is Submitted in Partial Fulfillment of the Requirements for  
the Degree of Master of Risk Management, Faculty of Graduate  
Studies, An-Najah National University, Nablus, Palestine.**

**2019**

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## Dedication

لا بد لنا ونحن نخطو خطواتنا الأخيرة في الحياة الجامعية من وقفة نعود فيها إلى أعوام طفولتنا الجميلة التي سهرت فيها أمي على راحتنا لنصل إلى ما وصلنا إليه، فقبل أن أشكر وأهدي هذه الرسالة أود أن انحني شكراً وامتناناً إلى والدي العزيزة التي لولاها لما وجدت في هذه الحياة ولا في هذا المكان ومنها تعلمت الصمود مهما كانت الصعوبات، كما أود أن أترحم على والدي الطيب وأهديه هذه الرسالة وأتمنى من الله أن يجزيه أجر هذا العمل، كما أود أن أخص بالذكر عمي عادل عودة الي كان معي دائماً بكل الأوقات وهو قدوتي ووالدي الثاني، ولا أنسى أخواني وأخواتي الأعزاء الذين وقفوا معي وكانوا قوتي عندما أضعف .

وقبل أن نمضي نقدم أسمى آيات الشكر والامتنان والتقدير والمحبة إلى دكاترتنا الكرام الذين قدموا لنا الكثير باذلين بذلك جهوداً كبيرة في بناء جيل الغد لتبعث الأمة من جديد.... إلى الذين حملوا أقدس رسالة في الحياة.... إلى الذين مهدوا لنا طريق العلم والمعرفة.... إلى جميع دكاترتنا الأفاضل...

" كن عالماً .. فإن لم تستطع فكن متعلماً، فإن لما تستطع فأحب العلماء، فإن لما تستطع فلا تبغضهم "

وأود أن اخص بالشكر والتقدير الدكتور جهاد ياسين والدكتور محمد مرعي الذين نقول لهم بشراك قول الرسول صلى الله عليه وسلم: " إن الحوت في البحر، والطير في السماء، ليصلون على معلم الناس الخير "

وكذلك أشكر كل من ساعد على إتمام هذه الرسالة وقدم لي العون ومد لي يد المساعدة والدعم المعنوي وزودني بالمعلومات والنصائح لإتمام هذه الرسالة الذين كانوا عوناً لي في رسالتي هذه ونوراً يضيئ الظلمة التي كانت تقف أحياناً فيريقي .

## **Acknowledgment**

First, I would like to extend my sincere and sincere thanks to God who always gives me strength. For those persons whom assisted me in this project and have delegated their time in every step of this work, which without it this work would have never been accomplished. For my thesis supervisor Dr.JehadYasin and other supervisor doctors who have spared no effort in guiding me on the right path. For my colleagues and friends, who have helped me and gave me some of their precious time, and to my family, especially my affectionate mother who supporting me day and night, for all those people, I say to thank you and appreciate your support.

## الاقرار

أنا الموقعة أدناه مقدمة الرسالة التي تحمل العنوان:

### **The Effect of Public Health Expenditure in Reducing the Risk in the Public Health Care System in Palestine**

أقر بأن ما اشتملت عليه هذه الرسالة إنما هي نتاج جهدي الخاص، باستثناء ما تمت الإشارة إليه حيث ما ورد، وإن هذه الرسالة ككل، أو أي جزء منها لم يقدم من قبل لنيل أية درجة عملية أو لقب علميا وبحثي لدى أية مؤسسة تعليمية أو بحثية أخرى.

### **Declaration**

The work provided in this thesis, unless otherwise referenced, is the researcher's own work, and has not been submitted elsewhere for any other degree or qualification.

**Student's name:**

اسم الطالبة:

**Signature:**

التوقيع:

**Date:**

التاريخ:

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## Table of Abbreviations

Abbreviation	Explanation
THLEX	Total Expenditure on Health Care by the Government
OPT	Occupied Palestine Territory
UNRWA	United Nations relief and work agency for Palestine refugees
NGOs	Non-Governmental Organizations
NIS	New Israeli Shekel
PHC	Primary Health Care
NCDs	Non-Communicable Diseases
PLO	Palestine Liberation Organization
PHCCs	Primary Health Care Centers
DPT3	Diphtheria, Tetanus, and Pertussi
MOH	Ministry of Health
PCBS	Palestinian Central Bureau of Statistics
OECD	Organization for Economic Co-operation and Development
WHO	World Health Organization
US\$	United States Dollar
GDP	Gross Domestic Product
USA	United States of America
HCE	Health Care Expenditure
VAR	Vector Autoregressive
LEXP	Life Expectancy at Birth
PCI	Per Capita Income
POP	Population
TFR	Total Fertility Rate
CBR	Crude Birth Rate
PCBS	Palestinian Central Bureau for Statistics
SPSS	Statistical Package for the Social Sciences

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**Abstract**

National health is very important for the welfare of any country. Any negligence to this sector will increase national risk and cause the health problems to multiply. Public health expenditure is extremely important for the survival of any society. This study aim to understand the size of the total government expenditure on health sector in Palestine, which is a key element of the national health security and also aim at identifying the linkages between the economics and social factors that may influence the size health expenditure. It has been demonstrated that factors such as per capita income which is a measures of economic development; and other health outcomes variables such as life expectancy at birth, total fertility rate, and crude birth rate might influence health expenditure.

The findings of this study will help policy makers build national health policies aim at protecting and preserving the health sector from any unexpected risk such as deterioration of health services and spread of diseases.

This study utilized regression analysis as a statistical tool to study the effect of key factors from health and economic on total health expenditure by the government in Palestine.

To achieve the goal of the study, we identify one dependent variable which is called total expenditure on health care by the government (THLEX) and several independent variables from health and economic that measures the health outcomes and its risk. Among those independent variables are per capita income, life expectancy, total fertility rate, crude birth rate, and population.

Based on the research results, the study found a positive and significant relationship between the dependent variable which is total expenditure on health care by government and some key independent health variables such as population, per capita income and life expectancy at birth.

The study findings reveal the need to have a clear health risk management strategy aiming at identifying key factors that influence the total health expenditure in Palestine. This should increase awareness and focus the attention on the health sector as a key element of national security and progress.

# **Chapter One**

## **Introduction**

# **Chapter One**

## **Introduction**

### **1.1 General Introduction**

This thesis is concerned with the study of the effect of Public Health Expenditure in Reducing the Risk in the Public Health Care System in Palestine. This chapter has discussed the importance of national health, and some variables which determine the level of health expenditure in any country , through research among previous studies shows there is a few of studies which investigate this effects in Palestine.

The outcome of this thesis will help policy makers build national health policies aim at protecting and preserving the health sector from any unexpected risk such as deterioration of health services and spread of diseases.

This chapter provides a general introduction to the context of the study. Then, the chapter presents the research problem, significance of the study, research objectives, research hypotheses, organization of the thesis and clarification of search strategy.

National health is extremely important for the welfare of any country. A deterioration of the health status is considered a national disaster, which will affect everything negatively in the society. Any deterioration will affect the population structure, population composition,

the labor force and the productivity of the countries resources and factors of production (World Health Organization, 2002).

Hence, the health status and the well-being of the people are the most important elements for longevity and for having a healthy society (The Swedish National Institute of Public Health, 2006). That is why countries spend a lot of money and devote many resources in order to have an efficient health sector and hence a healthy population. Furthermore, any advancement in the national health status is considered a positive step towards building a healthy, productive, and strong society (World Health Organization, 1998).

There is a vast literature on the factors which determine the level of health expenditure in any country. For example in a study related to the Canadian Provincial Government Health Expenditure (Matteo and Matteo, 1998) it has been found that the per capita income and the proportion of population over age 65 are among the main determinants of health expenditure.

In another study on the link between health expenditure and economic growth by (Bloom et al, 2003), stated that the health factor is an essential element of human capital because with good health, labor which is an element of the production process and labor productivity will be enhanced and improved. The study result shows that good health has a positive, sizable, and statistically significant effect of production.

It is well known that public health care is considered a public good. Thus, it is different from any other private goods. Normally, public health care is provided by government or by a private individual or organization without profit to all members of a society because it is considered a basic right for all citizens' individuals (School of Public Health, 2016).

Spending on health care can control diseases, improve health and reduce any future risk. To support this argument a report presented by (World Health Organization, 2001) found that there is a positive correlation between health and economic growth.

Unfortunately, poor and low-income countries spend less money on health care and most of their spending is dependent on donor countries (Audibert et al, 2004). In a separate study by (Novignon et al, 2012), the researchers examined the link between health expenditure and population health. The study shown that health care expenditure determines health status through improving life expectancy at birth and by reducing death and infant mortality rates.

Thus, many countries try to have a quality and an efficient health sector and the only way to have this is to invest heavily in the health sector just as they spend on other sectors like education, defense, transportation and infrastructure. For these reasons, many advanced countries place health as a top priority and assign a big portion of its total budget spending to health sector (World Health Organization, 2003).



It is through health and education societies can increase the ability of their population to survive (World Bank, 1984): Thus by allocating scarce resources more efficiently and by using more technology, societies can create more new ideas to advance both the health and education sectors. This will allow for more job creation and will create more opportunities to support the need of total population (Zimmerman et al, 2015).

This thesis seeks to examine the status of the health system in Palestine through focusing on the relationship between the government health expenditure and the health indicators as well as per capita income which is a measure of economic development. It is understood that the more the country is developed economically, the more the country will spend on its health sector, and the more the country will have a healthy population and a strong health care system.

## **1.2 Research Problem**

Public health expenditure is extremely important for the survival of any society (World Health Organization, 2010). Countries devoted time and resources to promote their health sector because it is important for development and for its progress. The health sector in Palestine did not receive in the past sufficient attention when it comes to research. Thus, there is lack of research in this sector. In addition, this sector faces many problems that hinder its advancement and progress due to limited resources (World Health Organization, 2006). This research will examine the factors

that may impact the delivery capacity of this sector in terms of government spending on health care in Palestine.

It is expected that this research will fill a gap in the literature and contribute to our understanding of how we can preserve and strengthen the health sector capacity in Palestine. The expected findings will help policy makers build national health and population policies aims at protecting and preserving the health sector from any unexpected disasters such as deterioration of services, spread of diseases, and poor customer's services.

### **1.3 Significance of the Study**

The findings of this research will contribute significantly to the overall understanding of the size of the total government expenditure on health sector in Palestine, which is a key element of the national health security and also will identify the linkages to the economics and social factors that influence health expenditure. Among these are population size, per capita income which is a measure of economic development; and other health factors that influence it such as life expectancy at birth, total fertility rate, and crude birth rate.

The selection of the independent variables was done in a way to draw key variables from the field of health, demography and economics that might have a strong relevance and importance in terms of the relationship between theses predictors and the dependent variable which is total health expenditure in Palestine. In addition, the vast majority of the

health literature on this subject had emphasized the importance of the health, demography, and economic variables and their effects on health expenditure. As a result, this study expands on this previous work which has been done before in explaining the linkages between these independent predictors and the total variation in total health expenditure in Palestine.

Good health reduces the risk of chronic diseases (like heart disease and cancer), and promotes healthy lifestyle in the society (World Health Organization, 2004). Thus studying the health sector and the risk it is facing in any society will assist policy makers in designing suitable and adequate health care policies.

