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Evaluating the governmental health expenditure pattern and its association with health outcomes in Egyptian governorates

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Evaluating the Governmental Health Expenditure Pattern and Its Association with Health Outcomes in Egyptian Governorates

A Thesis Submitted to:

Sustainable Development Program

In partial fulfilment of the requirements for

The degree of Master of Science in Sustainable Development

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ABSTRACT

Health is one of the basic human rights; not all citizens are able to access quality healthcare services; therefore, countries allocate a considerable fund to healthcare provision but there is no general agreement about the effectiveness of monetary health inputs against health outcomes. The thesis evaluates the current governmental health expenditure pattern in Egyptian governorates and its relation to selected health outcomes. The study conducts secondary analysis for grouped data from different sources for year 2013-2014, applying descriptive, correlation and regression analysis by SPSS tool. It was found that there are disparities between governorates and regions in socioeconomic, health conditions, health expenditure and health outcomes. Upper Egypt region suffers more than other regions, there is an association between government health expenditure and health outcomes but the current expenditure pattern does not improve the health outcome. Health financing system in Egypt is suffering from inefficiencies and inequalities. The thesis concludes that public resources reallocation is a key solution to solve health inequity problem. It is recommended that a resource allocation formula should be adopted by MoHP to

ensure equitable allocation of resources between governorates. Poverty is the main factor affects health outcomes and several living conditions, thus there should be tailored healthcare programs targeting the poor.

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List of Acronyms

CHE	Current Health Expenditure
FHF	Family Health Fund
FY	Fiscal Year
GDP	Gross Domestic Product
GGHE	General Governmental Health Expenditure
HIO	Health Insurance Organization
HSRP	Health Sector Reform Program
IMF	International Monetary Fund
IMR	Infant Mortality Rate
LE	Egyptian Pound
LMIC	Lower Middle Income Countries
MDG	Millennium Development Goals
MHE	Ministry Of Higher Education
MMR	Maternal Mortality Rate
MOH	Ministry Of Health
NCDs	Non-Communicable Diseases
NGO	Non-Governmental Organization
OOP	Out Of Pocket
PTES	Program For Treatment On The Expense Of The State
RMNCH	Reproductive, Maternal, Newborn And Child Health
SDS	Sustainable Development Strategy
SHI	Social Health Insurance
THE	Total Health Expenditure
U5MR	Under 5 Mortality Rate
UN	United Nations
UNDP	United Nations Development Program
UNICEF	United Nations International Children's Emergency Fund
USD	United States Dollar
WB	World Bank
WHO	World Health Organization

Chapter1.Introduction

Health is one of the basic human rights; it is considered an essential contributor to the economic growth and social prosperity. Additionally, it is a good indicator for nations' progress in achieving sustainable development. Since, health is a pre-condition and an outcome of sustainable development and is related to the three main pillars of sustainable development (economic, social, and environmental). Accordingly, health for all cannot be achieved without enabling policies, procedures and inter-sectoral actions because several critical determinants of health and illness lie outside the health sector (WHO, 2015-S.Shawky, 2001).

Regrettably, not all citizens are able to access and utilize quality healthcare services, as it depends on their ability to pay. Health systems face a challenge to deliver quality healthcare to all citizens in an environment of rapid epidemiological transition, political and economic instability, and financial pressure (Jacobs & El-Sadr, 2011).

Inequality was one of the factors that led to the social and political turmoil in Egypt in January 2011. Nevertheless, the absence of social justice and uneven distribution of resources across different aspects of life have been deeply rooted in the Egyptian society over the last decades. Recent estimates by the World Bank suggest that income gap has increased over the past 10 years while population living below the poverty line has steadily risen to reach 26% in 2011, most of which are either residing in Upper Egypt or in rural areas (world bank,2015- Helmy,2011).

Healthcare system has no exception to this trend. Improvements in health status as well as financial protection have not been occurred equally across the population. For example, despite the fact that Egypt is on the track to achieve MDG 4 of child mortality, "a child born in

rural Upper Egypt is only half as likely to survive till the age of five as a child born in urban Lower Egypt" (DHS,2015) .

At the same time, protection against health expenditures is either unavailable or insufficient. Unfortunately, almost 7 % of the population is pushed into poverty every year due to catastrophic health expenditures (ElGazzar H et al,2011). Moreover, Out-Of-Pocket payments (OOPs) comprise 72 % of the total health expenditures in Egypt (NHA,2009), posing a greater burden on the poor and most vulnerable people.

Most of the countries allocate a considerable fund to provide healthcare services believing this would improve the health status of citizens , thus relationship between health expenditures and health outcomes continues to catch the attention of many researchers and policy maker. Despite the decades of intensive study, there is no general agreement about the effectiveness of monetary health inputs for health outcomes (Anyanwu & Erhijakpor, 2007).

On the other hand, while the rising cost of the healthcare has been a serious issue for discussion, relatively little attention has been placed on the relationship between spending on health and health outcomes such as Infant Mortality Rate ,Maternal Mortality Rate in different countries. Thus, many studies were carried out to examine the impact of public health expenditures on the national health outcomes (Yaqub, J.O et al, 2012).

Many studies do not indicate whether increasing health spending is a positive, negative, or non-significant factor because in some LMIC, the increased healthcare spending ineffective because infrastructure needed to access healthcare may not exist, (Kim& R. Lane, 2013). Therefore, there is a need to evaluate the effectiveness of increasing health expenditures and answering questions such as: Did past expenditures on health affect the health outcomes? Are

increases in expenditures needed to improve the health outcomes? (Anyanwu & Erhijakpor, 2007). These questions can only be answered by studying the relationship between health outcomes and health expenditures.

This study is motivated by the inclusive debate on the relationship between governmental health expenditures and health outcomes. Due to that, the main purpose of this paper is evaluating the current governmental health expenditure pattern in Egyptian governorates and its relation with selected health outcomes (e.g. Under-five mortality, Infant mortality).

The aim of this study is to shed light on the pattern of public health spending in the Egyptian context and its relation with health outcomes in different governorates. Moreover, the study will help in drawing policy guidance to better allocation of resources and directing health spending to tailored interventions improve health outcomes and achieve health equity in governorates.

Research question:

"To what extent does the current public health expenditure pattern in Egyptian governorates achieve health equity and decrease health disparities?"

Objectives:

In order to be able to answer the research questions, the study tackled the following research objectives:

1. Understanding the demographic and Socio-economic characteristics of Egyptian governorates.
2. Understanding the health system in Egypt through healthcare system inputs, health needs and health outcomes.

3. Describe the health expenditure pattern in the Egyptian governorates
4. Examining the association between government health expenditure and selected health outcomes in addition to correlation between different factors affect health outcomes.

Study Limitation:

The results of the thesis are dependent on the accuracy of the data sets and indicators used in the thesis, which are quoted from governmental sources. Some of these data sets may require in-depth review of how data is collected and/or how indicators are calculated. For example, the registration of Infant Mortality Rate IMR is inaccurate in rural areas, due to cultural and practical reasons, thus IMR is higher in Cairo than other governorates because Cairo has the best registration rate for infant death cases.

Another example of the need for data review is the available governmental health expenditure data includes the revenue for the governorates from different resources, thus the number of governmental health expenditure may not represent the right budget allocated directly from the government.

Therefore, it is a limitation of the thesis that within the thesis timeframe and scope, it is not practically feasible to review all data sets and indicators quoted from secondary sources.

In depth analysis is required to indicate the actual impact of factors affect health outcomes, due to that this study is considered an explanatory analysis for the association between different factors such as government health expenditure, poverty rate, GDP per capita and health outcome.

Chapter 2.Literature review

2.1 : Egypt's profile

2.1.1 Country context

Egypt is located on the north of Africa. It is surrounded from the north by the Mediterranean Sea from the west by Libya, from the east by the Red sea, and from the south by Sudan. The whole area of Egypt is about one million square kilometers. However, much of Egypt is desert, only 7.7 percentage of its area is inhabited (DHS, 2014).

Administratively, Egypt is divided into seven regions, including twenty seven governorates, four of them are classified as urban governorates (Cairo, Alexandria, Suez, and Port Said) while the other twenty three governorates are containing urban and rural areas, Moreover, nearly 98 percentages of Egyptians live on the 6 percentage of its area along the Nile Valley and Delta (CAPMAS, 2015).

The detailed list of regions governorates and urbanization percentage is indicated in the table (1).Nearly forty percentages of Egyptian population live in urban areas; and the distribution of them by the urban-rural residence has remained unchanged since the mid-1990s (DHS, 2014).

MAP OF EGYPT

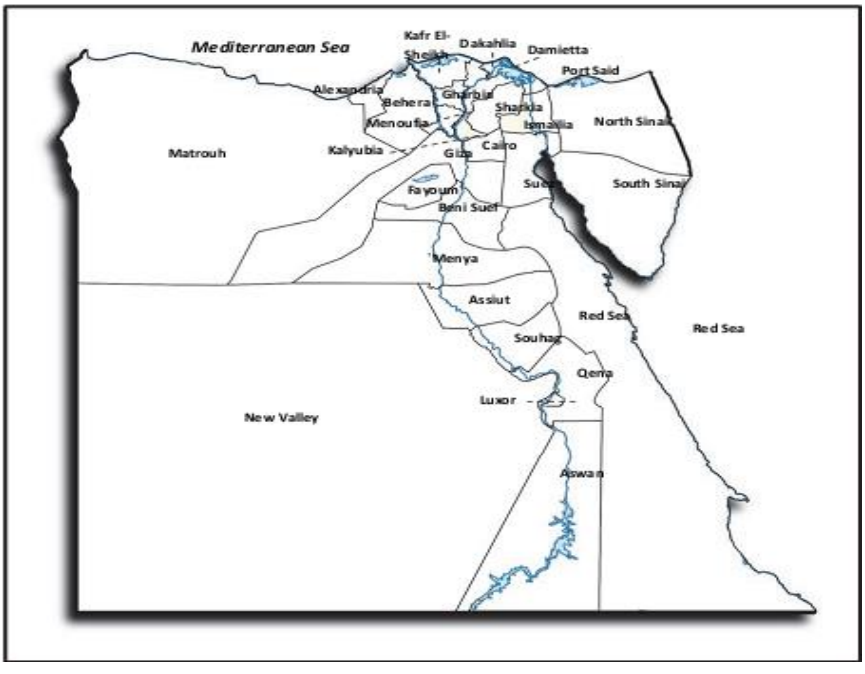


Figure (1): The Map of Egypt.
Source: DHS, 2014.

Table 1: list of Egypt governorates distributed according to the regions and urbanization %

Region	Governorate	urbanization %
Greater Cairo	Cairo	100
	Giza	58.6
	Qalioubeya	44.7
Alexandria	Alexandria	98.8
	Behira	19.5
	Matrouh	70.6
Delta Region	Sharqeya	23.1
	Domiat	38.7
	Menoufeya	20.6
	Gharbeya	30
	Kafr el-Shiekh	23.1
	Daqahleya	28.2
Suez Canal and Sinai	Port Saied	100
	Suez	100
	Ismailia	45.4
	North Sinai	60.2
	South Sinai	51.1
Northern Upper Egypt	Menia	18.9
	BeniSuef	23.2
	Fayoum	22.5
Asiout Region	Asiout	26.5
	New Valley	48
South Upper Egypt	Sohag	21.4
	Qena	19.7
	Aswan	42.3
	Luxor	37.8
	Red Sea	95.1

Source**:** CAPMAS, 2014

Population

Egypt's population is growing with an accelerating pace; in the 1st of January 2016 the population was estimated at 90.5 million, while for the 1st of January 2014 the population was estimated at 86.8 million; roughly 2.2 million of them living abroad (CAPMAS, 2016). Egypt is ranked the 15th most populous country worldwide and the 1st among all Arab countries. Cairo and Giza are considered the most crowded cities having an average of over 1,540 persons per km² (WHO, 2010). In 2010, there are approximately 16 million people who live in Egypt's 1105 slum areas which represent approximately 30 percent of residential areas, where the availability of utilities, health and social services is severely limited (WHO, 2010).

World Bank Classification

According to the World Bank classification , Egypt is one of the lower-middle income countries LMIC, ranked 108 out of 187 countries on the UNDP human development index *dropping from 101 in 2010 and the Gini inequality coefficient** is 30.77 (UNDP, 2016). Gross domestic product (GDP) as in 2014 is USD 286.5billion. GDP per capita rose from 1,196.7 USD in 2005 to 3,198.7 USD in 2014, while the inflation rate is 10.1 % (World Bank, 2015). The numbers prove that this growing trend was not accompanied by real improvement of social conditions. The latest Demographic and Health Survey shows that total fertility rate has risen from 3.0 in 2008 to 3.5 in 2014(for women between 15 and 49 years) (DHS, 2014).

*Human development index (HDI): A composite index measuring average achievement in three basic dimensions of human development—a long and healthy life, knowledge and a decent standard of living (UNDP,2016).

** Gini index measures the extent to which the distribution of income or consumption expenditure among individuals or households within an economy deviates from a perfectly equal distribution. A Gini index of 0 represents perfect equality, while an index of 100 implies perfect inequality (WB, 2015)

Economic Condition

Egypt GDP represents 0.37 % of the world economy, due to the political uncertainty, the economic growth was adversely affected. Real GDP growth reduced to 2.2 % from December 2012/13 and it became 3.8 in 2014/2015 (Trading and economics website, 2016). Despite the continuous increase in GDP/ capita which reached 22028.3, as shown in Figure (2), (MOP, 2015) , inflation adjusted real GDP growth reduced to under 2%, which more or less matched the population growth resulting in stagnation or a minor negative real growth in GDP/capita (IMF, 2015).