Hence any negligence to this sector will cause harm to the society overall (World Health Organization, 2002). In addition, the findings of this research will add knowledge and will determine the factors that may influence the health delivery system in Palestine. Future research in to this subject is extremely important and it is hoped that this research will pave the way to explore the health sector delivery into more depth.

#### **1.4 Research Objectives**

Keeping in mind the importance of the health sector, this thesis aims at achieving the following objectives:

(1) Examining the link between the total public health expenditure and the health outcomes indicators as well as the economic development indicators in Palestine.

(2) Estimating the empirical relationship between the dependent variable which is the total public health expenditure in Palestine and two sets of independent variables. The first set includes several health outcomes or indicators and the second set include per capita income variable which is considered a measure and proxy for economic development in the country.

(3) Presenting a description review of health sector in the Palestine since 2000. Since there is no complete and accurate data within the Palestinian Central Bureau of Statistics before the year 2000 in the data we use it in this study, also the majority of data before this period is missed; thus this year was considered as a starting point in this study.

### **1.5 Research Hypotheses**

This study will be based on the following hypotheses:

**Hypothesis 1:** There is a positive relationship between total health expenditure by the government and per capita income.

**Hypothesis 2:** There is a positive relationship between total health expenditure by the government and population size.

**Hypothesis 3:** There is a relationship between total health expenditure by the government and life expectancy at birth. This relationship can be either positive or negative. The positive relationship indicates that as life expectancy increases, there is a need for more health care spending by the government. At the same time, one may argue that as life expectancy

increases, this means individual are enjoying good health. Hence, their needs for government expenditure may decline.

**Hypothesis 4:** There is a positive relationship between total health expenditure by the government and total birth rate. This means as more children born, and then the demand for more health spending will increase.

**Hypothesis 5:** There is a positive relationship between total health expenditure by the government and total fertility rate.

## **1.6 Organization of the Thesis**

This thesis is organized as follow:

Chapter I provides an introduction to the context of the study, chapter II includes the health sector description in Palestine. The related theoretical framework and literature review is included in chapter III. The research plan and methodology which will be adopted is included in chapter IV. Chapter V presents the main empirical result and findings. Finally chapter VI includes the conclusions and some recommendations.

## **1.7 Search strategy**

The search procedure was based on four main steps: the first step, first of all, related key concepts and terms have been identified, secondly; selected relevant databases and resources also have been identified. The third step included search in the selected resources. Finally, refined search results

have been reviewed. The search strategy was done in English and Arabic languages through books, articles and published reports.

### **1.7.1 Databases**

The database which has been used for this review is the Cumulative Index of Nursing and Allied Health Literature (CINAHL®). CINAHL® was chosen as it provided access to “virtually all English-language nursing and allied health journals” (Polit and Beck, 2011). Also, PubMed, EMBASE :Excerpta Medica Database, Cochrane Library, PopLine, LILACS, and Trip Pro have been used in the databases search.

### **1.7.2 Search Terms**

The search strategy was limited to English and Arabic languages. The search terms were drawn both from the research objectives and hypothesis as well as the conceptual framework. The keywords used, in various combinations, to search the CINAHL® and other databases included: 1) public health, 2) public health expenditure, 3) public health care system, 4) risk management, 5) health outcome indicators and 7) Palestinian public health care system. Titles, abstracts, and texts were all reviewed in order to assess the fit of the article with the stated inclusion criteria.

Articles which have been included within this search are which have been written in English and Arabic language, articles related to public health expenditure, studies related to public health care system in Palestine,

research involving the effect of public health expenditure in reducing the risk in public health care system in general and in Palestine. For this purpose, 80 articles were reviewed based on the above mentioned criteria. On the other hand, duplicate articles found in successive searches were excluded.

## **Chapter Two**

# **Health System in Palestine**



## **Chapter Two**

### **Health System in Palestine**

#### **2.1 Introduction**

The following section included a descriptive section of the status of the health care system in Palestine. It will clarify status of the health sector in Palestine, healthcare system suppliers, healthcare team numbers, hospital systems, and health insurance in Palestine. It also discusses constraints and challenges facing the health system in Palestine.

Occupied Palestine is divided into two major areas; the West Bank, and Gaza Strip. The health care system in Palestine is complex and unique and strongly influenced under the so-called Israeli occupation. The consequences of the closures and separation in the Gaza Strip imposed a great challenge for the ministry of health by creating obstacles regarding the accessibility to health care services and affected the unity of the health care system in all Palestinian governorates (Ministry of Health, 2016).

Covering an area of about 5558 km<sup>2</sup>, the occupied Palestine territory comprises a very densely populated country, with more than 650 inhabitants per square kilometer. Palestinian People are living in two compartments (West Bank including East Jerusalem, and Gaza Strip) that form the Palestinian National Authority territories, with an estimated mid-year population of 4.8 million in 2016, live in West Bank 2.97 million, and Gaza 1.91 million. Up to sixty percent of the population lives in approximately in 452 villages and nineteen refugee camps, and the

reminder in urban refugee camps and cities (Palestinian Central Bureau of Statistics, 2018)

The data showed that the total population in the Palestinian territory in 2017, is **4,781,248** inhabitant (2,881,957 inhabitant are in the West Bank; and 1,899,291 inhabitant in Gaza Strip; (Palestinian Central Bureau of Statistics, 2018). The total population of the OPT in 2013 was about 4 485 459 (50.8% male and 49.2% female), with 41% of inhabitants under 15 years of age (Hamidi et al, 2015).

The Palestinian population showed a high proportion of individuals under the age of 18 years 48.2%, while the proportion of elderly individuals is low. These percentages indicate high fertility rates and the fact that Palestinian society is a young society with a broad, young pyramid base(Palestinian Central Bureau of Statistics, 2012).

The decline in the rates of mortality and the stability of high fertility rates lead to a high natural increase rate of population, which requires appropriate economic and social policies to confront the implications of this increase. It has been estimated by the PCBS that the rate of natural increase in the population of the Palestinian Territory was 2.9% in mid 2011. This is one of the highest rates in the world, since the average annual rate does not exceed 1.2%. The growth in the West Bank was estimated mid-2011 at 2.6% versus 3.3% in the Gaza Strip (Palestinian Central Bureau of Statistics, 2012).

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## **2.2 Health care system in Palestine and challenges**

According to the World Health Organization, a health system is defined as the combined entity of all resources, actors and institutions related to the financing, regulation and provision of all activities whose primary intent is to improve or maintain health. The health systems in any country include all the activities whose primary purpose is to promote, restore or maintain health. Any health system has three major goals. These are enhancing the population health; responding on time to the people's expectations; and decrease the cost of ill- health (World Health Organization, 2000).

On the eve of the 1967 occupation of the West Bank and Gaza by Israel, there were three systems for health service provision operating in the area. The governments of Jordan and Egypt supervised the public system in the West Bank and the Gaza Strip, respectively, while UNRWA provided

health services for refugees (Giacaman et al, 2003). The private sector included charitable organizations operating major hospitals and diagnostic centers or primary care centers (Giacaman et al, 2003). Following the occupation, the Israeli Civil Administration (under the Ministry of Defense and not the Ministry of Health) took over the governmental health care system and proceeded to administer it in a manner that kept it stunted and underdeveloped, with severe budget restrictions, referral to Israeli hospitals for tertiary care, and restrictions on licenses for new medical and health care projects, thus creating a total dependence on the Israeli health system (Giacaman et al, 2003).

Palestinian Authority political system is a new system for the Palestine after Oslo Accord in 1993, It is built to be a Parliamentary system where there is an elected legislative council formed of eighty members elected from North and south provinces (West Bank and Gaza Strip), the Palestinian political system is still under expected changes according to the changes and development of the peace process in the Middle East (World Health Organization, 2006).

There are four main health care providers in the West Bank and Gaza Strip: the ministry of health, United Nations relief and work agency for Palestine refugees in the near east (UNRWA), non-governmental organizations (NGOs) and the private sector (Ministry of Health, 2016).

Generally speaking, the political and economic situation in the West Bank seems more stable than in Gaza strip. In general, health status and health care system in the Gaza Strip has a lot of challenges; this is due to several factors including the political division and the reduction in health expenditure for the Gaza Strip. High unemployment rates also continued to represent one of the main challenges to the Palestinian economy, especially in Gaza Strip which in turn led to deterioration in the health status of the total population over there (Palestine Monetary Authority, 2017).

As a result of this, economy in Gaza, after more than three years of war, is still unable to return to its previous levels, let alone achieve the necessary growth to bridge the production gap and keep pace with population growth and the growing number of people entering the labor market. In general, both regions (West Bank and Gaza Strip) underwent many internal and external shocks since 2000 (ongoing occupation, further settlements, no political solution in sight, less support by donor countries, irregular reconstruction of Gaza Strip funded by donor countries, political turmoil and instability in the Arab region- Arab Spring countries, as well as internal schism) which were behind the obvious irregularity and fluctuation of many key macroeconomic indicators (Palestine Monetary Authority, 2017).

Still with the little progress made to improve the health sector, still Palestinians living in the West Bank and Gaza find themselves in difficult and dangerous circumstances (Mahmoud, 2013). Along with the continued

expansion of settlements and the iron grip on Gaza, more than four million people are living under continuous distress with limited hope for a different future (Mahmoud, 2013). Palestinians in the occupied territory continue to experience or remain at risk of conflict, violence, displacement, denial of access to livelihoods, administrative detention, psycho-social distress or exposure to explosive remnants of war (World Health Organization, 2016).

The Palestinian health situation faces many challenges under the oppressive Israeli occupation of Palestinian land, which deprives the Palestinian citizens of their rights and violates all international treaties, conventions and charters that guarantee the rights of all segments of the Palestinian people. The presence of the Israeli occupation forces, however, is the greatest challenge facing the health sector, as well as the daily acts of violence perpetrated by the occupying army and the hordes of Jewish settlers against Palestinians, in addition to the continued presence of hundreds of military barriers, the apartheid wall and the isolation of the Palestinian territories from each other and from the rest of the world through the closing of the crossings and borders (World Health Organization, 2013).

The wall and other security measures limit population movement, trade, and access to healthcare facilities resulting in a tremendous economic, psychological and social toll. In May 2011, the United Nations' World Health Assembly passed a resolution on health conditions in the occupied Palestinian territory including East Jerusalem, which recognized

the impact of the lack of availability and access to curative and preventive health services (Mahmoud, 2013).

### **2.3 Health insurance and public health expenditure**

Lack of health insurance is a barrier to healthcare for many patients attends clinics for serious ailments only to ascertain if the required investigations are either inaccessible or impractical from a financial perspective (Keelan, 2015). The health insurance in Palestine includes the Compulsory Insurance; the voluntary insurance; insurance of workers within the Green Line (Workers in Israel); group insurance (Group Contracts); insurance of social affairs (Social Welfare) and prisoners' insurance (Ministry of Health, 2017). Regarding the health insurance in Palestine, it can be a governmental, UNRWA, or private insurance. Just over 80% of the population is covered by at least one type of health insurance scheme (World Health Organization, 2016). Governmental insurance covers care only from government providers, unless patients are specifically referred to private or NGO providers, or to providers abroad, for care that cannot be provided in the government sector (Schoenbaum et al, 2005). The unemployed are covered through the Ministry of Labor, the poor through the Ministry of Social Affairs, and through a presidential decree, the Gaza population is covered free of charge (World Health Organization, 2016). UNRWA insurance service people who registered as refugees, also it subsidizes the government system, to the extent that it

provides services that patients would otherwise be entitled to receive from the government system (Schoenbaum et al, 2005).

Regarding the health system finances and total health expenditure, a study by the World Health Organization (WHO) about the health conditions in the occupied Palestinian territory has shown that the total operating budget for 2015, excluding the health workers salaries, was \$322,729,781. This budget was allocated for several items such as medical referrals, medical equipment, medicines and medical. It is worth noting that medicines and medical and laboratory supplies consumed most of the ministry's budget (Ministry of health, 2016).

Therefore, most public health expenditure is funded by general taxes and revenues, as governmental health insurance premiums represent less than 10% of the Ministry of Health budget, which are heavily dependent on the prevailing political climate (World Health Organization, 2016). This has forced the Ministry of Health to incur large debts, which substantially impacts on annual operational expenditure (World Health Organization, 2016).

The size of health expenditure takes a big percentage of it budget, for example, in 2016, the total budget of Palestinian ministry of health was 1,711,900,000 NIS. This number covers all of health ministry expenses, like salaries, treatment medicine and other operating cost (Palestinian Central Bureau of Statistics, 2018).



## **2.4 Current providers of health services in Palestine**

In this research, the Palestinian health system refers to the governmental and private healthcare providers to people living in the Palestinian territory (West Bank and Gaza) have access (Gordon, 1997). The current system is facing many challenges on top of these changes is the Israeli occupation of Palestinian land (World Health Organization, 2013). The health system in the occupied Palestinian territory is operating under severe pressure hence increasing the risk of illness and diseases. Among these challenges are the rapid population growth, lack of economic opportunities, shortages in adequate financial resources, and shortages in basic supplies of medicines (World Health Organization, 2016).

The number of healthcare centers in the various governorates of the country has increased from 454 in 1994 to 739 in 2016 reflecting an increase of 62.8% since 1994 (Ministry of Health, 2017).

An analysis to the health system in Palestine reveals four major suppliers: These are the (1) Public Sector, (2) UNRWA, (3) NGOs and (4) Private Sector.

### **2.4.1 UNRWA**

UNRWA is a United Nations agency established by the General Assembly in 1949 and mandated to provide assistance and protection to some 5 million registered Palestine refugees. Its mission is to help Palestine refugees in Jordan, Lebanon, Syria, West Bank and the Gaza Strip achieves

their full human development potential, pending a just and lasting solution to their plight. UNRWA services encompass education, health care, relief and social services, camp infrastructure and improvement, protection and microfinance (UNRWA, 2018).

For over 60 years, the UNRWA Health Program has been delivering comprehensive primary health care (PHC) services, both preventive and curative, to Palestine refugees, and helping them access secondary and tertiary health care services. UNRWA beneficiary populations are undergoing a demographic transition: People are living longer and developing different needs, particularly those related to non-communicable diseases (NCDs) and chronic conditions that require lifelong care, such as diabetes, hypertension and cancer. The UNRWA program traces health services from infancy to old age. Thus their program takes a 'life-cycle approach' in providing its package of preventive and curative health services (UNRWA, 2015).

UNRWA provides primary care services, only for refugee and purchase secondary care services for the hardship cases, NGOs provide primary, secondary and some tertiary services, Private for-profit sector provides the three level of care through a variety of specialized hospitals and investigation centers (World Health Organization, 2006).

### **2.4.2 Governmental (Public) Sector**

The public health sector is considered the largest in terms of capacity. The government health insurance program is the main health financing mechanism for this public health sector. It is important to note that health insurance is compulsory for the public sector employee and voluntary for the remaining population (World Health Organization, 2016). It has been reported that the share of the public sector in total health expenditure represents about 32% of all total health care expenditure in the Palestinian territories (Hamdan, 2002).

Among the services provided include reproductive, maternal, newborn and child health services are available free of charge at Ministry of Health primary care facilities. In addition the number of governmental hospital arrived 27 in 2016 (Palestinian Central Bureau of Statistics, 2018).

### **2.4.3 NGOs**

Since the Oslo accord in 1993, the Palestinian arena has witnessed major changes that have left their mark on all aspects of Palestinian society (Abuiyada and Abdulkarim, 2016).

The NGO sector is not an exception in this sense (Abuiyada and Abdulkarim, 2016) by (Hamami, 1998). Before the Oslo agreement and the emergence of the Palestinian Authority, the NGO sector was tied with the PLO political factions, particularly in the case of the grassroots

organizations which represented an extension of the communist party (Abuiyada and Abdulkarim, 2016).

Funding was mainly secured from the Palestinian National Fund which used to get donations from Arab governments and levies of 5% of the Palestinian wages in the Gulf countries (Abuiyada and Abdulkarim, 2016).

The NGOs are a non-governmental organization which plays an important role in service delivery, especially in providing tertiary, ambulatory and rehabilitative care services (World Health Organization, 2016).

Also it has been reported that in 2014, the nongovernmental organizations operated 137 PHCCs (129 in the West Bank and 8 in Gaza Strip) and 34 hospitals (20 in the West Bank and 14 in Gaza Strip), supplying about one-third of bed availability in the occupied Palestinian territory. As we can see these institutions are important providers especially for mental health counseling, physical therapy and rehabilitation (World Health Organization, 2016).

#### **2.4.4 Private Sector**

In 2014 there were 16 private hospitals, supplying 8.6% of bed capacity, as well as pharmacies, laboratories and rehabilitation center which could play an important role in health services delivery in Palestine (World Health Organization, 2016).

## **2.5 Ministry of Health Services**

There is a wide range of services provided by the Ministry of Health aimed at reducing the risk in the health sector. According to the annual report for 2016 (Ministry of health, 2017), there are very extensive health services covered by the Palestinian health system. Among those services are:

(1) Primary Health Care Services: there are around 739 primary health care services (PHC) in Palestine in 2016, 587 are in West Bank and 152 in Gaza Strip.

(2) Child Health care services which include providing maternity (Prenatal and Postpartum) and child care.

(3) School Health Care Services which provides medical services for Palestinian school students, especially preventive ones like vaccinations.

(4) Mental Health care Services which includes 16 specialized psychiatric and community health clinics in West Bank

(5) Oral and Dental Health Care Services

(6) Environmental Health Care Services which includes deferent activities like tested food and water samples, and matching factories to health and environmental conditions

(7) Health Education Services which include teams provide health education in deferent places like schools, clinics, hospitals and other places.

(8) Secondary and Tertiary Health Care Services which in 2016 included 81 hospitals in Palestine including East Jerusalem hospitals.

As a result there was 6146 hospital bed in Palestine (including psychiatric and neurological hospitals), with rate of 784 populations per bed, including East Jerusalem hospital beds; the rate was 784 population per bed in the Gaza Strip and 783 populations per bed in West Bank (Ministry of health, 2017).

The country has a well-established vaccination program, with no known pockets of unvaccinated children and very high coverage of measles and DPT3 vaccines (World Health Organization, 2016). The maternal mortality ratio declined by 61.9% between 1990 and 2015 from 118 to 45 per 100 000 live births (World Health Organization, 2016) by (Ministerial Committee for the Reconstruction of Gaza, 2015) and the under-5 mortality ratio decreased from 43 to 21 deaths per 1000 live births (World Health Organization, 2016). Life expectancy for males is 71.5 and females is 74.4 (World Health Organization/ Regional Office for the Eastern Mediterranean, 2016). In 2010, the ageing population, above 60 years, represented 4.4% of the total population (World Health Organization/ Regional Office for the Eastern Mediterranean, 2016).

## **2.6 Women health indicators statistics for the year 2016**

1. Rate of women of childbearing age of total population (23.8 in Gaza and 25.4 in Wes Bank) (Ministry of Health, 2017).

2. The estimates point to a decline in the crude birth rate during the last decade in the Palestinian Territory. The birth rate had been estimated at 42.7 births per one thousand of the population in 1997 and declined to 32.8 in 2011. There is discrepancy in the crude birth rate in 2011 in both the West Bank and Gaza Strip, which was 30.1 and 37.2 respectively (Palestinian Central Bureau of Statistics, 2012).

Based on the General Population, Housing and Establishment Census 2017, the crude birth rate in Palestine has declined to 30.7 births per 1,000 population in 2017 compared to 32.8 births per 1,000 population in 2010, possibly due to low fertility levels and implement reproductive health programs in family planning (Palestinian Central Bureau of Statistics, 2018).

At the regional level, there is a difference in the crude birth rate for both the West Bank and the Gaza Strip. In the West Bank, there were 28.1 births per 1,000 populations during the year 2017 versus 30.1 per 1,000 births during the year 2010, while the overall birth rate in the Gaza Strip declined to 34.7 births per 1,000 populations within a year 2017, versus 37.1 births per 1,000 populations during the year 2010.

3. Total fertility rate in Palestine have been decreasing since 1997 to 2014, Which decreased from 6.1 births per woman (6.9 in Gaza Strip and 5.6 in the West Bank) to 4.1 births per woman in the period 2011- 2013 (4.5 in Gaza Strip and 3.7 in the West Bank) (Palestinian Central Bureau of Statistics, 2018).
4. Incidence of anemia among pregnant women registered in the PHC centers is 28.2%, of which mild anemia (hemoglobin 9 to 11 gm/ dl) is 26.6% of pregnant women, while moderate anemia (hemoglobin 7 to 8.9 gm/ dl) was 1.5% among pregnant women, while those with severe anemia (hemoglobin less than 7 gm/ dl) were 0.1% of all pregnant women registered in PHC centers, percentage of deliveries in health institution is 99.9% and 0.1 % of deliveries at homes (Ministry of Health, 2017).
5. Infant mortality rate is a measure of the overall social and health situation in the country infant and under-five mortality rates in Palestine over the past decade and a half has declined. Infant mortality rate declined from 25.5 deaths per 1000 live births in year 2000 to 18.2 deaths per 1000 live births during period 2009-2013(Palestinian Central Bureau of Statistics, 2018).
6. Maternal mortality rate has been decreased from 38/ 100,000 live births in the year 2009 to 12.4/100000 in the West Bank and 15.5/100000 live births in Gaza in the year 2016 (Ministry of Health, 2017).



7. The rate of Breast cancer is 33.9% of all cancer cases among women, breast cancer mortality rate is 24.7% among all cancers, also it's the most common cause of death among females (Nazzal et al, 2016).

## **2.7 Mortality rate in Palestine**

The mortality level in Palestine is relatively low compared with the current mortality rates in the Arab countries (Palestinian Central Bureau of Statistics, 2012).

Crude mortality rates in Palestine dropped from 4.1 per 1000 population in 2010 to 3.5 per 1000 population in 2016. Regionally disaggregated, there are variances between the West Bank and the Gaza Strip since this rate in the West Bank was estimated at 4.2 in 2010 and decreased to 3.7 deaths per 1000 population in 2016 while in the Gaza Strip it declined from 4.0 deaths per 1000 population in 2010 to 3.3 in 2016. This could be an indicator of improved quality of life and better access to medical service in addition to improved health awareness and development of health services (Palestinian Central Bureau of Statistics, 2017).

## **2.8 Common causes of deaths in Palestine**

An investigation to the health profile of the Palestinian it shows that heart disease was the leading cause of death in the West Bank in 2014, causing 31.2% of all reported deaths, where as the cancer was the second cause accounting for 14.2% of reported deaths, followed by

cerebrovascular diseases 11.3%, diabetes mellitus 8.9% and infant diseases and prenatal conditions 5.2% (World Health Organization, 2016).