As the government has continued to stimulate growth without resorting to wide budget cuts, the budget deficit has risen sharply, reaching 13% of GDP in FY 2013/2014. then the budget deficit has evolved positively, diminishing to 11% for July 2014 to May 2015 (Ministry of Finance, 2015), Egypt will still face the challenge of accommodating its objective of macro-economic stability with the objective of increasing public investment on health and other social sectors

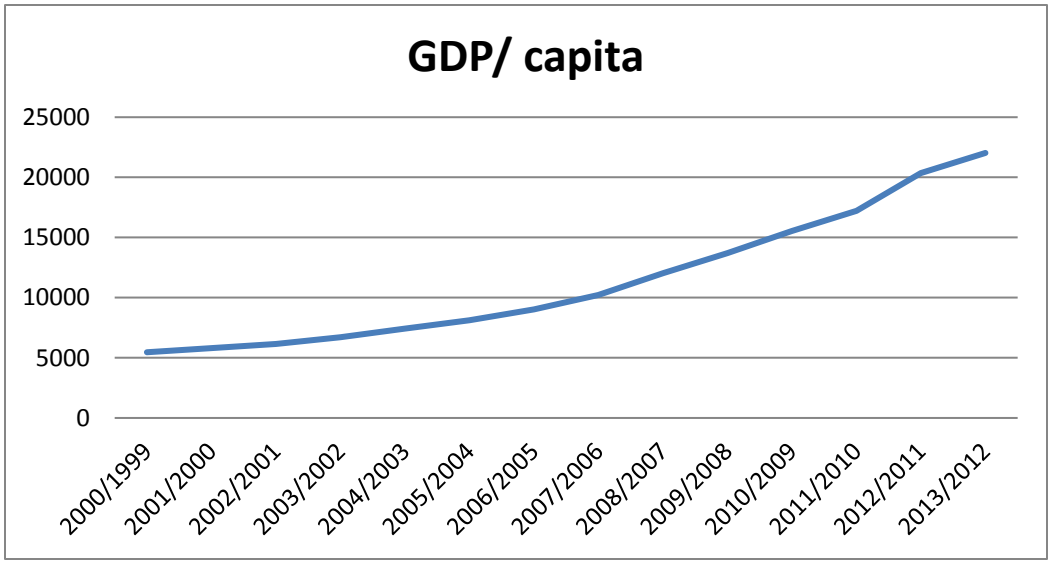


Figure (2): GDP/ Capita from 1999/2000 to 2012/2013 source: Ministry of Planning, 2014.

Poverty

Despite economic growth is the relatively improved, the proportion of the population living below the poverty line has steadily risen since the year 1995/1996 (16.7 %) to reach 25.2 in 2011 as shown in figure (3), and the rate becomes 26.3 % in 2014, particularly among rural inhabitants and urban areas in Upper Egypt governorates (Helmy HE, 2011) and around 40% of Egyptians living under the international poverty line of 1.25 USD a day (UNDP, 2014).

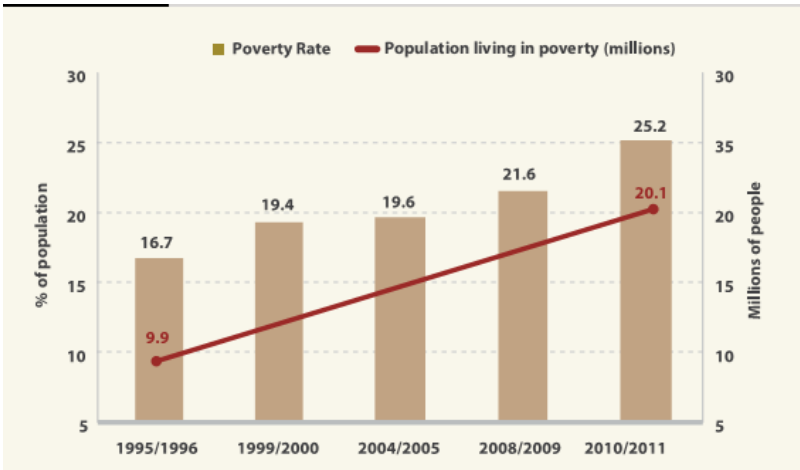


Figure (3): National poverty rates, 1995/6-2010/11 source: World Food Program, 2013

Furthermore, a recent UNICEF/CAPMAS study has shown that 29% of children in Egypt and 53% of children in rural Upper Egypt are living in poverty (UNICEF and CAPMAS, 2015).Thus, quarter the Egyptian citizens are suffering from poverty according to CAPMAS survey conducted on income and expenditure survey in Egypt and consider poor who spend in the less than LE 3,076 (USD 500) in a year, CAPMAS has associated poverty with various factors such as geographical areas urbanization, family size, working conditions, and literacy.

Around 50% of rural areas in Upper Egypt are considered poor against 10% in urban areas. Therefore, there is a large disparities and inequitable growth; a shrinking public sector; inefficient safety net programs unable to target the poor; and the digital Divide, making the poor more affected by economic shocks (UNDP, 2016).

Socioeconomic Indicators

The demographic indicators for Egypt illustrated that more than 50 % of Egypt is rural areas and have access to improved water sources and sanitation. Third of population is under 15 years which affects the population age structure Table 2 and Table 3.

Table2: Egypt Demographic Indicators

Area Km^2		1009500
Population 2012	Total	82541000
	Urban %	43
Population dynamic	Crude birth rate % for year 2012	31.9
	Crude death rate % for year 2012	6.9
	Growth rate % for year 2012	2.1
Age distribution ratio	<15 years %	31.5
	65+ years %	3.7
Total fertility rate (R) per woman for year 2012		3

Source: WHO, Demographic, Social and Health Indicators, 2013.

Table 3: Egypt Socioeconomic Indicators

Adult literacy rate 15+ years for year 2011%	T	70
	M	78
	F	65
Population with sustainable access to improved water source %	2012	97
Population with access to improved sanitation%		93
Unemployed%		12

Source: WHO , Demographic, Social and Health Indicators ,2013.

2.2: Egypt health system

2.2.1 Health Status

Egypt has achieved many positive steps toward improving the health status of its population over the last decades. For example, Egyptian population has become healthier over the past 20 years and the overall life expectancy has increased from 64.5 years to 70.4 years, (WHO statistics, 2013;WB, 2015).

On the national level, Egypt has made significant progress in Reproductive, Maternal, Newborn And Child Health (RMNCH). It has achieved MDG 4 with a decline of almost 75 percent in under- five mortality between 1990 and 2012. U5MR was changed from 85 per 1000 Live births in 1990 to 21 per1000 live births in 2013 as shown in Table 4, (WHO statistics, 2013). Maternal Mortality rate (MMR) in Egypt has been reduced from 120 in 1990 to 45 in 2013 (WHO statistics, 2015). Regarding child health, 92 percent of children are immunized against main preventable diseases (DHS, 2014). Moreover,80 percent of women received regular antenatal care (DHS, 2014).

Unfortunately, the benefits of the progress in health status have not accrued equally and these dramatic improvements in RMNCH have not been evenly distributed across different geographical regions and different socioeconomic classes. There are disparities in health outcomes will be highlighted in the next sections.

Table 4: Health Status Indicators

Life expectancy at birth (years) for year 2012	T	70.4
	M	71.7
	F	69
Newborns with low birth weight %	2009	6
Children under weight%	2008	6
Mortality rate per 1000 live births UN-IGME 2012 estimates	Neonatal	11.8
	Infant	17.9
	Under -5	21

Source: WHO, Demographic, Social and Health Indicators, 2013

Egypt Health System

Global health systems are going through rapid change and facing new challenges of raising cost of healthcare delivery. Therefore, health systems should provide the needed services with acceptable quality. Several factors affect the ability of health systems to deliver services such as governance in health, financing of healthcare, the access and quality of health services, human resource deficiency (EMRO, 2006).

Before moving to describe the Egyptian health system, we should take into consideration that "health system", it does not only include the Ministry of Health and Population, health system as defined by WHO also includes all public health entities and private for profit and non-profit health services providers, the pharmaceutical sector, private health insurances, , physical and mental rehabilitation centers .It also includes organizations and entities outside health sector, whose primary objective is to improve health status (WHO, 2011).

Since 1980s, Egypt has been going through a demographic and epidemiological transition that is affecting the health status of the population; the epidemiological transition is characterized by: Improvement in infants and children's mortality rates, the incidence of risk factors responsible for chronic diseases getting higher such as smoking and hypertension and obesity,

socioeconomic and environment conditions changed, leading to different diets, and increased traffic accidents.

The distribution of the burden of diseases has changed from infectious and communicable diseases to non-communicable diseases such as cardiovascular diseases and cancer that are currently the leading cause of death. Therefore, Egypt is affected by a dual burden of diseases, (EMRO, 2006).

The Egyptian healthcare system has a pluralistic nature, consists of a wide range of public and private healthcare provider, financing agent and financing sources (EMRO, 2006). An important characteristic of health financing in Egypt is that the flow of funds from sources to financing schemes, purchasing agents and then on to providers occurs without clear vision about the right pathways. This makes it difficult to effectively coordinate and manage across ministries, sectors (public and private), and entities at all levels of the health system (NHA, 2011/12).

Financing Sources

The main financing sources for Egyptian health care system as shown in figure (4) are Out-Of-Pocket OOP spending by households as direct spending on health represent almost 72 percent of the total health expenditure (THE) , public entities which represent around 26 percent of THE government spending that comes from direct tax revenues, while private agents, including private insurance, syndicate, firms and NGOs and employers' health spending on their employees represent 2 percent and donors assistance .Funds of health financing are used by different entities including the Ministry of Health (MOH), Health Insurance Organization (HIO), as well as other ministries and Non-Governmental Organizations (NGOs) (EMRO, 2006;NHA,2008/09).

Further breakdown of the public financing entities includes:

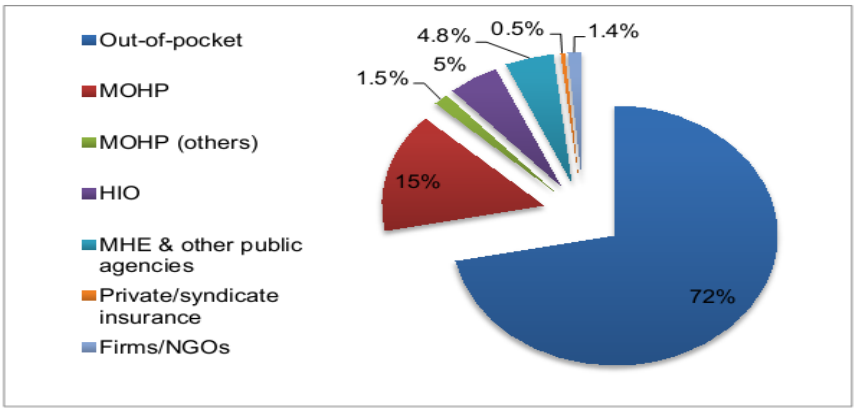
a) Health Insurance Organization (HIO) which covers 58 percent of the population (48.7 million persons) Of those covered, 74 percent are under-five and school children, while widows and pensioners represents 6 percent, (the rest are formal employees) (HIO,2011) .

b) Ministry of health and population (MOHP), the primary government entity responsible for providing the preventive health services in Egypt, curative services free or subsidized services for uninsured citizens.

c) Program for treatment at the expense of the state (PTES): originally intended to cover financial protection for the uninsured.

d) Family health funds (FHFs): developed initially to provide primary basic package, however faced challenges to expand due to voluntary schemes (WB,2015).

Figure (4): Sources of Health Financing In Egypt



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Source: NHA,2008/09

Health Purchaser

Health purchaser is defined as the contracting and purchasing agencies which purchase healthcare service on behalf of the beneficiaries. The main health purchaser in Egypt is Health Insurance Organization (HIO). It is the only public insurance organization that provides coverage for certain benefit package of healthcare services to approximately 60% of population. In addition to the private insurance sector which includes private companies and syndicates (such as medical syndicate). This sector provides a similar service to their beneficiaries (HIO, 2015).

is the program for Treatment on the Expense of the State (PTES) is an main purchaser for health services in Egypt , PTES is a special purchaser/ fund program to pay for selected healthcare services within the country and abroad for people who cannot have enough money to get such services and do not have health insurance. PTES program has started in 1970, nearly 1.5 million of Egyptian population benefited from this program in 2012/2013. The spending for the program extended 2.8 bl EGP at this year for providing highly advanced medical services and treating chronic diseases such as renal failure, Hepatitis C virus, orthopedic surgeries, cardiovascular diseases, (MoHP report, 2014).

In 2001, Family Health Fund (FHF) was established and proposed to be the main health service purchaser in Egypt , FHF is considered to act as the central contracting and purchasing entity for the basic healthcare services with acceptable quality according to Health Sector Reform Program* (HSRP) In 1997, (NHA 2008/ 2009).

*HSRP: In 1997, Egypt initiated health Sector Reform Program (HSRP). Its objectives are to develop a sound and integrated healthcare system that can operate a market-oriented services. The main goals are to increase coverage and accessibility to higher-quality healthcare at the primary and secondary levels to reach universal coverage, separate the purchasing and providing roles to apply and decentralization and autonomy at governorate and district levels and to rationalize public health expenditure (WHO 2006; MOHP 2003)

Professional syndicate is also the founder and administrator of what is perceived as a health insurance model in Egypt with measures to control utilization and drug fraud. It also has a number of built-in measures for financial viability such as co-payments and moderate coverage ceiling. This health insurance model is replicated, with some differences by a number of professional syndicates such as the Medical Syndicate which is including union of the four medical syndicates (physicians, dentists, pharmacists, and veterinarians), engineers syndicate, and trade syndicate (EMRO, 2006)

Service providers

MoHP is the biggest service provider in Egypt; it provides health services through its network of hospitals and primary care units. In 2014, there were 657 general and specialized MoHP hospitals include 98291 beds and 5263 primary care facilities. Some of the MoHP facilities operate under specific semi-autonomous arrangements; these include the General Organization for Teaching Hospitals and Institutes (GOTHI) (19 hospitals), Curative Care Organization (CCO) (11 hospitals) and Centers of Excellency (42 hospitals) which are all operating mainly urban secondary and tertiary level hospitals(NHA.2011;MoHP,2014).