There are too many causes for death in Palestine, where Non-communicable diseases were responsible for deaths. The burden of non-communicable diseases in the West Bank causes 74.9% of all deaths. Most common causes of deaths in Palestine according to (World Health Organization, 2016) are:

1. Cardiovascular diseases account (44.2%).
2. Cancer (18.3%).
3. Diabetes mellitus (1.2%).

### **2.8.1 Cardiovascular diseases in Palestine**

Hypertension, diabetes mellitus, and tobacco smoking are the main risk factors for cardiovascular disease in occupied Palestinian territory; they result in substantial direct morbidity and mortality. The few available data for cardiovascular disease in the occupied Palestinian territory have been obtained mostly from household surveys and data from death notification, and they indicate a high incidence and prevalence of cardiovascular disease and hypertension (Husseini et al, 2009).

In 2005, cardiac disease (ischemic, rheumatic, pulmonary, and other heart diseases) was reported to be the number one cause of death in the occupied Palestinian territory, accounting for 56.5 deaths per 100 000 people and

21.0% of all deaths, cerebrovascular disease was the next most common cause, accounting for 29.8 deaths per 100 000 people and 11.0% of all deaths; it was the second leading cause of death in women (12.4% of all deaths) and the third in men (9.9% of all deaths). Hypertension was ranked eighth, accounting for 13.0 deaths per 100 000 population and about 5% of all deaths (Husseini et al, 2009).

Analysis of mortality data for people aged 40 years and older in the West Bank only for 1999–2003 showed that the age-standardized mortality rate for acute myocardial infarction was 78.5 per 100 000, which is by far the most important cause of death (Husseini et al, 2009) .

The mortality rate from acute myocardial infarction in Palestinian men was more than twice that in women. The rate for heart failure was 35 per 100 000 men and 32 per 100 000 women. Number of deaths resulting from cerebrovascular disease was 41 per 100 000 men and 35 per 100 000 women. In 2006, the rate of heart disease in Palestinians living in the occupied Palestinian territory was 2.1% at age 40–49 years and 12.1% at 60 years and older (Husseini et al, 2009).

In 2006, the rate of reported hypertension was 8.1% at age 40–49 years, 22.6% at 50–59 years, and 35.2% at 60 years and older.<sup>7</sup> In two population-based cross-sectional studies done in 1996–98, the rate of hypertension ranged from 21.5% to 25.4% in adults aged 30–65 years in two communities in the West Bank, data routinely gathered by the UN Relief and Works Agency showed that the rate of hypertension was 14.3%

in people aged 40 years and older in the West Bank, and 17.4% for registered Palestinian refugees in the Gaza Strip (Husseini et al, 2009).

## **2.8.2 Cancer in Palestine**

In 2016, in Palestine cancer deaths were 14.0% of the total reported deaths with 53.8% of deaths among males, and 46.2% among female. In 2015, the cancer mortality rate was 13.8% of all deaths recorded in Palestine, More specific In 2016, the total number of new reported cancer cases in West Bank were 2,536 representing an increase of 5.7% from the 2,400 death reported cases in 2015(Ministry of Health, 2017).

### **2.8.2.1 Most common types of cancer in the West Bank**

**According to** (Ministry of Health, 2017):

- The first type of cancer in the West Bank is the breast cancer.
- Breast cancer cases accounts for 388 cases (15.3% of total reported cancer cases).
- Breast cancer accounted for 28.9% of the total reported cancer cases among Palestinian female.
- The second type of cancer in the West Bank is the colorectal cancer with 262 cases, which accounts to 10.3% of all reported cancer cases.
- The third type of cancer in the West Bank is leukemia with 214 new cases, which is 8.4% of the total reported cancer cases.

- Lung cancer was ranked the first among reported cancer cases among males which accounts for 13.6% of all reported cancer cases among Palestinian males in West Bank.

## **2.9 Mortality rate among children under five years old**

Under-five mortality in Palestine has declined from 28.7 deaths per 1000 live births in year 2000 (27.2 deaths per 1000 live births in the West Bank and 31.2 deaths per 1000 live births in the Gaza Strip) to 21.7 deaths per 1000 live births during the period 2009-2013 (20.1 deaths per 1000 live births in the West Bank and 23.7 deaths per 1000 live births in the Gaza Strip) (Palestinian Central Bureau of Statistics, 2018).

## **2.10 Mental and psychiatric health**

Regarding the mental health services in Palestine, there are 6 specialist psychiatric and community health clinics in West Bank. The number of new cases registered in 2016 is 2712 in West Bank, with an incidence rate of 101.6 per 100,000 populations (Ministry of Health, 2017). There are 42 outpatient mental health facilities available in The West bank and Gaza , these outpatient facilities treat 33,167 users in 2004 (911.8 users per 100,000 population), the users treated in outpatient facilities are primarily diagnosed as suffering from neuroses, stress-related disorders and somatoform disorders (35%); and other disorders like epilepsy, organic mental disorders, mental retardation, behavioral and emotional disorders (35%); mood disorders (12%); schizophrenia (12%); and approximately

6% are diagnosed with personality or substance abuse disorders (World Health Organization, 2006).

There are two psychiatric hospitals available in the territory, for a total of 319 beds (8.76 beds per 100,000 population) twenty-seven percent of patients spend less than one year in the psychiatric hospital, 12% spend 1-4 years, 17% spend 5-10 years, and 44% percent of patients spend more than 10 years in mental hospitals (World Health Organization, 2006).

### **2.10.1 Challenges that face mental health services in Palestine**

There are several challenges which face the mental health services in Palestine. These challenges include lack of safety and freedom; lack a sense of injustice inside and outside the health workplaces, financial, economic, transport problems, the effect of the separation wall in the employees' village, low level of formal support for nursing and nursing development, especially from their employers and nursing association, inconsistency of care services due to lack of health care supplies and instability within health care services (Marie et al, 2017).

Other challenges include lack of public and health professionals' awareness of, plus considerable social stigma towards, mental illness, lack of human resources, learning opportunities, and supervision or guidance, plus poor facilities and infrastructure and a lack of financial resources (Marie et al, 2016).

Organizational changes which face mental health services include gaps between theory and practice, professional status of nursing, lack of clarity over work roles (Marie et al, 2017).

### **2.10.2 Mental health needs in Palestine**

There is a necessity to increase the availability and quality of mental health care. Mental health policy and services in Palestine need development in order to better meet the needs of service users and professionals. There is also to raise awareness of mental health and increase the integration of mental health services with other areas of health care. Regarding the needs of the civilians, there is a need for their human basics to be met, including having freedom of movement and seeing an end to the occupation. There is also need to enhance the resilience and capacity of community mental health teams. Other needs include increasing the resources and offer more support, up-to-date training and supervision to mental health teams (Marie et al, 2016)

### **2.11 Hospitals in Palestine**

Regarding the number of hospitals in Palestine, the Ministry of Health owns and manages 63.1% of the beds of general hospitals in Palestine, 39.2% of the beds of specialized hospitals, 14.5% of the maternity beds, and all mental and psychiatric beds. Regarding the Non-Ministry of Health Hospitals in 2016 the number of non-Ministry of Health hospitals in Palestine reached 54, with a total bed capacity of 2,821 beds,

representing 45.9% of the total hospital beds in Palestine (Ministry of Health, 2017).

## **2.12 Population and workforce**

The ministry has reported that by 2016 that the total numbers of health workers in Palestine were estimated at 13180 workers (Ministry of health, 2017).

The number of employees of the NGO sector was found to be 6,390 individuals with a Full Time Equivalent of 7,102 while the number of employees of the Private sector was 7,636 individuals with a Full Time Equivalent of 7,341. Results also showed that the number of nurses in the NGO sector amounted to 1,737 with a Full Time Equivalent of 2,107 (Palestinian Central Bureau of Statistics, 2006).

The MOH remain the main employer of the health sector with 41.0% of all health sector employments taking place at MOH sites, followed with the Private and then the NGOs sectors with 27.0% and 26.0% of all employments, respectively. UNRWA came last with 6.0% of all health sector employments (Palestinian Central Bureau of Statistics, 2006).

The Ministry of Health (MOH) in Palestine is the largest employer of human resources working in the health sector in Palestine. In 2016 the number of medical staff working in MOH reached 8,723, including the supporting medical professions, which accounted for 61.2% of the total number of employees in the MOH, in addition to 5,525 employees working



in the field of administration and services, representing 38.8% of the total workforce in MOH. The types of workers in MOH include physicians, pharmacists, nursing and midwifery, allied medical professions, administration and services (Ministry of Health, 2017).

### **2.13 Palestinian Population Nature**

It is noted that the Palestinian population is a young one. The percentage of individuals in the age group 0-17 years was 46 percent, whereas the percentage of individuals in the age group 18 and above was 54 percent. According to economic and social dependency categories, 39 percent individuals were in the age group 0-14 years, 58 percent in the age group 15-64 years which is the age category of economically active individuals; and 3 percent in the age group 65 years and over. The average household size in Palestine in 2014 was about 5.5 persons. About 91 percent of households are headed by men and about 9 percent of households are headed by women (Palestinian Central Bureau of Statistics, 2015).

### **2.14 Conclusion**

The Palestinian health situation faces many challenges under the oppressive Israeli occupation which deprives the Palestinian citizens of their rights and violates all international treaties. In this study public health expenditure was selected to be as a dependent variable because the current study topic is interested to tackle the issue of public health expenditure as

an outcome. The independent variable is the per capita income, population and health outcomes.

## **Chapter Three**

### **The Literature Review**

## **Chapter Three**

### **The Literature Review**

#### **3.1 Introduction**

This literature review chapter displays a review of literature regarding public health expenditure and its effect on public health care system in Palestine. The aim of this chapter is to provide foundation of knowledge on thesis topic and identify areas of prior scholarship to prevent duplication and give credit to other researchers.

#### **3.2 Health expenditure**

The subject of health expenditure growth and determinants has received the attention of all types of researchers in the field of medicine, sociology, health economics and risk management. According to the Organization for Economic Co-operation and Development (OECD) healthcare expenditures or outlays consists of all for medical care, prevention, promotion, rehabilitation, community health activities, health administration and regulation and capital formation with the predominant objective of improving health (Deluna and Peralta, 2014).

The subject of health expenditure growth and determinants have received the attention of all a large body of research on the determines the quantity of medical care services in any country have shown that there is a strong and positive relationship between health care spending and gross domestic product (GDP) which means a significant percentage of changes

in per capita health care expenditure (across countries and in time) could be explained by variations in per capita GDP (Cantarero, 2005).

### **3.3 Studies related to health care expenditure growth and its determinants**

In analyzing the determinants of public health care expenditure in Spain, results showed that aging population as the most important determinant in the explanation of the health care expenditure in Spain. Other variables such as regional income and the relative structural characteristics of the supply variables have less significance (Cantarero, 2005).

Anyanwu and Erhijakpor (2009) pointed in their study that an expansion in the public health care services amounts to a greater perceived reduction in the prices of health care services, which may result in more consumption of health care services.

Gyimah-Brempong and Wilson (2004) argued in their paper done in Africa that a healthy person can work more effectively and efficiently and also can devote more time to productive activities. The study found that GDP is positively affected by health capital indicators. The study found that an increase of four percent in economic growth could increase the life expectancy one year more (Anyanwu and Erhijakpor, 2009).

Another study on the rapid changes in healthcare system found that challenges of changing demographics, disease patterns, emerging and re-emerging diseases coupled with rising costs of health care delivery have forced a comprehensive review of health systems and their functioning (World Health Organization, 2006).

### **3.4 Health care system in Palestine and other countries**

The health care system in Palestine is considered still under development; hence for effective health policy development and planning in Palestine, it is critically important to analyze the current health care spending by examining patterns of spending and utilization of health services in Palestine (Hamidi et al, 2015).

For any country, the amount of health expenditure the country spent is one of most important indicators of its development and that good policies and institutions are important determinants that influence the impact of government health expenditures and outcomes (Boyacioğlu, 2012).

#### **3.4.1 Palestinian health funding sources**

There are 3 main sources of finance for the health system of the OPT: public; private; and the rest of the world, the government acts as the main public financing source, it comprises all institutional units of central and local government including the MOH and Military Health Services via the Ministry of Finance ( Hamidi et al, 2015).

Non-profit institutions that are controlled and mainly financed by government units are also included. Private sources include private insurance enterprises, private household out of-pocket expenditure and non-profit institutions serving households, none of which belong to the government sector (Hamidi et al, 2015).

The “rest of the world” category represents the list of projects that support the health sector as registered in the Ministry of Planning. These projects cover primary and secondary health care activities from a variety of donors. The projects also fund special vertical programmes, such as the tuberculosis programme and maternal and child health, and capital infrastructure establishments (Hamidi et al, 2015).

Other studies (Kim and Lane, 2013) have reported that the impact of government spending on health has a mixed, but most studies leans toward having a positive outcomes from increased public spending.

Another study pointed out that to improve life expectancy and to reduce child mortality rates; it requires effective and sufficient health expenditure and a sustainable economic growth (Deluna and Peralta, 2014). Other studies found that health expenditure reduces childhood mortality rates (Boyacioğlu, 2012) and that increased government spending contributed to positive outcomes in under-five and maternal mortality (Kim and Lane, 2013).

On the other hand, some studies (WHO, 2001) clarified that spending on health has a positive effects on economic whereas by increasing life expectancy at birth by 10% will increase the economic growth rate by 0.35% a year. Other studies have reported that a poor health system will have a heavy financial burden within any country (Deluna and Peralta, 2014).

It has been reported that 50% of the growth differential between rich and poor countries is due to ill-health and life expectancy (Anyanwu and Erhijakpor, 2009).

Other studies highlighted the importance of investing in health in terms of economic, this study found that health capital indicators positively influence aggregate output, they estimated that 22% to 30 % of growth rate is attributed to health capital and improvements in health conditions equivalent to one more year of life expectancy are associated with higher GDP growth of up to 4 % points per year (Boyacioğlu, 2012).

Although some studies have found positive effects of government spending on the health sector, but other studies did not find a significant outcomes. In Boyacioğlu study (2012) it has been shown that additional medical care utilization is relatively ineffective in lowering mortality and increasing life expectancy. The study also found that most important factors that influence death rates are related to socioeconomic status and lifestyle. The study suggests that health care policy which focuses primarily on the provision of medical care services and ignores larger economic and



social considerations may do little to benefit the nation's health (Boyacıoğlu, 2012).

In support of this argument it has been reported by (Boyacıoğlu, 2012) that the impact of public spending on health is quite small, with a coefficient that is typically both numerically small and statistically insignificant at conventional levels.

### **3.5 Studies related to Palestine**

There are very few published studies analyzing and describing the patterns of spending and utilization of health services in Palestine (Hamidi et al, 2015). Further increases in government spending on health occurred after 2006, in line with the vision of the MOH to promote the health of Palestinians and to aid the poorest members of the population (Hamidi et al, 2015). Between 2000 and 2006, MOH allocations represented between 8% and 11% of total public funds (Hamidi et al, 2015). In 2013, the budget of the MOH (US\$ 531 million) accounted for about 13% of the overall government budget (US\$ 3900 million) (Hamidi et al, 2015).

One study found that overall health expenditures (public and private) more than tripled in the last decade, reaching US\$1.3 billion in 2012, or 12 percent of gross domestic product (GDP)—one of the highest shares of GDP in the world, while in France spending on health reach 11.7 percentage of GDP (World Bank 2016). Even with this high spending on health in Palestine, the same study clarified that health outcomes are below

potential for current levels of spending. This study explained the reasons of rise in public spending on health is being driven mainly by the salary bill, the cost of medical referrals outside the public health system, and high spending on pharmaceuticals (Word bank, 2016).

### **3.6 Other studies**

Martin study reviews the literature on determinants of healthcare expenditure for the period 1998 to 2007. It was found that income level is the principal determinant of healthcare expenditure. Other variables of importance are population ageing, decentralization of healthcare and technological progress is increasingly seen as important variables used in the development of explanatory models of healthcare expenditure (Martin et al, 2010).

Freeman paper used the co integrating relationship among income level and other key health care variables, it has found that the paper uses dynamic co integrating regressions of the pooled state time series on United States of America (USA) dataset of health care expenditures and disposable personal income for the years 1966–1998 is used to estimate the income elasticity of health care, the study found that the income elasticity of health care and found it to be between at 0.817 to 0.844, well below unity, confirming that health care expenditure, even at the aggregate level, is a necessity good (Freeman, 2010).

Hartwing and Sturm study used data on 33 OECD countries (Organization for Economic Co-operation and Development (OECD)) to examine the determinants of health care expenditure growth over the period 1970–2010. The study used all macroeconomic and institutional determinants of health care expenditure. The obtained results showed that GDP growth statistically significant determinants of health care expenditure (HCE) growth. Other important variables used include the growth in expenditure on health administration, the change in the share of inpatient expenditure in total health expenditure, the (lagged) government share in GDP, the change in the insurance coverage ratio, the growth in land traffic fatalities and the growth in the population share undergoing renal dialysis (Hartwing and Sturm, 2014).

Erdil and Yetkiner study investigates the Granger-causality relationship between real per capita GDP and real per capita health care expenditure by employing a large macro panel data set with a Vector Autoregressive (VAR) representation (Erdil and Yetkiner, 2011).

The result of Erdil and Yetkiner study show that one-way causality generally runs from income to health in low- and middle-income countries whereas the reverse holds for high-income countries. Accordingly, care must be paid in defining the dependent and independent variables when specifying the determinants of health care expenditure (Erdil and Yetkiner, 2011).

The focus of Taşkaya and Demirkiran study was to evaluate the causality between healthcare resources and health expenditure in Turkey over the period from 1975 to 2013. The data used was collected from Turkstat, World Bank Indicators and OECD Health Data. The papers used the Granger Var method was used to investigate causality between variables. The empirical modeling was based on how GDP per capita, the number of doctor and number of hospital beds had an impact on the growth of health spending per capita (Taşkaya and Demirkiran, 2016).

The objective of Ang paper is to examine the long-run relationship and short-run dynamics of the health care expenditure in Australia during the period 1960–2003. The study found that the income elasticity for health care is found to be greater than one, suggesting that health care is a luxury good in Australia. Demographic structure is found to a significant positive impact on health care expenditure (Ang, 2009).

# **Chapter Four**

## **Research Plan and Methodology**

## **Chapter Four**

### **Research Plan and Methodology**

This chapter deals with the research plan and methodology that will be used in completing this thesis. It will also include the data and the variables needed for analysis as well as their sources. Also it will include the model specification which will be used to estimate the relationship between total expenditure on health care by the government and health outcome variables as well as the economic variable.

This study will utilize regression analysis as a statistical tool to study the effect of total expenditure on health care by the government in reducing the risk in the public health care system in Palestine. The use of the regression study is very useful for estimating the relationship among the variables.

#### **4.1 Data and Variables**

The data which have been used in the analysis is obtained from the Palestinian Central Bureau of Statistics. The data covers the period from 2000-2015 (table of data founded in appendix 1).

##### **4.1.1 Dependent Variable**

- The total expenditure on health care by the government (THLEX). This independent variable was chosen because the current study topic interested to discuss this issue as an outcome.

#### **4.1.2 Independent or Explanatory Variables**

- Health outcomes variable
- Demographic variables
- Economic variable

##### **B.1 Health variable**

This study use one economic variable which is Life expectancy at birth (LEXP): The variable for Life expectancy at birth will be giving a symbol of (LEXP). In this research, life expectancy at birth is defined as how long, on average, a newborn can expect to live, if current death rates do not change (OECD, 2018).

##### **B.2 Economic variable**

This study use one economic variable which is Per Capita Income and will be given a symbol of PCI. This variable measure the amount of money earned per person in a certain area. It can apply to the average per-person income for a city, region or country; it can be calculated for any country by dividing the country's national income by its population (Investopedia, 2018).

### **B.3 Demographic variables**

This study uses three demographic variables which is

1. Population size. This variable will given a symbol of POP. This variable measure the whole number of people in a country or region.
2. Total fertility rate (TFR): The symbol listed for this total Fertility rate (TFR). This variable is defined as, “the average number of children a women would have assuming that current age-specific birth rates remain constant throughout her childbearing years. This means total fertility rate is the average number of children a woman would have if she survives all her childbearing (or reproductive) years. Childbearing years are considered age 15 to 49 (**Carlson, 2014**).
3. Crude birth rate (CBR): This variable will be given a symbol as CBR. In this research, crude birth rate is a health variable and it referring to deaths among a population in a given period; Crude Death Rate refers to the number of these deaths per 1,000 persons in a given year (Palestinian Central Bureau of Statistics, 2012). The most well known measure is the crude birth rate, which is the number of births that occur each year per 1,000 people in the midyear population. It is called “crude” because it does not take into account the possible effects of age structure (Crossman, 2018). Total birth rates are different from total fertility rates in that the denominator is not the total number of women ages 15 to 44, but rather those belonging to a specific age group (Child Trends, 2018).



Our objective is to assess the linkages between the health outcomes, the economic variable, and the demographic variable and their impact on the dependent variable which was defined previously as total expenditure on health care by the government (THLEX).

## **4.2 Study Framework**

The study plan is based on three main frameworks as follows:

### **(1) The general and theoretical framework**

It includes the theoretical study about conceptual and theoretical backgrounds related to the study topics beside related case studies.

### **(2) Information and Database framework**

It includes necessary data and information about the experience and practices of health expenditure in Palestine. The basic health and economic data will be collected from the Palestinian Central Bureau for Statistics (PCBS) for several years.

### **(3) Analytical framework**

The analysis will be conducting by using the SPSS software to assess the result, and to test the hypothesis and provide recommendations concerning the linkages between the health and economic outcomes as the independent variables and the health expenditure outcomes as the dependent variable in Palestine. The analysis will be made based on the theoretical and informational frameworks adopted in this research.

This study will follow the following scientific methodological approaches:

- \* Historical Approach: to be used in the theoretical framework.
- \* Descriptive Approach: to be used in the database framework.
- \* Analytic and Deductive Approach: to be used in the analytical framework.

### **4.3 Sources of Data**

The data and information used in this study will rely on available resources of the data. These data are secondary while mean it has been published by official institution like the Palestinian Central Bureau of Statistics.