Egypt also has a wide, although mostly urban, network of university hospitals which are affiliated with universities The University Hospitals network (77 hospitals) fulfills the function of teaching and research institutions but also offer secondary and tertiary level health services and even outpatient care. The university hospitals operate largely with parallel mechanism to MoHP, notably in areas such as health information systems.

Other ministries, including the Ministry of Interior, Ministry of Transport, and Ministry of Defense, also operate health facilities (24 hospitals) and have their own mechanisms for supporting their health service operations (NHA, 2011/2012)

The private sector provide a significant part of health services , this sector includes a wide range of service providers and pharmacies, some of which operate for-profit some as non-profit or some with a mix of both (there are many examples of private health facilities where richer individuals would pay more and poorer ones would pay less or nothing). There is a huge existence to outpatient services in Egypt but the actual size of the private sector is difficult to evaluate, mainly because of dual practice. For inpatient services the situation is slightly clearer with CAPMAS reporting that 25% of hospital beds are in the private sector, but as the private sector mainly operates in smaller units, actually 68% of health units with beds are belonging to the private sector. The private sector is mostly funded through out-of-pocket payments although some have also contracts with corporations, private insurance companies, HIO or even with some ministries (NHA, 2011/12).

Therefore, in the supply side, the market for provision is as well fragmented. On the one hand, Ministry of Health owns and manages a large network of hospitals and health centers, which is considered the only choice available to low-income groups who constitute the majority of Egypt's population. Other parastatal entities including HIO and the universities and teaching hospitals have their own set of rules and run their own facilities. On the other hand, ,there is a growing private market of hospitals, clinics and private pharmacies.. In other words, the government of Egypt doesn't view the private sector as a true partner in increasing access to health services; which makes further coordination between stakeholders very difficult (NHA, 2008)

2.2.2: Health and Egyptian Constitution 2014

It is quite obvious that the real situation of Healthcare in Egypt does not reflect what is mandated by its constitution. While the 'Right to Health' is clearly articulated in Article 18 of the Egyptian constitution shown in box 1 (Egypt constitution, 2014), as all citizens are entitled to comprehensive healthcare with quality criteria, patients overwhelmingly prefer private facilities, resulting in high OOP expenditure. It is widely perceived that the services offered by public facilities are of poor quality (WB,2010). In addition, public facilities are suffering from frequent shortages of medications, a few available specialists who tend to follow protocols if they are present (WB, 2010).

Box 1: The "Right to Health" as captured in Egypt's Constitution of January 2014

The commitment to achieving social justice in healthcare is coined in Egypt's new Constitution of January 2014. Article 18 enshrines the "Right to Health" and ensures that "every citizen is entitled to health and to comprehensive healthcare with quality criteria. The state guarantees to maintain and support public health facilities that provide health services to the people, and work on enhancing their efficiency and their fair geographical distribution." To ensure this commitment is translated into action, the state has committed to allocating a percentage of government expenditure of no less than 3 percent of Gross Domestic Product (GDP) to health, almost double its current allocation. The percentage is expected to increase gradually to reach global rates with improvements in the economy and better targeting of subsidies to the poor.

Right to Health in the Egyptian Constitution: Article 18

- "Every citizen is entitled to health and to comprehensive healthcare with quality criteria. The state guarantees to maintain and support public health facilities that provide health services to the people, and work on enhancing their efficiency and their fair geographical distribution.
- The state commits to allocate a percentage of government expenditure that is no less than three percent of GDP to health. The percentage will gradually increase to reach global rates.
- The state commits to the establishment of a comprehensive healthcare system for all Egyptians covering all diseases. The contribution of citizens to its subscriptions or their exemption there from is based on their income rates. Denying any form of medical treatment to any human in emergency or life-threatening situations is a crime.
- The state commits to improving the conditions of physicians, nursing staff, and health sector workers, and achieving equity for them.
- All health facilities and health related products, materials, and health-related means of advertisement are subject to state oversight. The state encourages the participation of the private and public sectors in providing healthcare.

Source: Arab Republic of Egypt. 2014 Constitution

2.2.3: Health & the Governmental Budget

The Egyptian government has prioritized many objectives for achieving social justice in healthcare provision. In addition, the government has increased the health budget to meet the constitutional obligations which is that health budget should reach 3% of GDP by 2017.Therefore The healthcare budget increased by EGP9.5bn, rising from EGP 42.1bn in the FY 2013/2014 budget to EGP 51.6bn in 2014/2015 (MOF,2015).

Unfortunately, health budget is nearly 5% of the total government budget; half the regional average (9.9) and a third of its commitment under the Abuja Declaration*, the percentage of health budget to the total government budget is also 1.7 in FY 2014/2015 half the constitutional obligation which supposed to reach by 2017 shown in figure (5) below.

When compared with other middle-income countries in the region, Egypt's OOP spending (72%) is much higher than regional average of (42.4%) (WHO, global health expenditure database,2015). The comparison also shows that the proportion of government spending from total health expenditure (THE) amounts only 26 percent compared to 52 percent of the regional average (NHA,2008/09, WHO, global health expenditure database,2015). Low investment has led to a fragmented and geographically imbalanced healthcare system, with people increasingly turning to private care. Just over half of Egyptians have health insurance, compared to 99% in Tunisia, 98% in Iran and 83% in Jordan (Ministry of Health and Population, 2010). This makes healthcare unaffordable to many and contributes to harsh disparities in access to essential health services and wide urban-rural disparities

*Abuja Declaration :

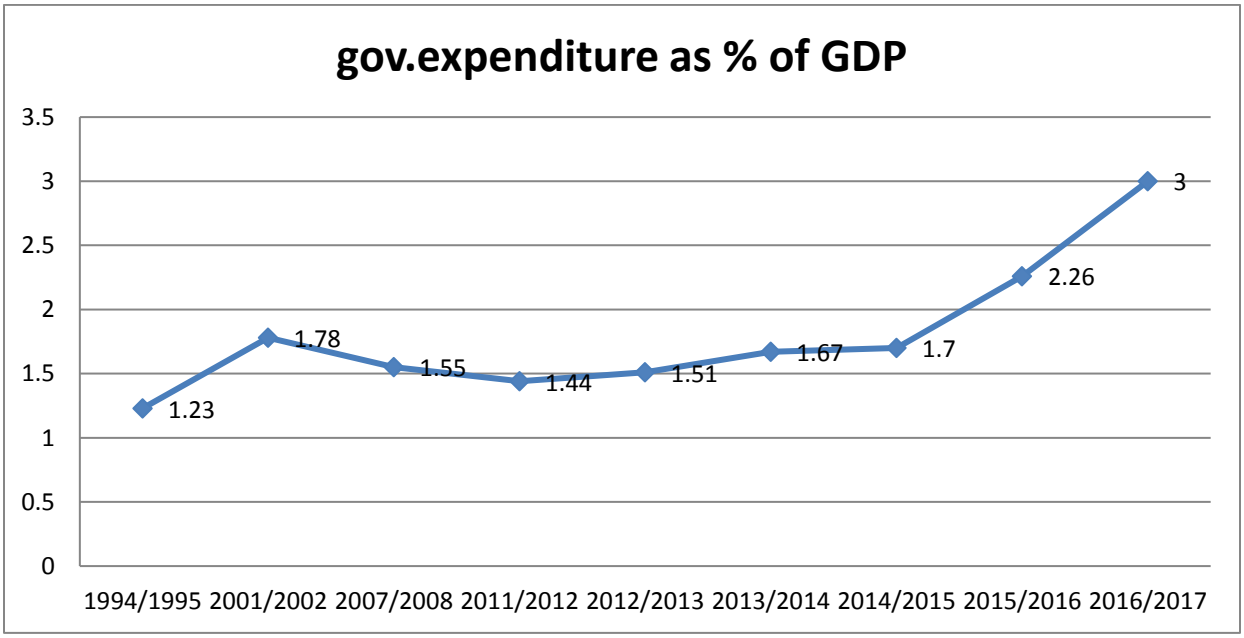
, the African Union countries met in 2001and agreed to set a target of allocating at least 15% of their annual budget to improve the health sector and urged donor countries to scale up support.(WHO,2011)

Table 5: Egypt compared with other Low-Middel- income Countries in region

LMICs in the region	% Of GDP spent on health (2013)	Gov. heath spending as % of THE (2013)	Gov. health spending as % of total gov. budget (2013)	OOP as % of THE
Algeria	7	74	9	25
Djibouti	9	60	14	40
Egypt	5	26*	6	72*
Iran	7	41	18	52
Jordon	7	66	13	24
Lebanon	7	51	11	34
Libya	4	70	4	30
Morocco	6	34	6	58
Syria	3	46	5	54
Tunisia	7	59	13	35
Regional average	6.2	52.7	9.9	42.4

Source: Data is derived from NHA. LMIC: low-&middle-income countries (WHO, global health expenditure database)

Figure5: The Governmental Expenditure as Percentage of GDP



Source: MoHP, planning department 2016

Table 6: Egypt Health Expenditure Indicators for year 2011/2012

Health Account Indicators - 2011/2012	Value	US dollars
Total Health Expenditure (THE)[1]	LE 82.5 Billion	13.0 Billion
Current Health Expenditure (CHE)	LE 79.6 Billion	12.6 Billion
Capital Formation	LE 2.82 Billion	444 million
THE per capita	LE 999	158
THE % of GDP	5.2%	-
General Government Health Expenditure (GGHE)	LE 23.6 Billion	3.74 Billion
GGHE % of CHE (GGHE % THE)	30% (29%)	-
GGHE per capita	LE 286	45.0
GGHE % of General Government Expenditure	5.6%	-
GGHE % of GDP	1.5%	-
Out of pocket Expenditure (OOP)	LE 48.0 Billion	7.61 Billion
OOP per capita	LE 582	92.0
OOP % of CHE (OOP % of THE)	60% (59%)	-
Corporation health expenditure	LE 7.05 Billion	1.11 Billion
Corporation health expenditure % of CHE	8.9%	-
Key macro indicators - 2011/2012		
Total Population (million)	82.5	
GDP (LE Billion)	1,580	
GDP per capita (LE)	19,200	
Exchange rate LE-US$	6.31	

Source : NHA 2011/2012

[1] This report still refers to THE for the sake of ease in comparability with previous HA studies. In the SHA 2011 terminology the nomination "THE" is in principle removed and replaced by the concept of CHE plus HK.

2.3: Health Equity and Disparities

Health equity has been defined as: " the absence of systematic disparities in health or its social determinants among more or less advantaged social groups". One can generally distinguish between vertical equity (unequal treatment of unequal groups) and horizontal equity (equal treatment of equal groups) (Braveman and Gruskin 2003),

For healthcare financing, vertical equity refers to the idea that households with greater ability to pay should pay more to obtain healthcare. Horizontal equity in health is concerned with the extent to which persons receive equal treatment for equal needs regardless of their income or socio-economic position. inequity can be represented as disparities* to access and use healthcare as the rich have better access to quality care while the health needs of the poor are largely unmet. Thus, health systems should do more effort for achieving health equity by providing all people with a fair opportunity to attain their full health potential and promote those practices to ensure equity of access and utilization of quality healthcare services (Jacobs & El-Sadr, 2011)

Health equity also cannot be concerned only with health, in isolation from other issues such as fairness, social justice, economic allocation (SDSN 2014) It is inefficiently targeted to the poor as they less inclined to report illness than the rich, at the same time, the poor accept illness as a normal feature of life and do not consider it an event worth reporting. Thus improving targeting to the poor is not only by rearranging the public subsidies but also by addressing the constrains that prevent the poor from accessing these services (Castro-Leal et al, 2000)

*Health Disparity vs. Healthcare Disparity

Health disparity: A higher burden of illness, injury, disability, or mortality experienced by one population group relative to another group.

Healthcare disparity: Differences between groups in health insurance coverage, access to and use of care, and quality of care (KFF,2012).

2.3.1Health disparities in Egypt

Health disparities in Egypt has been a challenge resulting in some groups receiving lower quality healthcare than others and experiencing poorer health outcomes (KFF,2012); to name a some examples of health status disparities; in the poorest quintile 46 percent of births took place without trained staff (DHS, 2008). Neonatal mortality is disproportionately higher between disadvantaged populations and vulnerable groups as in rural Upper Egypt (DHS, 2014). For example, a child in urban Lower Egypt has a better chances than a child born in rural Upper Egypt, because child in rural upper Egypt has a 50 percent greater likelihood of dying from neonatal problems (DHS, 2014).

Communicable Diseases VS Non-Communicable Diseases (NCDs):

Globally, an epidemiological transition is taking place as non-communicable diseases and injuries are generally on the rise, while communicable diseases are generally on the decline (IHME, 2013). Egypt is no exception. Communicable diseases have largely been controlled; Egypt has been declared Polio free since 2006 and that has been sustained since then. Ongoing elimination of Filariasis, Schistosomiasis and Measles is taking place. However, Hepatitis continues to be public health issue (WHO, 2010).