- 1) Libraries sources: all available references, books, thesis, articles, etc: we will utilize to summarize previous studies on the same subject.
- 2) Official and unofficial sources: available studies, reports, projects in the related ministries, research centers, civil institutions, and universities).
- 3) Electronic and Internet sources: various internet website contains a variety of information and data that can be utilized in this research.
- 4) The Palestinian Central Bureau for Statistics (PCBS): there is an official website for the statistics of Palestine, and it that all official data related to the health and economy of Palestine.

#### 4.4 Model Specification

Based on the above identification of the variables, our models which will be estimated follow several functional formats. The total numbers of models which will be estimated are eight. Below is a discussion for each model of the utilized independent variables.

##### Model One

$$\text{THLEX} = f(\text{POP}, \text{PCI}) \dots \dots \dots (1)$$

$$\text{And in linear form it is } \hat{\text{THLEX}} = \hat{\alpha} + \hat{\beta}_1 \text{PCI} + \hat{\beta}_2 \text{POP} + \hat{e}_i \dots \dots \dots (1.1)$$

##### Model Two:

$$\text{Log (THLEX)} = f(\text{Log LEXP}, \text{Log POP}, e_i) \dots \dots \dots (2)$$

$$\text{And in linear form it is } \text{Log } \hat{\text{THLEX}} = \hat{\alpha} + \hat{\beta}_1 \text{Log LEXP} + \hat{\beta}_2 \text{Log POP} + \hat{e}_i \dots \dots \dots (2.1)$$

##### Model Three

$$\text{Log (THLEX)} = f(\text{Log LEXP}, \text{Log PCI}, e_i) \dots \dots \dots (3)$$

$$\text{And in linear form it is } \text{Log } \hat{\text{Thlex}} = \hat{\alpha} + \hat{\beta}_1 \text{Log LEXP} + \hat{\beta}_2 \text{Log PCI} + \hat{e}_i \dots \dots \dots (3.1)$$

**Model Four**

$$\text{Log (THLEX)} = f (\Delta\text{Log(TFR)}, \text{Log(POP)}, \text{ei}) \dots\dots\dots (4)$$

$$\text{And in linear form it is } \text{Log } ^\wedge\text{THLEX} = \hat{\alpha} + \hat{\beta}_1 \Delta\text{Log(TFR)} + \hat{\beta}_2 \text{Log (POP)} + \hat{\text{ei}} \dots\dots\dots (4.1)$$

**Model Five**

$$\text{Log (THLEX)} = f (\Delta\text{Log(LEXP)}, \text{Log(POP)}, \Delta\text{Log(CBR)}, \text{ei}) \dots\dots\dots (5)$$

And in linear form it is:

$$\text{Log } ^\wedge\text{THLEX} = \hat{\alpha} + \hat{\beta}_1 \Delta\text{Log(LEXP)} + \hat{\beta}_2 \text{Log (POP)} + \hat{\beta}_3 \Delta\text{Log(CBR)} + \hat{\text{ei}} \dots\dots\dots (5.1)$$

**Model Six**

$$\text{Log (THLEX)} = f (\text{Log(POP)}, \Delta\text{Log(CBR)}, \text{ei}) \dots\dots\dots (6)$$

And in linear form it is:

$$\text{Log } ^\wedge\text{THLEX} = \hat{\alpha} + \hat{\beta}_1 \text{Log (POP)} + \hat{\beta}_2 \Delta\text{Log(CBR)} + \hat{\text{ei}} \dots\dots\dots (6.1)$$

**Model Seven**

$$\text{Log (THLEX)} = f (\text{Log (TFR)}, \text{Log(PCI)}, \text{Log(CBR)}, \text{Log(LEXP)} \text{ei}) \dots\dots (7)$$

And in linear form it is:

$$\text{Log } ^\wedge\text{THLEX} = \hat{\alpha} + \hat{\beta}_1 \text{Log (TFR)} + \hat{\beta}_2 \text{Log (PCI)} + \hat{\beta}_3 \text{Log(CBR)} + \hat{\beta}_4 \text{Log(LEXP)} \dots\dots\dots (7.1)$$

**Model Eight**

$$\text{Log (THLEX)} = f (\text{Log (TFR)}, \text{Log(PCI)}, \text{Log(CBR)} \text{ ei}) \dots \dots \dots (8)$$

And in linear form it is:

$$\text{Log } \hat{\text{THLEX}} = \hat{\alpha} + \hat{\beta}_1 \text{Log(TFR)} + \hat{\beta}_2 \text{Log(PCI)} + \hat{\beta}_3 \text{Log(CBR)} + \hat{\text{ei}} \dots (8.1)$$

## **Chapter Five**

### **Results and Findings**

## Chapter Five

### Results and Findings

This chapter summarizes the empirical result of all models used in this research when each model will be reported separately. Each model will have its functional form as well its linear equation. The goal is to obtain estimates for the relationship between the dependent variable and each of the independent variables which were specified in the previous chapter for the purpose of analysis the regression model was used. This regression analysis will indicate the significance relationship between the dependent variable and the various independent variables. It also indicates the strength of impact of multiple independent variables and dependent variable.

#### First, Model One

Model one was specified as  $THEX = f(PCI, POP, e_i)$ ..... (1)

And in linear form it is  $\hat{THLEX} = \hat{\alpha} + \hat{\beta}_1 PCI + \hat{\beta}_2 POP + \hat{e}_i$ ..... (1.1)

The statistic results of model one is presented below in table (1).

**Table (1): Regression Analysis of the Relationship Between the Dependent Variable Total Expenditure on Health Care by the Government (THLEX) and Two Independent Variables: Population Size (POP) and Per Capita Income (PCI)**

Independent Variables	Estimated Coefficient	Standard Error	T value	Probability
Constant $\hat{\alpha}$	-602856.4	93573.85	-6.442574	0.0000
PCI Coefficient $\hat{\beta}_1$	96.45348***	30.88862	3.122622	0.0081
POP Coefficient $\hat{\beta}_2$	0.193514***	0.038279	5.055308	0.0002
R-squared= 0.979154 Adjusted R-squared= 0.975947 F-statistic= 305.3157 Prob(F-statistic)= 0.000000				

\*\*\* Significant at 1%

Source: E view Estimate

\*\* Significant at 5% level

\*Significant at 10% level

Table (1) provides the finding for model (1) by showing the statistical results for both the intercept ( $\hat{\alpha}$ ) and the slope ( $\hat{\beta}$ ) for the two independent variables.

Our dependent variable is total expenditure on health care by the government (THLEX). The table shows that per capita income coefficient is equal 96.45 and it is both significant at the one percent level and also it is positive as expected. At the same time, the coefficient of population is



equal to 0.1935 which is also positive as expected and it is significant at the one percent level.

Table (1) also shows the value of R-squared which is equal to 97.9%. This means that both PCI and POP variables were able to explain about 97.9% of the total variation in the dependent variable total expenditure on health care by the government (THLEX). The reported adjusted R-squared is 97.5% which is always lower than R-squared value. This means about 2.5% of adjusted R square can be attributed to other factors.

The purpose of the F statistic is to show if the model is well specified or not. Our reported F value in table (1) is equal to 305.3157 which is very high and is significant at the 1% level. This means our model is well specified and has a strong explanatory power of the total variation in the total health expenditure.

## **Second, Model Two**

Model two was specified as  $\text{Log (THLEX)} = f(\text{Log LEXP, Log POP, } e_i)$   
 ..... (2)

And in linear form it is  $\text{Log}^{\wedge}\text{THLEX} = \hat{\alpha} + \hat{\beta}_1 \text{Log LEXP} + \hat{\beta}_2 \text{Log POP} + \hat{e}_i$ .....(2.1)

The statistic result of model two is displayed below in table (2).

**Table (2): Regression Analysis of the Relationship Between the Dependent Variable Log Total Expenditure on Health Care by the Government (Log THLEX) and Independent Variables: Log Life Expectancy (Log LEXP) and Log Population Log POP.**

Independent Variables	Estimated Coefficient	Standard Error	T value	Probability
Constant $\hat{\alpha}$	-35.69815	30.05088	-1.187924	0.2561
LOG(LEXP) Coefficient $\hat{\beta}_1$	-6.164461	12.66762	-0.486631	0.6346
LOG(POP) Coefficient $\hat{\beta}_2$	4.921825***	1.614170	3.049137	0.0093
R-squared= 0.965856 Adjusted R-squared= 0.960603 F-statistic= 183.8706 Prob(F-statistic)= 0.000000				

\*\*\* Significant at 1% level

Source: E view Estimate

\*\* Significant at 5% level

\*Significant at 10% level

Table (2) provides the finding for model (2) by presenting the statistical results for both the intercept ( $\hat{\alpha}$ ) and the slope ( $\hat{\beta}$ ) for the two independent variables.

In this model our dependent variable is Log total expenditure on health care by the government (Log THLEX). The table shows that coefficient for Log (POP) is equal 4.9218 and it is both significant at the

one percent level and also it is positive as expected. At the same time the coefficient of Log (LEXP) is equal to -6.1644 which are negative and not significant. A possible explanation for the negative sign is that people now live longer and have good health which means they do not use other government health money.

Also, the table (2) shows the value of R-squared which is equal to 96.5%. This means that both Log (LEXP) and Log (POP) variables were able to explain about 96.5% of the total variation in the dependent variable which is Log total expenditure on health care by the government (Log THLEX). The reported adjusted R-squared is 0.9606 which always lower than R-squared value and the F value is equal to 183.8706 which is high and it is significant at the 1% level, this means our model is also well specified and can be used to forecast the total expenditure on health care by the government.

### **Third, Model Three**

Model three was specified as  $\text{Log (THLEX)} = f(\text{Log LEXP}, \text{Log PCI}, e_i)$   
 ..... (3)

And in linear form it is  $\text{Log } \hat{\text{THLEX}} = \hat{\alpha} + \hat{\beta}_1 \text{Log LEXP} + \hat{\beta}_2 \text{Log PCI} + \hat{e}_i$   
 ..... (3.1)

The statistic results of model three is presented in table (3).

**Table (3): Regression Analysis of the Relationship Between Dependent Variable Log Total Expenditure on Health Care by the Government (Log THLEX) and two Independent Variables: Log life Expectancy Log (LEXP) and Log Per Capita Income Log (PCI).**

Independent Variables	Estimated Coefficient	Standard Error	T value	Probability
Constant $\hat{\alpha}$	-98.40334	20.14271	-4.885308	0.0003
LOG(LEXP) Coefficient $\hat{\beta}_1$	25.31086***	5.13186	4.932095	0.0003
LOG(PCI) Coefficient $\hat{\beta}_2$	0.378168	0.261277	1.447387	0.1715
R-squared= 0.949565 Adjusted R-squared= 0.941806 F-statistic= 122.3783 Prob(F-statistic)= 0.000000				

\*\*\* Significant at 1% level

Source: E view Estimate

\*\* Significant at 5% level

\*Significant at 10% level

Table (3) provides the finding for model (3) by displaying the statistical results for both the intercept ( $\hat{\alpha}$ ) and the slope ( $\hat{\beta}$ ) for the two independent variables.