On the other hand, NCDs are now posing the heaviest burden of the disease pattern in Egypt. 72 percent of all mortality and morbidity are due to NCDs As captured in units of disability-adjusted life-years (DALYs)*, (IHME, 2013; WB,2015)

*Disability-adjusted life years (DALYs) quantify both; years of lost due to premature mortality (YLLs) and years of lost life due to disability (YLDs) within a population (WHO,2010).

In 2010, the top three leading causes of death were stroke , ischemic heart disease, and cirrhosis which are different from the leading causes of death in 1990 which were diarrheal diseases, lower respiratory infections and preterm birth complications (IHME, 2013).

The prevalence of hypertension and diabetes mellitus in the adult population is around 26 percent and 9 percent, respectively (WHO, 2010), which is found to be more concentrated in wealthier population segments (DHS,2009). This could be referred to the fact that NCDs are more attributed to wealthy lifestyle, though it also can be explained that access to health services is more concentrated among the rich and so the poor may be left with a latent undiagnosed burden of NCDs (WB, 2015). Despite the aforementioned data about NCDs burden, Egypt still does not have a unified and budget calculated national NCD plan (WHONCDs, 2014; WB, 2015).

Hepatitis C (HCV):

Egypt is considered the country with the highest prevalence of hepatitis C virus (HCV) infection in the world. The estimated prevalence for hepatitis C virus is 14.7 percent among 15- to 59-year-olds (DHS,2009)(note: prevalence greater than 3-4 percent is considered high by the WHO) (wasley&Alter, 2000).

Chronic Hepatitis C Virus is the main reason of liver cancer ,liver cirrhosis and one of the top five leading causes of death in Egypt (IHME, 2013; WB,2015). In general, the overall prevalence of HCV varies greatly among specific groups and socioeconomic classes. The overall average prevalence in rural areas is about 20 percent higher than the national average (Mohamoud YA. et al, 2013).

Worryingly, little evidence exists of a decline in HCV prevalence, either among the general population or among high-risk groups (Mohamoud YA. et al, 2013).

Under Nutrition:

Another example for disparities between Egypt's region, while Egypt is not on target to meet any of the four global nutrition goals*, children in Upper Egypt and frontier governorates tend to be more affected (WB,2015; IFPRI, 2013). To name few examples, the highest proportions of underweight children are in Upper Egypt governorates (WHO,2010). Children in rural Upper Egypt and in three frontier governorates tend to be more anemic than children in other areas (45 percent and 30 percent, respectively) (DHS, 2014).

Global nutrition goals of the World Health Assembly (WHA) are: reducing child stunting (height-for-age) by 40 percent, reducing anemia in woman of reproductive age by 50 percent, preventing an increase in child overweight, and reducing and maintaining child wasting (weight-for-height) to less than 5 percent (WB,2015).

As the health improvements have been unevenly distributed across the population, the same applies for health system financing. For example, around half of the population does not have any type of formal coverage; especially poor or informal sector employees (HIO,2011). Based on the 2008 demographic health survey, only 14 percent of the poorest quintile are covered by any health insurance schems compared to 47 percent among the wealthiest quintile (DHS,2008). A person in the informal sector who doesn't have any sort of health coverage can expect paying 70 percent more on OOP than an insured peer (NHA, 2009). Due to catastrophic OOP health expenditures, each year 7 percent of population is pushed into poverty (WB, 2010).

Moreover, lowest income quintile spends 21 percent while the highest income quintile spent only 13.5 percent .Thus, the poor spend more on health care (as a percentage of total income) than their more wealthy counterparts e.g. (NHA, 2008/09).

In a related context, disparities in human resources for health are highly prevailing across different regions of the country. While the number of doctors and nurses per 1000 population has increased since the last two decades to be 2.8 and 3.5, respectively, imbalances in terms of expertise, location and accessibility are highly prominent in Upper Egypt and the border governorates. One example is the lack of adequate staff in the rural governorates of Upper Egypt compared to delta governorates (an average of 1.5 nurses per health unit in Upper Egypt compared to 29 nurses per unit in the delta) (MoHP, 2014). It is noteworthy that, public spending, whether at the MOH, HIO, or university hospitals, is not linked to performance, but rather based on historical budgets, the number of personnel employed, (NHA, 2007/08).

2.3.2: Health Expenditure & Health Outcomes

Health outcomes

The most widely used indicators of measuring health status are infant, under-five, and maternal mortality rates. Infant mortality rate is defined as "the number of deaths of infants under one year of age per 1000 live births in a given year". Worldwide, each year around 11 million infants die, of which more than 90% occur in the developing world (UNICEF, 2011).

The under-five mortality rate is "the probability of dying between birth and exactly five years of age per 1000 live births". Although it has been declining over time, number of deaths worldwide among children under 5 year old is stood at about 7 million (UNICEF, 2012).

Generally ,Infant mortality rate (IMR) is considered as an main national indicator of health outcomes because it is particularly affected by different factors, like socio-economic conditions and development indicators (Sartorius & Sartorius, 2014), Reducing infant mortality is a key challenge to achieve Millennium Development Goal (MDG) 4 as the rate of IM is varying between regions and countries .

Infant mortality is attributed to different determining factor, that include proximal factors (e.g., infectious), intermediate factors (e. g. water and sanitation), and distal factor (e.g., socioeconomic status, education) factors shown in figure (7). (Sartorius & Sartorius, 2014).

Maternal mortality (survival) emerged as a significant determinant of infant mortality, consequently, living in unhygienic environment, drinking unclean water, and absence of proper sanitation are known risk factor s for infant and child mortality. The healthcare inputs, health behaviors out-of-pocket health expenditure also affect infant mortality (Sartorius & Sartorius, 2014)., (Breger&Messer, 2002)

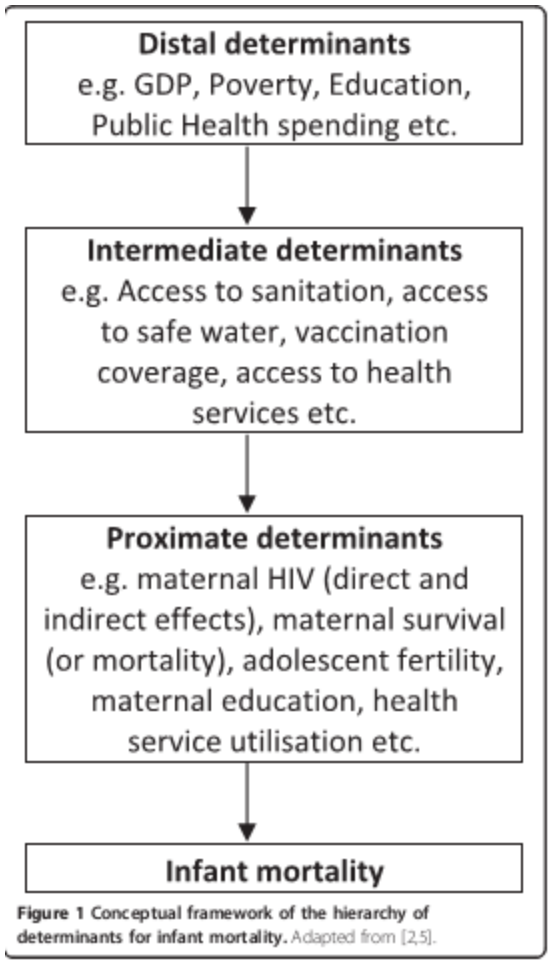


Figure (6): hierarchy of determinant for infant mortality

Source: (Sartorius & Sartorius, 2014).

The Relation between Health Expenditure and Health Outcomes

There was a debate regarding the nature of relation between public health expenditure and national health outcomes. Several researchers have examined the relationship between health care expenditures and health outcomes such as infant, under-five, and maternal mortality rates (Akinci et al., 2014). Public financing of healthcare expenditures may improve access to healthcare and may thus improve health outcomes (Breger & Messer, 2002)

It is found that 10 % increase in governmental health expenditure has a larger impact in reducing under-five mortality in low and middle income countries include Egypt. F. Akinci, et al provided many reasons to choose mortality rate as health outcomes indicator not life expectancy because mortality associated directly with changes in economic condition, life expectancy is improved recently in most of developing countries , finally mortality in developing countries depends on inability to access hospitals and medicines, maternal and infant nutrition and diseases, female literacy , water and sanitation, GDP and economic inequalities, and this study finds that an increase of per capita government health expenditures significantly reduces infant, under-five, and maternal mortality rates (F. Akinci, et al, 2014).

Another comparative study for analyzing the relationship between public health expenditure and national health outcomes amongst developed countries using mixed effect model, using two public health outcome indicator, which are infant mortality rate and life expectancy at birth. It was found that government health expenditure has a negative relationship with infant mortality rate and a positive relationship with life expectancy at birth. The study results suggested that higher government spending in medical goods and services can improve the results and provide positive outcomes in under-five mortality (Kim& R. Lane, 2013).

Another study examines the relationship between country health spending and selected health outcomes (infant mortality and child mortality), for low and middle-income countries for year 1995and 2006.it was found that health spending has a significant consequence on reducing infant and under-5 mortality by using fixed effects model .Government health spending also has a significant effect on reducing infant and under 5 mortality rate indicating that good governance increases the effectiveness of health spending (Farag, et al, 2013).

Azmat Gani in 2009 provides empirical evidence on the relationship between per capita public health spend and three main measures of health outcomes (IMR, U5-MR) using cross country data from some Pacific Island countries for 12 years between 1990 and 2002. The analysis indicates that per capita health expenditure is significant factor in determining health outcomes, the study results suggest that increase in per capita health expenditure by a 10% would lead to an nearly 6.6% reduction in IMR, (Gani,2009)

2.3.3: MDGs and SDGs

The MDGs intended -above all- to end poverty. Health enables sustainable development because health is a right for everyone to enjoy highest attainable standard of health, in addition, health is socially determined as75% of health outcomes depend on living and working condition and contributes to economic growth and development because healthy population means higher productivity (schirinding & Mulholland, 2002).

For illustrating the relation between health and sustainable development, SDGs provide a framework for integrating actions across multiple sectors in order to optimizing the equitable use of planetary resources and minimizing threats to sustainability. Hence, all people on the earth can benefit from the fruits of sustainable development and enjoy long productive lives enriched by health and wellbeing at all ages (SDSN 2014).

SDG N.3

By promoting SDG number 3: ensure healthy lives and promote well-being for all at all ages". We can ensure benefits of development will extend to next generations, reduce health inequalities within and between social groups, and improve the performance of health system (SDSN, 2014).

Universal access health services are among the goals being considered for the post-2015 agenda to accomplish sustainable development goal, universal health coverage should be achieved at every stage of life in presence of well governed health system and adequate resources and policies. UHC must ensure equitable access and utilization to affordable, responsible, health services with acceptable quality level to all people. Many important services should be included such as preventive, curative, promotive, and rehabilitative and palliative services. At this stage, the government plays the role of enabler for delivering health services and promote extending determinant of health across multiple sectors for better health (SDSN 2014).

Thus, development will be sustainable when it benefits the health and wellbeing of both present and future generation. Development polices and economic strategies must be aligned to health objectives, as we can't achieve sustainable development where health is scarified for short term economic gain (WHO, 2002)

Egypt Sustainable development strategy 2030

The SDS deals with the main challenges that affect sustainable development, namely related to physical resources; energy, land, water, and environment, human development resources; population, health, and education, inadequate governance system, and dis-incentivized innovation. SDS sets specific goals and objectives for these elements to turn them into development catalysts instead of being major challenges (SDS Egypt 2030, 2016).

Developing political, economic and social vision to the Egyptian state in the long run to be the basis of the development plans of long-term in order to enabling Egypt to be an influential actor in the international environment characterized by dynamic and successive developments planning for the future and dealing with the various challenges to identify possibilities for Egypt and focus on the competitive advantages compatibility with global development trends, compatibility with sustainable development strategy for Africa 2063.

They revised all the local and international strategies such as Egyptian government strategy 2017 and sectors strategies, population strategies, visions and strategies of private sectors and civil society in addition to international strategies such as European, Malaysian, India, turkey, Jordon (SDS Egypt 2030, 2016).

The government should allocate at least 5 % of national GDP as public financing for health and reduce OOP spending on healthcare. One of the strategic objectives is improving health status of all citizens in presence of equity and equality through improving life expectance rate to be 75 in 2030 instead of 71 in 2014, improving maternal mortality rate to be 31 for 100000 in 2030 instead of 50 in 2012, another indicator for this objective is under five mortality rate that should be decreased from 27 for 1000 in 2014 to 15 in 2030 (SDS Egypt 2030, 2016).

Chapter 3 Methodology

The type of research that tackled in this study is secondary analysis; it depends on collecting data from different resources, data is about the 27 Egyptian governorates divided into 4 regions. The work is mainly analytical and tries to provide specific knowledge about the research objectives. In addition, no hypothesis has been developed as this beyond the scope of work.

Data type:

Secondary grouped data are collected from available literature in the form of books, reports, researches. No primary data has been collected as collection of primary data is beyond the scope of this study.

Source:

Data were obtained from different sources such as: MOHP, MOF, CAPMAS, annual budget plan, ministry of planning reports, international organizations reports such as (WHO, WB, UNDP)

Year of study

The year of study is 2013-2014, the choice of this year is due to the availability of updated data after the 25thof January revolution which has a great impact on most aspects of life (Abdou & Zaazou, 2013).

Analysis tool

Data will be fed into computer program Statistical Package for the Social Sciences (SPSS) version 18

Types of variables:

Different types of variables are used in analysis, the source and the year of each variable are illustrated in Table (7); variables can be categorized as follows:

Socio-economic and demographic indicators:

Total Population, Population Density Inhabited Area, urbanization, Unemployment rate, Illiteracy rate, without primary education%, GDP/ capita %, Poverty %,

Health indicators:

N. of hospital beds, N. of hospital beds per 10000, N. of physicians, Aged Population % (>60), <5 Population %, IMR,U5-MR.

Health expenditure indicators

Government health expenditure, Government health expenditure per capita, insurance coverage %, HIO expenditure, OOP, OOP/ capita.

Table (7) illustrated the source & the year of variables (compiled by the author)

N.	Variable	Data source	Year
1	Region	CAPMAS	2013
2	Governorate	CAPMAS	2013
3	Total Population	CAPMAS	2013
4	Population Density Inhabited Area	CAPMAS	2013
5	Urbanization %	CAPMAS	2013
6	Poverty %	CAPMAS	2013

7	Unemployment	CAPMAS	2013
8	Illiteracy	CAPMAS	2013
9	Without primary education	CAPMAS	2013
10	GDP/ capita	UNDP	2010
11	Poverty rate	CAPMAS	2013
12	N. of hospital beds	MOHP	2014
13	N. of hospital beds per 10000	MOHP	2014
14	N. of physicians	MOHP	2014
15	physicians density per 10000	MOHP	2014
16	Aged Population % (>60)	MOHP	2013
17	<5 Population %	MOHP	2013
18	IMR 2000	MOHP	2000
19	IMR 2014	MOHP	2014
20	U-5M2000	MOHP	2000
21	U-5 M2014	MOHP	2014
22	Gov. Health Exp.	MOHP	2012/2013
23	Gov. Health Exp. / Capita	MOHP	2012/2013
24	Insured Population %	HIO	2013
25	HIO expenditure	HIO	2012/2013
26	OOP	CAPMAS	2012
27	OOP/ capita	CAPMAS	2012

Study design:

The analysis is divided into 4 main chapters:

Section 1: The Demographic and Socio-Economic Characteristics

In order to understand the demographic and Socio-economic characteristics of Egyptian governorates, as well as highlighting the governorates which are deprived and suffer more the study will conduct descriptive analysis for different variables categorized into 3 parts:

- Demographic
- Social
- Economic

Section 2: Health System In Egypt

In order to understand the health system in Egypt, disparities between Egyptian governorates through health outcomes and quantify the difference through 15 years to detect to what extent the health outcomes improved or not, we chose data from year 2000 to 2014 to define the gap. The study will conduct a descriptive analysis for different variables classify into 3 parts:

- Healthcare system inputs
- Health needs
- health outcomes (IMR, U-5MR)

Section 3: Health Expenditure Pattern

Describing the health expenditure pattern in the Egyptian governorates through descriptive analysis for different variables divided into 3 parts

- Governmental health expenditure pattern
- Health insurance in Egypt
- Private health expenditure represented by OOP

Section 4: The Correlation and Association between Government Health Expenditure and Other Factors Affect Health Outcomes

Examining the correlation between factors affects health outcomes and the association between government health expenditure and selected health outcomes. This chapter divided into 2 parts

Part A:

The study will analyze the relations between different variable affect and affected by heath expenditure pattern such as (Government health expenditure / capita, GDP/ capita, poverty %, N. of hospital beds / 10000, physician density / 10000, Urbanization %, Insurance coverage %, OOP/ capita, illiteracy, Unemployment) using Spearman Rank correlation coefficient*

Part B:

Investigate the association between governmental health expenditure and health outcomes using linear Regression analysis**. Many variables used in regression analysis. The study will follow F. Akinci, etal (2014) and A Gani (2009) to select the key study and control variables in the regression framework. In particular the data set includes the following variables

Dependent variables

- Infant mortality (death between birth and age 1 per 1000 live births)
- Under-five mortality (probability of death by age 5 per 1000 live births)

*The Spearman Rank Correlation is one type of correlation coefficient used when it is not convenient, economic or even possible to give actual values to variables but only to assign rank order to instances of each variable. It may also be a better indicator that the relationship exist between two variables when the relationship is non-linear

**Linear regression aims to find a linear relationship between a response variable and a possible predictor by the method of last squares.

Independent variables used in regression analysis:

- Per capita government expenditures on health (PPP int. LE)
- Per capita OOP expenditures on health (PPP int. LE)
- Poverty rate (%)
- GDP/ Capita Per capita GDP (PPP int. LE)
- Physicians density (per 10000 population)
- Insurance coverage (%)
- Urbanization (%)
- Adult illiteracy rate (%)

The study measures health outcome by using IMR and U-5MR, rather than life expectancy, due to many reasons. First, compared to life expectancy, mortality is more strongly associated to changes in economic conditions in the developing world. Second, in developing countries, declines in mortality rates explain a large portion of improvements in life expectancy (Cutler et al., 2006). Finally, existing literature shows that in developing countries, mortality depends on access to medicines and health facilities, water and sanitation, maternal health, infant nutrition, maternal and infant disease exposure, and female literacy in addition to per capita GDP and economic inequality.

Chapter 4.Results & Discussion

4.1 Demographic and Socio-Economic Characteristics

Understanding the demographic and socio-economic characteristics of Egypt governorates:

A) Demographics of Egypt governorate :

Egypt is divided into 4 geographical regions as shown in Table [8] namely Urban governorates, Lower Egypt, Upper Egypt and Frontier. The country is divided into 27 governorates which are: Cairo, Alexandria, Port Said, Suez, Damietta, Dakahlia, Sharkia, Kalyubia, Kafr El-Sheikh, Gharbia, Menoufia, Behera, Ismailia, Giza, Beni Suef, Fayoum, Menya, Assuit, Souhag, Qena, Aswan,Luxor , Red Sea , New Valley, Matroh , North Sinai, South Sinai.

Egypt's total population is 83,556,117 in 2013; the average population in each governorate is 3,094,671. Cairo has the highest population, with total population 8,952,583, and South Sinai is the least populated with total population 161,405. The highest Population Density Inhabited Area is 47015 in Cairo and the least is 10 in South Sinai while the average is 3530.

Regarding the urbanization, there are 4 governorates which do not contain any rural areas; the remaining governorates include urban and rural areas.

Table 8: Descriptive statistics for demographics indicators for Egypt Governorates

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Population	27	161405	8952583	3094671.00	2418688.618
pop.denisty	27	10	47015	3529.85	8834.341
urbanization %	27	18.9	100.0	46.963	28.7604
Valid N	27				

Source: Author calculation.

Table 9: Demographics Indicators for Egypt Governorates

Region	Governorate	Total Population	Population Density Inhabited Area	Urbanization %
urban governorates	Cairo	8,952,583	47015	100
	Alexandria	4,606,101	2749	98.8
	Port Said	641,112	485	100
	Suez	592,119	66	100
lower Egypt	Ismailia	1,109,454	219	45.4
	Damietta	1,273,448	1904	38.7
	Dakahlia	5,695,526	1610	28.2
	Sharkia	6,170,810	1257	23.1
	Kalyubia	4,874,032	4544	44.7
	Kafr El-Sheikh	3,016,854	870	23.1
	Gharbia	4,543,756	2339	30
	Menoufia	3,752,671	1541	20.6
	Behera	5,478,034	778	19.5
Upper Egypt	Giza	7,174,903	6024	58.6
	Beni Suef	2,679,001	1956	23.2
	Fayoum	2,976,832	1618	22.5
	Menya	4,845,690	2009	18.9
	Assuit	4,003,544	2544	26.5
	Souhag	4,331,035	2717	21.4
	Qena	2,875,217	1652	19.7
	Luxor	1,089,467	4805	37.8
	Aswan	1,355,975	1350	42.3
Frontier	Matroh	406,032	237	70.6
	New Valley	213,935	198	48
	Red Sea	328,242	4615	95.1
	North Sinai	408,339	194	60.2
	South Sinai	161,405	10	51.1

Source: CAPMAS, 2013

B) Social conditions

The study evaluates the social conditions of the governorates through 3 indicators: the unemployment rate, illiteracy rate, without primary education%.

The unemployment rate in Egypt is 12.9%, the highest rate is in Port-said 25.9% while the lowest rate is in South Sinai 3.1%, since most of population in South Sinai comes from different governorates to work in tourism. Lower Egypt has the lowest unemployment rate while the highest unemployment rate is in urban governorates because the number of graduates each year in urban governorates from universities is higher than the job opportunities available.

Average illiteracy rate in Egypt is 27.56%; Red sea governorate has the lowest illiteracy rate of 12.6% while Menya has the highest illiteracy rate of 41.2%. Upper Egypt region has the highest illiteracy rate while Lower Egypt has the lower illiteracy rate. At the same time the average population without primary education in each governorate is 8.70%. New Valley has the least percentage (3.1%) of population without primary education while Matrouh has the highest percentage of 19 %. Lower Egypt region has the least percentage of population without primary education, while frontier region has the highest percentage of population without primary education. Therefore, it should be a special health awareness program targeting the Upper Egypt and Frontier governorates considering the illiteracy problem in those regions

Table 10: Descriptive statistics of Social Indicators for Egypt Governorates

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Unemployment	27	3.1000	25.9000	12.877778	3.9857760
Illiteracy	27	11.6300	41.2900	27.557037	8.8695893
Without primary education	27	3	19	8.70	4.049
Valid N	27				

source: Author calculation.

Table11: Social Indicators for Egypt Governorates

Region	Governorate	Unemployment	Illiteracy	Without Primary Education
urban governorates	Cairo	16 %	20.30%	7.21%
	Alexandria	18.4%	19.47%	7.44%
	Port Said	25.9%	16.39%	3.34%
	Suez	17.7%	17.14%	5.10%
lower Egypt	Ismailia	13.1%	22.83%	7.89%
	Damietta	10.6%	22.42%	6.97%
	Dakahlia	11.8%	27.91%	5.66%
	Sharkia	13.8%	32.15%	8.30%
	Kalyubia	13.7%	27.52%	8.50%
	Kafr El-Sheikh	11.7%	34.31%	6.89%
	Gharbia	15.5%	25.85%	5.81%
	Menoufia	11.1%	27.44%	6.12%
	Behera	8.2%	36.66%	10.95%
Upper Egypt	Giza	12.7%	26.01%	8.85%
	Beni Suef	10.9%	40.54%	16.04%
	Fayoum	12.2%	40.89%	13.51%
	Menya	12.5%	41.29%	14.13%
	Assuit	12.8%	39.06%	14.52%
	Souhag	13.1%	38.50%	11.02%
	Qena	9.3%	34.77%	7.46%
	Luxor	12.5%	27.80%	5.32%
	Aswan	15.3%	23.00%	4.01%
Frontier	Matroh	10.7%	35.08%	19.07%
	New Valley	9.6%	18.17%	3.20%
	Red Sea	14.2%	12.69%	6.54%
	North Sinai	11.3%	24.22%	7.75%
	South Sinai	3.1%	11.63%	13.20%

Source: CAPMAS, 2013

C) Economic conditions

The study evaluates the economic conditions of the governorates by reviewing GDP per capita and poverty rate as representative indicators for the economic conditions of the Egyptian governorates.

It is found that GDP/capita in average is 8916.6; New Valley has the highest GDP/capita 12682.2, while Qena has the lowest GDP/capita 6387.5. Lower Egypt is the best region while urban governorates region is the worst.

The average poverty rate between governorates is 27.48%, There are huge differences in rates of poverty between governorates. Asiout has the highest poverty rate of 60%, while North Sinai and South Sinai has the lowest poverty rate of 3%. Upper Egypt region is considered the poorest region.

Table12: Descriptive Statistics of Economic Indicator for Egypt Governorates

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
GDP/ capita	27	6387.5	12682.2	8916.685	1386.4988
Poverty %	27	3.0000	60.0000	27.475097	14.7821099
Valid N	27				

Source: Author Calculation

Table13: Economic Indicator for Egypt Governorates

Region	Governorate	GDP/ capita	Poverty rate
urban governorates	Cairo	7726.4	20%
	Alexandria	8978.3	26%
	Port Said	10549.7	22%
	Suez	8745.8	13%
lower Egypt	Ismailia	8970.2	18%
	Damietta	7883.5	13%
	Dakahlia	9111.5	16%
	Sharkia	8700.4	19%
	Kalyubia	8134.4	23%
	Kafr El-Sheikh	8927.9	19%
	Gharbia	8799.6	12%
	Menoufia	9854	19%
	Behera	9451.6	27%
Upper Egypt	Giza	8242.8	32%
	Beni Suef	8857.4	42%
	Fayoum	8433.7	34%
	Menya	8655.9	33%
	Assuit	8019.6	60%
	Souhag	7329.7	53%
	Qena	6387.5	57%
	Luxor	9105.6	50%
	Aswan	7057.4	32%
Frontier	Matroh	10346.1	22%
	New Valley	12682.2	9%
	Red Sea	8460.7	32%
	North Sinai	8884	3%
	South Sinai	12454.6	36%

Source: GDP/capita: Human Development Report, 2010

Poverty rate: CAPMAS, 2013

After analyzing the socioeconomic condition in Egypt governorates, it is obvious that Lower Egypt considered the best region in most of indicators as shown in Table:14*. In contrast, there are huge differences between governorates and regions. Upper Egypt continues to have the highest poverty illiteracy rates and rural areas in the country. The depth and severity of poverty in this region is pronounced; low educational attainment, low public investment in services such as education and health result in low capacity to generate income.

*Table14:

We evaluate the governorates for each indicator rank and score them from 1 to 27, 1 is the worst governorate and 27 is the best and calculate the total for each region and governorate.