Our dependent variable, as before, is the Log total expenditure on health care by the government (LogTHLEX). The table shows that the coefficient for Log (LEXP) is equal 25.3108 and it is significant at the one percent level and also it is positive as expected. At the same time the

coefficient of Log (PCI) is equal to 0.378168 which is positive but it is not significant. Table (3), also shows the value of R-squared which is equal to 94.9%. This means that both Log (LEXP) and Log (PCI) were able to explain 94.9% of the total variation in the dependent variable which is Log total expenditure on health care by the government (Log THLEX). The reported R-square is 94.95% when as the adjusted R square is 94.18%.

The F statistic generally shows if our model is well specified or not. Based on the obtained F value it is equal to 122.3783 which is high and significant at 1% level. The model is well specified and has a strong forecasting power to the change in total health expenditure by the government.

#### **Fourth, Model Four:**

The fourth model was specified as:

$$\text{Log (THEX)} = f(\Delta\text{Log(TFR)}, \text{Log(POP)}, e_i) \dots \dots \dots (4)$$

In linear form the above model can be written as:

$$\text{Log } \hat{\text{THLEX}} = \hat{\alpha} + \hat{\beta}_1 \Delta\text{Log(TFR)} + \hat{\beta}_2 \text{Log (POP)} + \hat{e}_i \dots \dots \dots (4.1)$$

The statistic results of model four is presented in table (4).

**Table (4): Regression Analysis of the Relationship Between the Dependent Variable Log Total Expenditure on Health Care by the Government (Log THLEX) and Independent Variables: Change in the Log of the Total Fertility Rate  $\Delta\text{Log}(\text{TFR})$  and Log Population  $\text{Log}(\text{POP})$ .**

Independent Variables	Estimated Coefficient	Standard Error	T value	Probability
Constant $\hat{\alpha}$	-48.07127	4.198212	-11.45041	0.0000
$\Delta\text{Log}(\text{TFR})$ Coefficient $\hat{\beta}_1$	0.355492	0.477280	0.744829	0.4707
$\text{Log}(\text{POP})$ Coefficient $\hat{\beta}_2$	4.001275***	0.276683	14.46158	0.0000
R-squared= 0.959912 Adjusted R-squared= 0.953231 F-statistic= 143.6720 Prob(F-statistic)= 0.000000				

\*\*\* Significant at 1% level

Source: E view Estimate

\*\* Significant at 5% level

\*Significant at 10% level

Table (4) explains the finding for model (4) by displaying the statistical results for both the intercept ( $\hat{\alpha}$ ) and the slope ( $\hat{\beta}_1$ ) for the two independent variables.

Our dependent variable as before is Log total expenditure on health care by the government (Log THLEX). The table shows that changes in the Log of total fertility  $\Delta\text{Log (TFR)}$  coefficient are equal to 0.3554 and it is positive but not significant. This means as more children are born, government will spend more on health care. At the same time the coefficient of Log (POP) is equal to 4.0012 which is positive as expected and it is significant at the one percent level. This means as population increases the government spending on health care will increase.

Table (4) also presents the value of R-squared which is equal to 95.9%. This means that both  $\Delta\text{Log (TFR)}$  and  $\text{Log(POP)}$  were able to explain about 95.9% of the total variation in the dependent variable which is Log total expenditure on health care by the government (Log THLEX). The reported adjusted R-squared is about 0.9532 which is always lower than R-squared ( $=0.9599$ ). The F value is equal to 143.6720 which is very high and it is significant at 1% level. This means the model is well specified and the two independent variables can explain the total variation in the dependent variable.

#### **Fifth, Model Five:**

Model five was specified to include the independent variables. More specifically, the model has the following form:

$$\text{Log (THEX)} = f (\Delta\text{Log(LEXP)}, \text{Log (POP)}, \Delta\text{Log(CBR)}, e_i) \dots \dots \dots (5)$$

And in linear form we can write the above model as follows:

$$\text{Log } \hat{\text{THLEX}} = \hat{\alpha} + \hat{\beta}_1 \Delta \text{Log(LEXP)} + \hat{\beta}_2 \text{Log (POP)} + \hat{\beta}_3 \Delta \text{Log(CBR)} + \hat{e}_i$$

.....(5.1)

The statistic results of model five is presented in table (5).

**Table (5): Regression Analysis of the Relationship Between Dependent Variable Total Expenditure on Health Care by the Government (THLEX) and Three Independent Variables:  $\Delta \text{LOG(LEXP)}$ ,  $\Delta \text{LOG(CBR)}$  and  $\text{LOG(POP)}$**

Independent Variables	Estimated Coefficient	Standard Error	T value	Probability
Constant $\hat{\alpha}$	-49.07966	3.859150	-12.71774	0.0000
$\Delta \text{LOG(LEXP)}$ Coefficient $\hat{\beta}_1$	-2.594526	9.853033	-0.263323	0.7972
$\text{LOG(POP)}$ Coefficient $\hat{\beta}_2$	4.068257***	0.254493	15.98574	0.0000
$\Delta \text{LOG(CBR)}$ Coefficient $\hat{\beta}_3$	0.246013	0.332150	0.740667	0.4744
R-squared= 0.960473 Adjusted R-squared= 0.949693 F-statistic= 89.09658 Prob(F-statistic)= 0.000000				

\*\*\* Significant at 1% level

Source: E view Estimate

\*\* Significant at 5% level

\*Significant at 10% level



Table (5): summarize the findings for model (5) by showing the estimated coefficient of each of the independent variables  $\Delta\text{Log}(\text{LEXP})$ , and  $\Delta\text{Log}(\text{CBR})$  and  $\text{Log}(\text{POP})$ , as well as the standard error, the T- value, and the Probability value of the t- test.

The  $\Delta\text{Log}(\text{LEXP})$  coefficient is about -2.5945 and it is not significant. At the same time, the coefficient of  $\text{Log}(\text{POP})$  is equal to 4.0682 which is positive as expected and it is significant at the one percent level. Finally, the coefficient of  $\Delta\text{Log}(\text{BRT})$  is equal to 0.2460, and it is positive but not significant.

Table (5) also displaying the value of R-squared which is equal to 96%. This means that  $\Delta\text{Log}(\text{LEXP})$ ,  $\Delta\text{Log}(\text{CBR})$  and  $\text{Log}(\text{POP})$  were able to explain about 96% of the total variation in the dependent variable which is  $\text{Log}$  total expenditure on health care by the government ( $\text{Log THLEX}$ ). The reported adjusted R-squared is 0.9496 and our F value is equal to 89.0965 which are high and significant at 1% level. This means our model is well specified.

### **Sixth, Model Six**

Model six was specified as the following function:

$$\text{Log (THLEX)} = f (\text{Log (POP), } \Delta\text{Log(CBR), } e_i) \dots \dots \dots (6)$$

And in linear form we can write the above function as:

$$\text{Log } \hat{\text{THLEX}} = \hat{\alpha} + \hat{\beta}_1 \text{Log (POP)} + \hat{\beta}_2 \Delta\text{Log(CBR)} + \hat{e}_i \dots \dots \dots (6.1)$$

The statistic results of model six are display in table (6).

**Table (6): Regression Analysis of the Relationship Between Dependent Variable Log Total Expenditure on Health Care by the Government (Log THLEX) and Two Independent Variables:  $\Delta\text{Log}(\text{CBR})$  and Log (POP).**

Independent Variables	Estimated Coefficient	Standard Error	T value	Probability
Constant $\hat{\alpha}$	2.367216	0.082151	28.81533	0.0000
LOG(POP) Coefficient $\hat{\beta}_1$	0.125680***	0.005418	23.19510	0.0000
$\Delta\text{LOG}(\text{CBR})$ Coefficient $\hat{\beta}_2$	-0.002486	0.007025	-0.353862	0.7296
R-squared= 0.978637 Adjusted R-squared= 0.975077 F-statistic= 274.8611 Prob(F-statistic)= 0.000000				

\*\*\* Significant at 1% level

Source: E view Estimate

\*\* Significant at 5% level

\*Significant at 10% level

Table (6) represent the finding for model (6) by providing the statistical results for both the intercept ( $\hat{\alpha}$ ) and the slope ( $\hat{\beta}_1$ ) for the two independent variables.

Our dependent variable as before is the Log total expenditure on health care by the government (Log THLEX). As shows in table (6) Log (POP) coefficient is equal to 0.1256 and it is significant at the one percent

level and it is also positive as expected. On the other hand the coefficient of  $\Delta\text{Log}(\text{CBR})$  is equal to -0.0024 which is negative but it is not significant.

Table (6) also presents the value of R-squared which is equal to 97.8%. This means that both  $\Delta\text{Log}(\text{CBR})$  and  $\text{Log}(\text{POP})$  were able to explain 97.8% of the total variation in the dependent variable which is  $\text{Log}$  total expenditure on health care by the Government ( $\text{LogTHLEX}$ ). The reported adjusted R-squared is 0.9750 which is traditionally lower than R-squared. The reported F value in table (6) is equal to 274.8611 which is very high and is significant at 1% level. This means our model is well specified.

### **Seventh, Model Seven:**

Model seven was specified as follows:

$$\text{Log}(\text{THLEX}) = f(\text{Log}(\text{TFR}), \text{Log}(\text{PCI}), \text{Log}(\text{CBR}), \text{Log}(\text{LEXP}), \text{ei}) \dots \dots \dots (7)$$

In linear form the model becomes:

$$\text{Log} \hat{\text{THLEX}} = \hat{\alpha} + \hat{\beta}_1 \text{Log}(\text{TFR}) + \hat{\beta}_2 \text{Log}(\text{PCI}) + \hat{\beta}_3 \text{Log}(\text{CBR}) + \hat{\beta}_4 \text{Log}(\text{LEXP}) \dots \dots \dots (7.1)$$

The statistic results of the above model seven is presented below in table (7):

**Table (7):Regression Analysis of the Relationship Between Dependent Variable Log Total Expenditure on Health Care by the Government (THLEX) and Independent Variables: Log (TFR), Log(PCI), Log(CBR), Log(LEXP).**

Independent Variables	Estimated Coefficient	Standard Error	T value	Probability
Constant $\hat{\alpha}$	-29.60862	22.81118	-1.297987	0.2208
LOG(TFR) Coefficient $\hat{\beta}_1$	-0.994490***	0.354690	-2.803827	0.0172
LOG(PCI) Coefficient $\hat{\beta}_2$	0.960743***	0.238954	4.020622	0.0020
LOG(CBR) Coefficient $\hat{\beta}_3$	-0.686885*	0.376894	-1.822487	0.0957
LOG(LEXP) Coefficient $\hat{\beta}_4$	9.096703	5.546928	1.639953	0.1293
R-squared= 0.978626 Adjusted R-squared= 0.970854 F-statistic= 125.9115 Prob(F-statistic)= 0.000000				

\*\*\* Significant at 1% level

Source: E view Estimate

\*\* Significant at 5% level

\*Significant at 10% level

Table (7) provides the finding of model (7) by showing the statistical results for both the intercept ( $\hat{\alpha}$ ) and the slope ( $\hat{\beta}$ ) for the independent variables.

The dependent variable for this model is Log total expenditure on health care by the government (Log THLEX). The table shows that Log (TFR) coefficient is equal to -0.9944 and it is negative and significant at the one percent level. At the same time, the coefficient of Log (PCI) is equal to 0.9607 which is positive and significant at the one percent level. Also, the Log (CBR) coefficient is equal to -0.6868 and it is significant at 10% only. Finally, Log (LEXP) coefficient is positive and is equal to 9.0967 but it is not significant at any level.