Table 14: Total indicators with values for governorates and regions

Row Labels	Total Population	Population Density Inhabited Area	urbanization %	Unemployment	illiteracy	Without Primary Education	GDP/ capita	Poverty %	Grand Total
Frontier	**125**	**102**	**104**	**94**	**93**	**72**	**95**	**102**	**787**
South Sinai	27	27	21	20	18	13	17	27	170
Red Sea	25	4	23	7	27	19	10	10	125
North Sinai	23	25	20	19	17	12	16	26	158
New Valley	26	24	18	25	24	27	27	25	196
Matrouh	24	22	22	23	7	1	25	14	138
Lower Egypt	**89**	**137**	**91**	**139**	**120**	**135**	**144**	**165**	**1020**
Sharqeya	3	18	7	8	10	10	12	19	87
Qalioubeya	6	5	16	9	13	9	7	13	78
Menoufeya	12	16	4	21	14	20	24	18	129
Kafr el-Shiekh	13	19	8	18	9	18	18	17	120
Ismailia	19	23	17	10	20	11	19	20	139
Gharbeya	9	9	12	5	16	21	14	24	110
Domiat	18	12	14	24	21	17	5	22	133
Daqahleya	4	15	11	17	11	22	22	21	123
Behira	5	20	2	27	6	7	23	11	101
upper Egypt	**112**	**85**	**81**	**135**	**69**	**90**	**76**	**45**	**693**
Sohag	10	7	5	11	5	6	3	3	50
Qena	15	13	3	26	8	14	1	2	82
Menia	7	10	1	14	1	4	11	7	55
Luxor	20	3	13	15	12	23	21	4	111
Giza	2	2	19	13	15	8	8	9	76
Fayoum	14	14	6	16	2	5	9	6	72
Beni Suef	16	11	9	22	3	2	15	5	83
Aswan	17	17	15	6	19	25	2	8	109
Asiout	11	8	10	12	4	3	6	1	55
urban governorates	**52**	**54**	**102**	**10**	**96**	**81**	**63**	**66**	**524**
Suez	22	26	27	3	25	24	13	23	163
Port Saied	21	21	26	1	26	26	26	15	162
Cairo	1	1	25	4	22	16	4	16	89
Alexandria	8	6	24	2	23	15	20	12	110

Source: Author calculation

4.2 Evaluating the Health System in Egypt

The study aims at understanding and evaluating the health system in Egypt through healthcare system input, health needs and health outcomes.

A) Healthcare system input in governorates

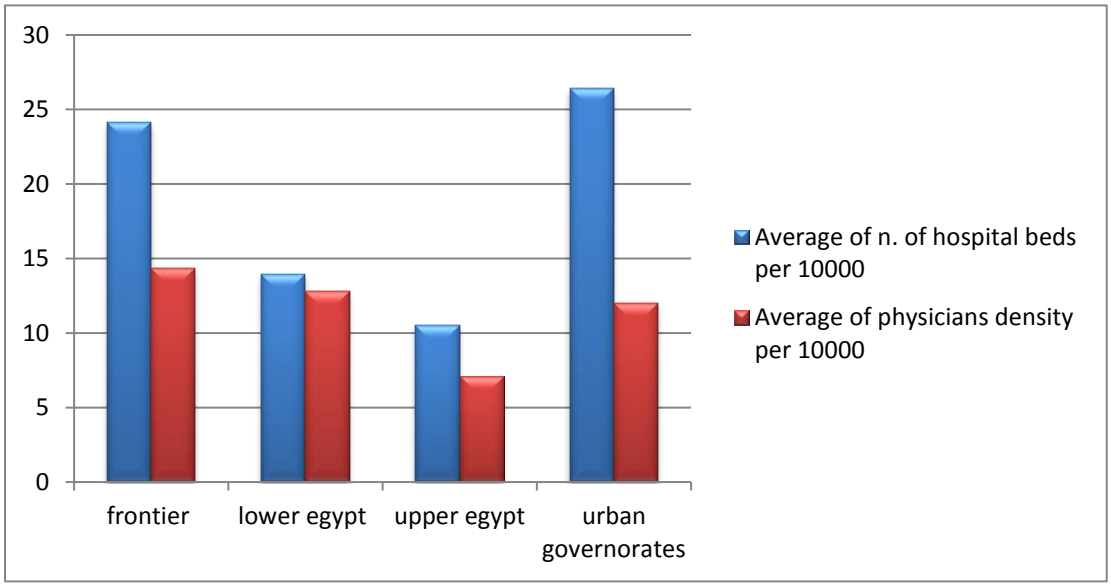
The total number of hospital beds in Egypt is 130900 including public and private sector. Cairo has the highest number of hospital beds (31930) while North Sinai has the lowest number (436), the average number of hospital beds per governorates is 4848, lower Egypt region is considered the highest region in number of hospital beds while frontiers region has the least number of hospital beds.

Cairo also has the largest number of hospital beds per 10000 people (35.6), while Qena has the least number (5.6) beds/10000 people; the average among governorates is 16.54 beds/10000 people. Urban governorates region has the highest number of hospital beds/10000 while Upper Egypt has the lowest.

The total number of physicians in Egypt is 85844, Dakahlyia has the highest number of physicians (10606) while New Valley has the lowest number (216), the average number is 3179, lower Egypt region is considered the best region in the availability of physicians while frontiers is the worst. In contrast physicians density in Damietta is the highest (19 physician /10000) while in Qena is the lowest (5.12), the average physician density is 11.08. Upper Egypt has the lowest number of physicians / 10000, while Frontier region has the highest number of physicians / 10000 due to low number of population in this region.

Regarding the above results, Upper Egypt region is also suffer from deficiency in number of hospital beds and physician who provided the medical services to patients as shown in Figure (7).

Figure (7): Average number of hospital beds/10000 and average physician density /10000 in regions



Source: Author calculation

Table 15: Healthcare Input Indicators Egypt Governorates

Region	Governorate	N. of hospital beds	N. of hospital beds/ 10000	N. physicians	physicians density/ 10000
urban governorates	Cairo	31930	35.67	9675	10.81
	Alexandria	13058	28.35	5641	12.25
	Port Said	1465	22.85	930	14.51
	Suez	1107	18.70	625	10.56
lower Egypt	Ismailia	1935	17.44	1026	9.25
	Damietta	2717	21.34	2423	19.03
	Dakahlia	9238	16.22	10606	18.62
	Sharkia	6552	10.62	4793	7.77
	Kalyubia	7623	15.64	4277	8.78
	Kafr El-Sheikh	2600	8.62	4399	14.58
	Gharbia	6772	14.90	5838	12.85
	Menoufia	5027	13.40	6606	17.60
	Behera	3939	7.19	3787	6.91
Upper Egypt	Giza	9035	12.59	5266	7.34
	Beni Suef	2412	9.00	1478	5.52
	Fayoum	2065	6.94	1931	6.49
	Menya	4144	8.55	3705	7.65
	Assuit	7260	18.13	4142	10.35
	Souhag	3856	8.90	3424	7.91
	Qena	1625	5.65	1473	5.12
	Luxor	1119	10.27	787	7.22
	Aswan	2014	14.85	878	6.48
Frontier	Matroh	1050	25.86	716	17.63
	New Valley	619	28.93	216	10.10
	Red Sea	810	24.68	421	12.83
	North Sinai	436	10.68	460	11.27
	South Sinai	492	30.48	321	19.89

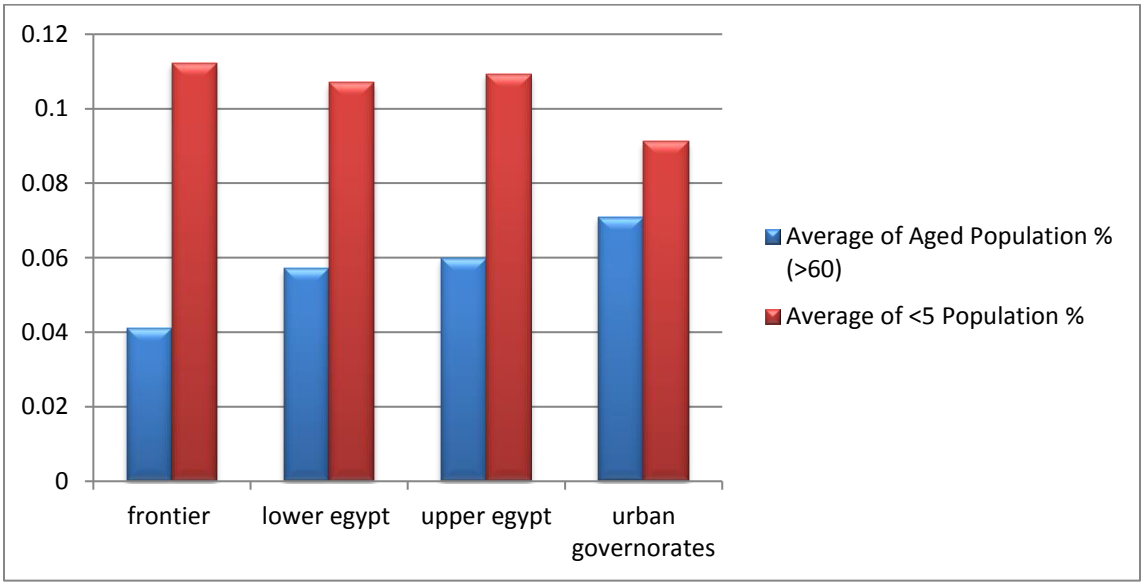
Source: MoHP,2014

B) Health Needs in Governorates

Regarding the health conditions of the Egyptian governorates it is noticed that the average population over 60 years of age is 5.7% in governorates. The percentage of population over 60 years of age is the highest in Cairo while the lower percentage is in Red Sea. Urban governorate is the region with the highest percentage of population over 60 years of age and frontier is the region with lowest number of aged population as shown in figure (8).

Concerning the percentage of population who are less than 5 years, the average is 10.6 %. The highest % of <5 Population is in Assuit, while the lower percentage is in Luxor. frontiers is the region with The highest % of population who are less than 5 years and Urban governorates is the region with lowest number of population who are less than 5 years, that reflected the higher health needs in all regions specially frontier region, where it has higher % of population < 5 years.

Figure (8): average aged population %(>60) and population %(<5) in regions



Source: Author calculation

Table 16: Health Needs Indicators Egypt Governorates

Region	Governorate	Aged Population % (>60)	<5 Population %
urban governorates	Cairo	7.79%	8.70%
	Alexandria	7.49%	8.37%
	Port Said	7.31%	8.77%
	Suez	5.77%	10.61%
lower Egypt	Ismailia	5.38%	10.93%
	Damietta	6.02%	10.54%
	Dakahlia	6.22%	11.12%
	Sharkia	5.55%	11.29%
	Kalyubia	4.99%	10.33%
	Kafr El-Sheikh	5.51%	10.07%
	Gharbia	6.35%	10.80%
	Menoufia	6.19%	10.32%
	Behera	5.25%	10.93%
Upper Egypt	Giza	5.35%	10.37%
	Beni Suef	5.86%	11.96%
	Fayoum	5.33%	12.12%
	Menya	5.91%	12.08%
	Assuit	5.76%	12.43%
	Souhag	6.07%	12.03%
	Qena	6.47%	10.94%
	Luxor	6.67%	6.44%
	Aswan	6.36%	10.01%
Frontier	Matroh	3.80%	9.38%
	New Valley	6.14%	9.66%
	Red Sea	3.72%	11.38%
	North Sinai	4.23%	12.41%
	South Sinai	2.68%	13.30%

Sources: MoHP, 2013.

Table 17: Health needs and health input variables in governorates and regions

Row Labels	<5 Population %	Aged Population % (>60)	N. Of Hospital Beds	N. Of Hospital Beds Per 10000	Physicians Density	Physicians Density Per 10000	Grand Total
Frontier	**58**	**112**	**15**	**94**	**16**	**93**	**388**
South Sinai	3	25	2	11	4	18	63
Red Sea	8	27	4	23	2	20	84
North Sinai	2	24	1	10	3	17	57
New Valley	22	10	3	26	1	13	75
Matrouh	23	26	5	24	6	25	109
Lower Egypt	**131**	**135**	**164**	**117**	**177**	**158**	**882**
Sharqeya	9	17	20	9	21	9	85
Qalioubeya	18	23	23	16	19	11	110
Menoufeya	19	9	19	13	25	24	109
Kafr El-Shiekh	20	18	14	5	20	23	100
Ismailia	13	19	10	18	10	12	82
Gharbeya	14	7	21	15	24	21	102
Domiat	16	12	15	21	14	27	105
Daqahleya	10	8	25	17	27	26	113
Behira	12	22	17	3	17	5	76
Upper Egypt	**99**	**110**	**132**	**73**	**122**	**55**	**591**
Sohag	6	11	16	6	15	10	64
Qena	11	5	9	1	11	1	38
Menia	5	13	18	4	16	8	64
Luxor	27	4	7	8	7	6	59
Giza	17	20	24	12	22	7	102
Fayoum	4	21	12	2	13	4	56
Beni Suef	7	14	13	7	12	2	55
Aswan	21	6	11	14	8	3	63
Asiout	1	16	22	19	18	14	90
Urban Governorates	**90**	**21**	**67**	**94**	**63**	**72**	**407**
Suez	15	15	6	20	5	15	76
Port Saied	24	3	8	22	9	22	88
Cairo	25	1	27	27	26	16	122
Alexandria	26	2	26	25	23	19	121

Source: Author calculation

C) Health Outcomes

The study use IMR and U5MR as indicator to measure health outcomes in Egypt governorate

Infant mortality rate IMR

In 2000, the average IMR was 24.9, the highest IMR was in Assuoit 46.5and the lowest IMR was in Kafr El-Sheikh , 13.5. Upper Egypt and urban governorates were considered the worst , while lower Egypt region is the best.

In 2014, the average IMR was 13.5 the highest IMR was in Cairo 25.2 and the lowest IMR was in Kafr El-Sheikh 9.3 urban governorates and upper Egypt region were considered the worst , while lower Egypt is the best

IMR was improved and the rate declined by 44.1 in average, the great improvement was in Sohag 61.9 while Alexandria has the little improvement in IMR 16.3

Figure (9): IMR in 2000-2004-2008-2014 in regions, source: author calculation

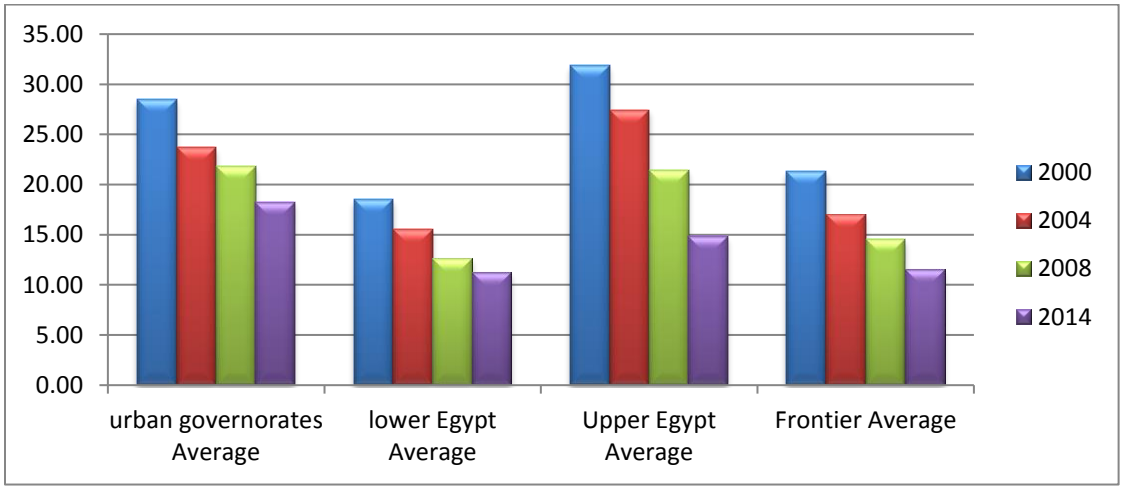


Figure (10) Relative difference IMR 2000-2014 in governorates, source: author calculation

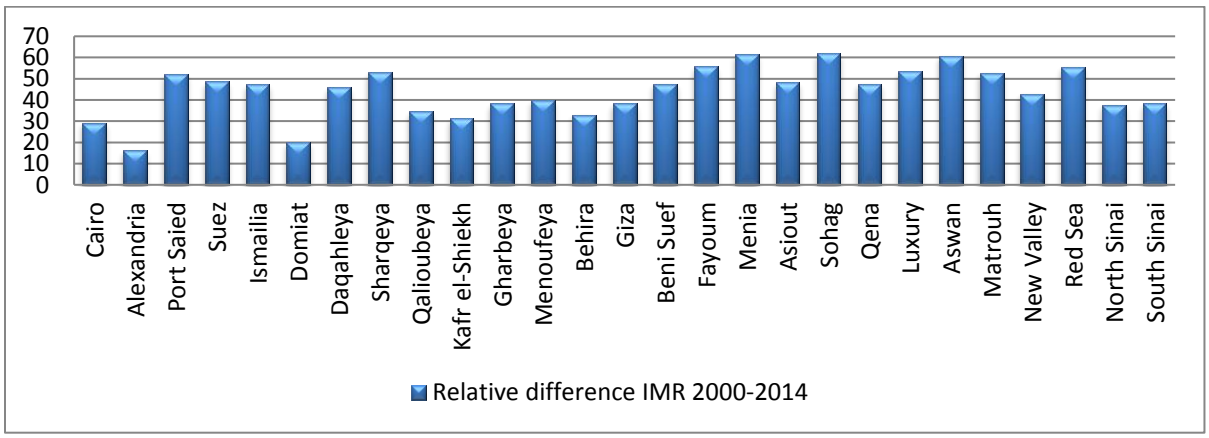


Table 18: IMR 2000-2014

Region	Governorate	2000	2004	2008	2014	Absolute difference 2000-2014	Relative difference 2000-2014
urban governorates	Cairo	35.6	32.8	29.5	25.2	10.4	29.19
	Alexandria	26.8	23.2	19.7	22.4	4.4	16.35
	Port Saied	30.4	16.2	23.4	14.6	15.8	52.03
	Suez	21.1	22.5	14.7	10.8	10.3	48.7
lower Egypt	Ismailia	21.4	17.2	15.5	11.3	10.1	47.15
	Domiat	16.4	13.4	11.8	13.1	3.3	19.96
	Daqahleya	20.7	15.7	12.4	11.2	9.5	45.92
	Sharqeya	21.2	17.7	14.8	10	11.2	52.86
	Qalioubeya	19.1	16.7	12	12.5	6.6	34.46
	Kafr El-Shiekh	13.5	13.7	10.7	9.3	4.2	31.25
	Gharbeya	18	16.7	12.6	11.1	6.9	38.22
	Menoufeya	21.2	16.4	13	12.8	8.4	39.74
	Behira	15.1	12.1	10.6	10.1	5	32.94
Upper Egypt	Giza	19	15.5	12.9	11.7	7.3	38.47
	Beni Suef	32.5	32.4	25.5	17	15.5	47.65
	Fayoum	31.6	22.4	17.3	14	17.6	55.76
	Menia	36.5	29.5	24	14.1	22.4	61.33
	Asiout	46.5	41	35.2	24.1	22.4	48.15
	Sohag	35.4	30.9	22.8	13.5	21.9	61.9
	Qena	26.8	25.2	20.6	14	12.8	47.67
	Luxury	28.5	28.2	22.3	13.3	15.2	53.37
	Aswan	30	22.1	12.6	11.8	18.2	60.68
Frontier	Matrouh	23.7	13.1	11	11.2	12.5	52.79
	New Valley	17.7	14.7	12.6	10.1	7.6	42.82
	Red Sea	22.5	15.6	13.2	10	12.5	55.54
	North Sinai	26.3	26.7	21.3	16.4	9.9	37.67
	South Sinai	16.3	14.8	14.7	10.1	6.2	38.22

Source: MoHP, 2000,2004,2008,2014

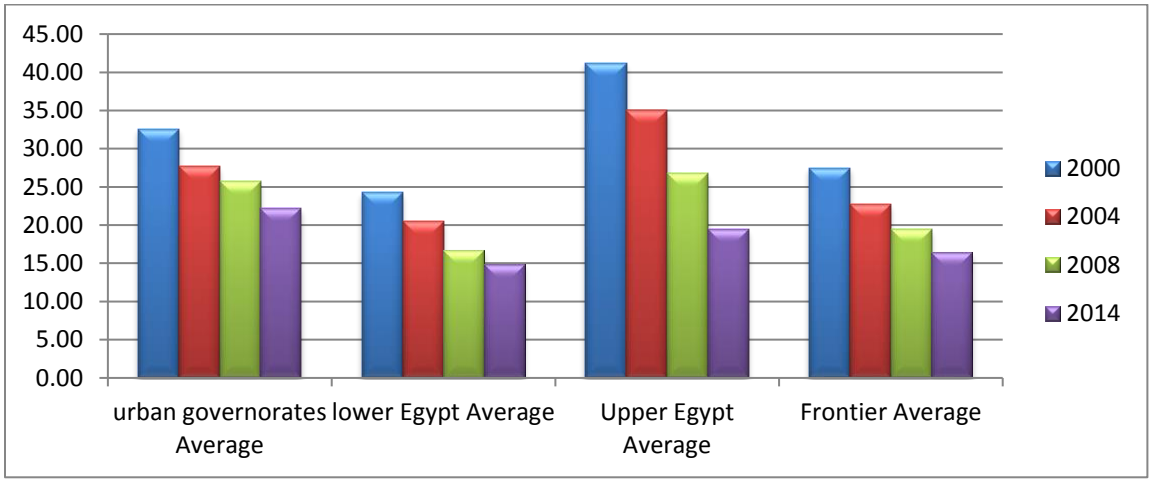
B) Under -5 Mortality Rate

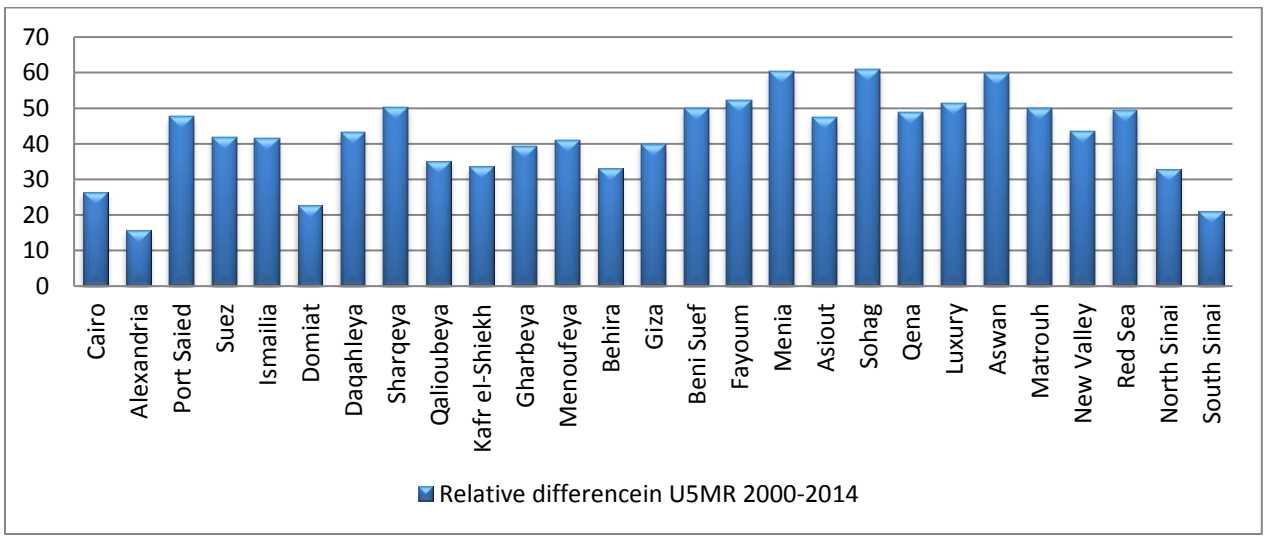
In 2000 ,the average U5-MR was 31.8, the highest U5MR was in Assuoit 58 and the lowest U5MR was in Kafr El-Shiekh 19, Upper Egypt region was considered the worst , while Lower Egypt is the best.

In 2014, the average U5-MR was 17.7 the highest U5MR was in Cairo 31.1and the lowest U5MR was in Kafr El-Shiekh 12.6 , Urban governorates region was considered the worst , while Lower Egypt is the best

U5MR was improved and the rate declined by 42.1 in average, the great improvement was in Sohag 60.8, while Alexandria has the little improvement in U5MR 15.5.

Figure (11): U5MR for years 2000-2004-2008-2014 in regions





Source: Author calculation.

Table 19: U5MR 2000-2014

Region	Governorate	2000	2004	2008	2014	Absolute difference 2000-2014	Relative difference 2000-2014
urban governorates	Cairo	42.3	39.5	35.5	31.1	11.2	26.48
	Alexandria	31.5	27.7	24.2	26.6	4.9	15.54
	Port Saied	32.3	18.0	25.8	16.9	15.4	47.71
	Suez	24.2	25.6	17.4	14.1	10.1	41.85
lower Egypt	Ismailia	27.2	23.9	20.7	15.9	11.3	41.51
	Domiat	20.6	16.7	14.4	15.9	4.7	22.82
	Daqahleya	26.6	21.0	16.6	15.1	11.5	43.30
	Sharqeya	28.9	24.0	19.7	14.4	14.5	50.18
	Qalioubeya	24.5	21.0	15.5	15.9	8.6	35.18
	Kafr el-Shiekh	19.0	18.6	14.2	12.6	6.4	33.51
	Gharbeya	23.3	20.7	16.3	14.1	9.2	39.42
	Menoufeya	28.0	21.8	17.3	16.5	11.5	41.12
	Behira	20.6	16.6	15.3	13.8	6.8	33.11
Upper Egypt	Giza	25.6	20.8	16.2	15.4	10.2	39.74
	Beni Suef	43.3	41.0	30.5	21.6	21.7	50.09
	Fayoum	38.7	28.7	22.0	18.5	20.2	52.20
	Menia	47.2	38.1	30.3	18.7	28.5	60.38
	Asiout	58.0	50.4	43.5	30.5	27.5	47.41
	Sohag	46.5	39.9	28.9	18.2	28.3	60.85
	Qena	35.5	33.0	25.9	18.1	17.4	48.94
	Luxor	37.1	34.9	28.9	18.1	19.0	51.27
	Aswan	39.2	27.8	14.8	15.8	23.4	59.73
Frontier	Matrouh	31.0	19.7	14.2	15.5	15.5	49.93
	New Valley	23.7	20.2	17.2	13.4	10.3	43.47
	Red Sea	28.5	20.0	16.6	14.4	14.1	49.43
	North Sinai	32.4	33.7	26.8	21.7	10.7	32.95
	South Sinai	21.8	20.3	22.5	17.2	4.6	21.095

Source: MoHP, 2000,2004,2008,2014.

4.3: Health expenditure pattern

Analyzing the health expenditure pattern in Egyptian governorates:

The study analyzes the health expenditures pattern in Egypt's governorates through different variables such as Government Health Expenditures, Government Health Expenditures / Capita, the percentage of insured Population, HIO expenditures, out of pocket OOP.