Table (7) shows the value of R-squared which is equal to 97.8%. This means that both Log (LEXP) and Log (POP) variables were able to explain 97.8% of the total variation in the dependent variable Log total expenditure on health care by the government (Log THLEX). The reported adjusted R-squared is 0.9708 which is always lower than R-squared value as in table (7). The F value is equal to 125.9115 which is very high and significant at 1% level. This means the model is well specified and the independent variables can explain the variation in the dependent variable.

### **Eight, Model Eight**

Model eight has the following functional specification:

$$\text{Log (THLEX)} = f(\text{Log(TFR)}, \text{Log(PCI)}, \text{Log(CBR)}, e_i) \dots \dots \dots (8)$$

We can write the above model in linear form as:

$$\text{Log } \hat{\text{THLEX}} = \hat{\alpha} + \hat{\beta}_1 \text{Log(TFR)} + \hat{\beta}_2 \text{Log(PCI)} + \hat{\beta}_3 \text{Log(CBR)} + \hat{e}_i \dots \dots \dots (8.1)$$

The statistic result of model eight is displayed in table (8).

**Table (8): Regression Analysis of the Relationship Between Dependent Variable Log Total Expenditure on Health Care by the Government (Log THLEX) and Independent Variables: Log (TFR), Log(PCI), Log(CBR).**

Independent Variables	Estimated Coefficient	Standard Error	T value	Probability
Constant $\hat{\alpha}$	7.731680	1.478735	5.228579	0.0002
LOG(TFR) Coefficient $\hat{\beta}_1$	-1.314508***	0.316349	-4.155243	0.0013
LOG(PCI) Coefficient $\hat{\beta}_2$	1.329365***	0.086605	15.34973	0.0000
LOG(CBR) Coefficient $\hat{\beta}_3$	-0.905318**	0.376576	-2.404081	0.0333
R-squared= 0.973400 Adjusted R-squared= 0.966750 F-statistic= 146.3774 Prob(F-statistic)= 0.000000				

\*\*\* Significant at 1% level

Source: E view Estimate

\*\* Significant at 5% level

\*Significant at 10% level

Table (8) present the findings for model (8) by displaying the statistical results for both the intercept ( $\hat{\alpha}$ ) and the slope ( $\hat{\beta}$ ) for the independent variables.

Our dependent variable, as before, is Log total expenditure on health care by the government (Log THLEX). The table shows that the coefficient of Log (TFR) is equal to -1.3145 and it is significant at the one percent level. At the same time, the coefficient of Log (PCI) is equal to 1.3293 which is positive and also significant at the one percent level. The Log (CBR) coefficient is equal to -0.9053; this means it is significant at the 5% level.

Table (8) shows the value of R-squared which is equal to 97.3%. This means that both LOG (TFR), LOG (POP), and Log (CBR) were able to explain 97.3% of the total variation in the dependent variable which is Log total expenditure on health care by the government (Log THLEX). The reported adjusted R-squared is equal to 0.9667 which is traditionally lower than R-squared value. Based on the F value, it is equal to 146.3774 which are high and it is significant at 1% level as shown in the table (8).

## **Chapter Six**

# **Summary and Recommendations**



## **Chapter Six**

### **Summary and Recommendations**

This chapter presents a summary and recommendations which can be obtained from the empirical results taking into consideration the effect of public health expenditure in reducing the risk in the public health care system in Palestine. This research was done with the objective of examining the factors that may impact total health expenditure in Palestine for the period of 1995-2016. By identifying these factors government can follow policies aiming at reducing the risk in the public health care system in Palestine.

The study included a descriptive section of the current status of the health care system in Palestine. Throughout the study, the health system in Palestine has been found to be still under developed and at the same time facing many challenges as follow (World Health Organization, 2006):

- The So-called Israeli occupation.
- Increasing population growth.
- Lack of sources for funding this sector.
- Lack of economic opportunities.
- Shortages of adequate financial resources.
- Shortages of basic supply of medicine.

The empirical results provide evidence that health care spending is associated with improvements in the health outcomes or indicators as well as per capita income and population. The study utilized the regression analysis which is a statistical modeling technique used for examining and estimating relationship among variables. As a result we utilized this technique for estimating the impact of a set of independent variables on the dependent variable. After a careful examination to the statistical results reported for model one through model eight it was clear that health care system in Palestine is affected positively and negatively by several independent variables. In all models it has been demonstrated that population has a positive relationship with health expenditure and is statistically significant variable. This means the marginal impact of the population size ranges from a value of 0.12 in model six to 4.92 in model two. Thus a one percent increase in population may lead to 0.12 to 4.92 percents increase in total health care spending.

Another important variable is the per capita income. The result shows that at least in four of the eight models per capita income has a positive sign and is significant. In light of this result of the research, the total expenditure on health care by the government is linked with per capita income and population. So whenever there is an increase in population and the per capita income, this will lead to more government spending on the health sector and thus reduce the risks in the public health sector in Palestine.

The statistical results reveal that life expectancy variable has mixed results. This means the coefficient of this variable has one time a positive sign in some models and has a negative sign in some other models. The coefficient of the total fertility variable has also mixed results where sometimes it has been found to be negative but has a significant relationship with the total health expenditure in Palestine. Finally the crude birth rate variable has a negative sign in three models out of the eight and only one time it has a positive. However the coefficient of this variable is not significant.

The above findings show that per capita income and population has a dominant effect on health care expenditure than life expectancy, total fertility, and birth rate variables. This confirms that to have a healthy status and to have a good well-being government need to pay more attention to income level and to the structure of the population in order to have healthy society.

## **Recommendations**

The study finding led to some key recommendations. The most important of these recommendations are:

-It is recommended that the government follow a clear risk management strategy to improve the current status of the health sector in Palestine. This will make the country ready in the case of emergency.

- It is recommended that the country follow a population policy to keep up with the changes in the population structure and population size .

- It is recommended that the country follow an economic policy aimed at increasing per capita income. This will increase the expenditure on the health sector by both the private and the public sector.

- It is recommended that an appropriate management method is implemented to plan, guide, forecast, analyze and measure risk which may affect the health sector and to determine the best means to manage the health sector.

- It is recommended to continuously improve the status of the health sector in the country by allocating more funding to hospitals and other health care facilities. This may require the appointment of a risk manager at hospitals to assess the level of risk and find means to reduce it.

- It is recommended that government spending focus on providing new services and improving existing services and at the same time pay attention to the primary care and health education in order to reduce the incidence of complications.

- It is recommended that the Ministry of Health strategic plan focus more on planning, organizing, directing and controlling, and analyzing and measuring risk and losses in health sector.

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# Appendixes

### Appendix (1)

**Table (9): Palestine Data (2000- 2015)**

Years	THLEX	Pop	GDP	LEXP	TFR	BRT
2000	108,007.4	3,053,335	4313.6	69.6	5.9	40.7
2001	113,952.8	3,138,471	4003.7	69.8	5.1	40.1
2002	124,948.6	3,225,214	3555.8	70.1	4.9	39.9
2003	153,122.2	3,314,509	3968	70.4	4.7	30.22
2004	212,023.7	3,407,417	4329.2	70.7	4.5	30.22
2005	213,931.5	3,508,126	4831.8	71	4.4	37.3
2006	221,104.6	3,611,998	4910.1	71.5	4.2	32.5
2007	242,670.3	3,719,189	5505.8	71.5	4	32.6
2008	328,702.7	3,825,512	6673.5	71.2	3.9	32.7
2009	346,039.1	3,935,249	7268.2	72	3.7	32.7
2010	390,226.1	4,048,403	8913.1	72.3	4.4	32.8
2011	423,998.7	4,168,860	10465.4	72.5	4.51	32.8
2012	488,683.0	4,293,313	11279.4	72.7	4.51	32.7
2013	584,061.3	4,420,549	12476.0	72.9	4.51	32.6
2014	513,337.0	4,550,368	12715.6	73.3	4.1	32.3
2015	542,568.4	4,682,467	12673	73.5	4.48	31.9



جامعة النجاح الوطنية

كلية الدراسات العليا

## تأثير نفقات الصحة العامة في الحد من المخاطر في نظام الرعاية الصحية العامة في فلسطين

إعداد

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إشراف

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د. محمد مرعي

قدمت هذه الأطروحة استكمالاً لمتطلبات الحصول على درجة الماجستير في إدارة الكوارث بكلية الدراسات العليا في جامعة النجاح الوطنية في نابلس، فلسطين.

2019

ب

تأثير نفقات الصحة العامة في الحد من المخاطر في نظام الرعاية الصحية العامة في فلسطين

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الملخص

الصحة الوطنية مهمة للغاية لرفاهية أي بلد. إن أي إهمال لهذا القطاع سيزيد من المخاطر الوطنية ويتسبب في مضاعفة المشكلات الصحية. إن الإنفاق على الصحة العامة مهم للغاية لبقاء أي مجتمع. تهدف هذه الدراسة إلى فهم حجم الإنفاق الحكومي الكلي على القطاع الصحي في فلسطين ، وهو عنصر أساسي في الأمن الصحي الوطني ، كما تهدف إلى تحديد الروابط بين العوامل الاقتصادية والاجتماعية و الصحية التي قد تؤثر على حجم الإنفاق الصحي. وقد ثبت أن عوامل مثل دخل الفرد الذي يعد مقياس للتنمية الاقتصادية ؛ والمتغيرات الصحية الأخرى مثل متوسط العمر المتوقع عند الميلاد، والمتغيرات الاجتماعية مثل معدل الخصوبة الكلي ومعدل الولادة، لها تأثير على الإنفاق الصحي.

استخدمت هذه الدراسة تحليل الانحدار كأداة إحصائية لدراسة تأثير العوامل الصحية والاقتصادية والاجتماعية على إجمالي الإنفاق الصحي من قبل الحكومة في فلسطين.

لتحقيق هدف الدراسة ، قمنا بتحديد متغيرًا تابعًا يسمى إجمالي الإنفاق على الرعاية الصحية من قبل الحكومة والعديد من المتغيرات الصحية والاقتصادية والاجتماعية المستقلة التي تقيس النتائج الصحية. ومن بين هذه المتغيرات المستقلة دخل الفرد ومتوسط العمر المتوقع ومعدل الخصوبة الكلي ومعدل المواليد الخام وعدد السكان.

وبناءً على نتائج البحث، وجدت الدراسة وجود علاقة إيجابية وهامة بين المتغير التابع وهو إجمالي الإنفاق على الرعاية الصحية من قبل الحكومة والمتغيرات الصحية والاجتماعية والاقتصادية الرئيسية المستقلة مثل عدد السكان ، ونصيب الفرد من الدخل، ومتوسط العمر المتوقع عند الميلاد ومعدل الخصوبة الكلي ومعدل المواليد الخام.

كشفت نتائج الدراسة عن الحاجة إلى ضرورة وجود استراتيجية واضحة لإدارة المخاطر تهدف إلى تحديد العوامل الأساسية التي تؤثر على إجمالي الإنفاق الصحي في فلسطين. وهذا من شأنه زيادة الوعي وتركيز الاهتمام على قطاع الصحة كعنصر أساسي للأمن القومي والتقدم.

ستساعد نتائج هذه الدراسة صناع السياسة في بناء سياسات وطنية تهدف إلى حماية القطاع الصحي والحفاظ عليه من أي مخاطر غير متوقعة مثل تدهور الخدمات الصحية وانتشار الأمراض.