A) The total governmental health expenditures pattern over years

From Table20: We can notice that the governmental health expenditures as part of total governmental expenditures has been slightly changed over years , it was 4.39% in 2001/2002 and increased to 5.14 % in 2012/2013

Table 20: The Percentage of Governmental Health Expenditures to The Total Governmental Expenditures From (2001-2013)

Year	Gov. expenditure on health	Total Gov. expenditure	% of health expenditure
2001/2002	5,895.10	134,409.30	4.39
2002/2003	5,805.30	149,322.40	3.89
2003/2004	6,363.30	164,895.40	3.86
2004/2005	7,257.70	161,610.70	4.49
2005/2006	9,665.00	207,810.00	4.65
2006/2007	10,433.80	222,029.20	4.7
2007/2008	13,159.60	282,290.10	4.66
2008/2009	15,782.60	351,500.00	4.49
2009/2010	17,342.00	365,987.00	4.74
2010/2011	20,278.00	401,866.00	5.05
2011/2012	23,782.50	490,589.70	4.85
2013/2012	27,413.10	533,784.80	5.14

Source: MoHP, 2014.

B) The governmental expenditure pattern Egyptian governorates:

Firstly, the total governmental health expenditures is 26.53 billion LE, the governmental health expenditures in governorates in average is 982921275.2, the highest governmental health expenditures is in Cairo (5.1 billion) , while the lowest expenditures is in Red Sea (118 million), Lower Egypt region has the highest governmental expenditures 10,2 billion LE while Frontier region has the lowest expenditures 896,1 million LE. In contrast, the average governmental health expenditures per capita is 380.5, the highest governmental health expenditures per capita is in South Sinai 1248, while the lowest is in Fayoum 168.6.

Table21: Governmental Expenditure in Egypt Governorates

Region	Governorate	Gov. Health Exp.	Gov. Health Exp./ Capita
urban governorates	Cairo	5,147,598,630.14	574.98
	Alexandria	2,780,839,677.11	603.73
	Port Said	287,307,881.80	448.14
	Suez	252,860,717.05	427.04
lower Egypt	Ismailia	397,198,028.36	358.01
	Damietta	528,352,625.92	414.90
	Dakahlia	2,073,668,941.96	364.09
	Sharkia	1,516,996,501.56	245.83
	Kalyubia	967,448,313.45	198.49
	Kafr El-Sheikh	697,475,335.62	231.19
	Gharbia	1,737,069,438.68	382.30
	Menoufia	1,103,667,366.68	294.10
	Behera	1,269,422,123.27	231.73
Upper Egypt	Giza	1,478,600,683.11	206.08
	Beni Suef	591,018,809.06	220.61
	Fayoum	502,064,051.86	168.66
	Menya	891,330,038.09	183.94
	Assuit	1,244,371,189.84	310.82
	Souhag	842,851,836.23	194.61
	Qena	534,939,430.99	186.05
	Luxor	345,963,584.36	317.55
	Aswan	451,730,076.50	333.14
frontier	Matroh	222,077,303.39	546.95
	New Valley	157,960,911.59	738.36
	Red Sea	118,814,202.91	361.97
	North Sinai	195,735,367.79	479.35
	South Sinai	201,511,363.31	1,248.48
Total		26538874431	

Source: Author calculation

C) The Public Health Insurance In Governorates:

The health insurance organization is considered to be the second main source for public expenditures it covers approximately 60 % of the population, the average number of people with health insurance coverage in governorates is 62.7 %, South Sinai is fully covered by health insurance, while Luxor has the least insurance percentage of 52.4%.The total HIO expenditures is 3.8 billion; the average HIO expenditures in governorates is 142.3 million. The highest HIO expenditure was in Cairo 705.2 million, while the lowest expenditures was in New Valley 6.3 million.

Table 22: Health Insurance Coverage and Expenditure in Egypt Governorates

Region	Governorate	Insured Population %	HIO expenditure
urban governorates	Cairo	61.7	705,230,868.0
	Alexandria	79.0	434,068,910.0
	Port Said	75.8	80,323,044.0
	Suez	69.8	85,035,085.0
lower Egypt	Ismailia	67.0	52,908,751.0
	Damietta	61.5	48,367,712.0
	Dakahlia	52.8	190,743,453.0
	Sharkia	55.7	199,595,712.0
	Kalyubia	54.8	238,482,813.0
	Kafr El-Sheikh	54.3	118,687,321.0
	Gharbia	59.5	315,024,390.0
	Menoufia	57.5	147,059,305.0
	Behera	53.0	185,970,772.0
Upper Egypt	Giza	59.2	310,036,005.0
	Beni Suef	53.7	81,909,644.0
	Fayoum	52.7	81,822,149.0
	Menya	54.4	118,831,099.0
	Assuit	54.8	151,701,958.0
	Souhag	53.5	112,550,832.0
	Qena	54.8	52,428,819.0
	Luxor	52.4	32,564,927.0
	Aswan	65.3	56,021,647.0
frontier	Matroh	63.5	8,484,514.0
	New Valley	69.8	6,360,563.0
	Red Sea	92.7	8,833,416.0
	North Sinai	63.9	11,812,425.0
	South Sinai	100	7,479,019.0

D) Out of pocket expenditure on health

OOP considered the main source of financing healthcare in Egypt72% of total expenditure , Cairo has the higher OOP expenditure 5.1 billion LE while New Vally governorate has the lower OOP 55.3 million LE. The highest OOP per capita is in Kafr-Elsheikh 841.1 LE while the lowest value for OOP per capita is in Matrouh governorate 203.2

Table 23: OOP expenditure in governorates

Region	Governorate	OOP	OOP/ capita
urban governorates	Cairo	5,121,545,620.2	572.1
	Alexandria	3,392,947,134.7	736.6
	Port Said	384,695,906.5	600.0
	Suez	406,236,334.9	686.1
lower Egypt	Ismailia	629,425,659.0	567.3
	Damietta	782,447,383.5	614.4
	Dakahlia	4,047,172,300.3	710.6
	Sharkia	3,846,408,050.3	623.3
	Kalyubia	2,454,076,636.8	503.5
	Kafr El-Sheikh	2,537,342,210.8	841.1
	Gharbia	3,185,709,653.8	701.1
	Menoufia	2,242,081,829.6	597.5
	Behera	2,737,602,863.9	499.7
Upper Egypt	Giza	3,331,645,306.9	464.3
	Beni Suef	1,182,640,053.2	441.4
	Fayoum	1,456,449,547.2	489.3
	Menya	2,156,908,938.8	445.1
	Assuit	1,635,314,578.6	408.5
	Souhag	1,183,204,538.6	273.2
	Qena	895,237,878.4	311.4
	Luxor	358,869,526.9	329.4
	Aswan	448,292,330.1	330.6
Frontier	Matroh	82,534,324.3	203.3
	New Valley	55,316,272.2	258.6
	Red Sea	152,828,674.6	465.6
	North Sinai	258,328,012.0	632.6
	South Sinai	79,623,104.1	493.3
Total	Total	45044884670	

Source: CAPMAS, 2014.

From the previous analysis for health expenditure pattern in governorates, we can conclude the following:

The government health budget is not changed over years although the cost of healthcare is increasing rapidly, government spend more in Cairo and urban region while the IMR and is still high.

Moreover, the insurance coverage in south Sinai is 100 %, it has the highest governmental expenditure per capita 1248 LE which indicate that the beneficiaries utilize the government resources in addition to health insurance hospitals and clinics.

The analysis detects that the highest OOP/ capita was in Kafr el-Shiekh while the lower IMR and U5MR was also in the same governorate which reflect the relation between increasing health expenditure and improving health outcomes.

4.4: Examining the correlation between factors affects health outcomes:

Examining the correlation between factors affects health outcomes and the association between government health expenditure and selected health outcomes, this section is divided into 2 parts:

Part A: Correlation analysis

The study will analyze the relations between different variable affect and affected by heath expenditure pattern such as (Government health expenditure / capita, GDP/ capita, poverty % , N. of hospital beds / 10000, physician density / 10000, Urbanization %, Insurance coverage %, OOP/ capita, illiteracy, Unemployment) using Spearman Rank correlation coefficient and finds the followings:

1- Governmental expenditure per-capita

Governmental expenditure per-capita is positively correlated with GDP/capita, and the significance level is .009 which is highly significant, and that means Governmental expenditure per-capita increased in governorates with higher GDP. Governmental expenditure per-capita is negatively correlated with poverty, and the significance level is .007 which is highly significant, and that means governmental expenditure decreased in poor governorates

Governmental expenditure per-capita is positively correlated with number of hospital beds per 10000, and number of physician per 10000, the significance level is .000 , which is highly significant, and that means governmental expenditure per capita is high in governments with higher number of hospital beds and high number of physicians.

Governmental expenditure per-capita is positively correlated with the percentage of Urbanization in governorates, and the significance level is .000 which is highly significant, and that means Governmental expenditure per-capita is high in urban governorates

Governmental expenditure per-capita is positively correlated with percentage of insurance coverage, and the significance level is .000 which is highly significant and that means Governmental expenditure per-capita is increased in governorates with higher insurance coverage.

Governmental expenditure per-capita is negatively correlated with illiteracy rates, and the significance level is .000 which is highly significant and that means Governmental expenditure per-capita is decreased as illiteracy rates increased.

Governmental expenditure per-capita is not correlated with OOP/ capita and unemployment rate in governorates.

After analyzing the correlation between governmental expenditure and different social economic and health related factors we find the following:

Governmental budget allocated for health is not considering the economic or social needs of population because the governmental health expenditure was low in governorates suffer from higher poverty rate and lower GDP/ capita and high illiteracy rate. Moreover, governmental health expenditure was higher in urban governorates which contain higher number of hospitals and medical centers with high number of physicians and hospital beds

Even in governorates with higher insurance coverage, the Governmental expenditure per-capita is high which means the beneficiaries use the governmental hospitals and medical centers with HIO hospitals and clinics.

2- GDP per capita

GDP per capita is positively correlated with number of physician in governorates at significance level 0.02 which is highly significant, and that means poor governorates have lower number of physician and deficiency in health service provision. On other hand, GDP/ capita is not correlated with poverty rate, N. of hospital beds per 10000, urbanization %, insurance%, OOP/ capita.

3- Poverty rate :

Poverty rate is negatively correlated with N. of hospital beds per 10000, and number of physician per 10000, and the significance level are .006 and .000 which is highly significant, and that means poor governorates have lower number of hospital beds and physicians

Poverty rate is negatively correlated with percentage of insurance coverage and the OOP/capita , and the significance level are .012 and .000 which is highly significant and that means poor governorates have lower insurance coverage and OOP/ capita

Poverty rate is positively correlated with illiteracy rate in governorates the significance level is .000 which is highly significant, and that's means poor governorates have higher illiteracy rate.

Poverty is not correlated to urbanization percentage and unemployment rate in governorates

4- Number of hospital beds per10000

Number of hospital beds per10000 is positively correlated with physicians density per 10000 , urbanization %, insurance coverage percentage at significance level 0.000 which is highly significant, and that means urban governorates have higher number of hospitals and physicians and more people is covered by insurance

Number of hospital beds per10000 is negatively correlated with illiteracy rate in governorates at significance .000 which is highly significant, and that means governorates which suffer from illiteracy suffer also from lower medical care

Number of hospital beds per10000 is not correlated with OOP/ capita or unemployment rate

5- Physician density per 10000

Physician density per 10000 is positively correlated also with urbanization % insurance and oop/ capita at significance level 0.03,0.02, and 0.01, and that means governorates with higher urbanization percentage and have high insurance coverage and OOP per capita have higher number of physician and medical services.

Physician density per 10000 is negatively correlated with illiteracy rate at significance level 0.01 which is highly significant, and that means governorates which suffer more from illiteracy have lower number of physicians.

6- Insurance coverage percentage

Insurance coverage percentage is positively correlated to urbanization percentage in governorates and OOP per capita at significance level 0.02 and 0.01 and that means governorates with higher urbanization percentage and spend more on health from their pocket have higher percentage of insurance coverage.

Insurance coverage percentage is negatively correlated to illiteracy rate in governorates at significance level 0.000 which is highly significant at that means governorates with higher illiteracy rate have less insurance coverage because the number of employees and schoolchildren are low in those governorates.

7- OOP per capita is positively correlated with unemployment rate at significance level 0.04 at that means governorates that have higher unemployment rate spend more from their pockets on health.

8- Illiteracy is not correlated to unemployment rate in governorates.

Table 24: Correlations

			Gov. Health Exp. / Capita	GDP/ capita	Poverty %	N. of hospital beds per 10000	physicians density per	urbanization %	insurance	oop/ capita	illiteracy	Unemployment
Spearman's rho	Gov. Health Exp. / Capita	Correlation Coefficient	1.000									
		Sig. (2-tailed)	.									
		N	27									
	GDP/ capita	Correlation Coefficient	.493**	1.000								
		Sig. (2-tailed)	.009	.								
		N	27	27								
	Poverty %	Correlation Coefficient	-.508**	-.370	1.000							
		Sig. (2-tailed)	.007	.058	.							
		N	27	27	27							
	N. of hospital beds per 10000	Correlation Coefficient	.859**	.289	-.514**	1.000						
		Sig. (2-tailed)	.000	.144	.006	.						
		N	27	27	27	27						
	physicians density per 10000	Correlation Coefficient	.650**	.443*	-.700**	.639**	1.000					
		Sig. (2-tailed)	.000	.021	.000	.000	.					
		N	27	27	27	27	27					
	urbanization %	Correlation Coefficient	.755**	.182	-.365	.803**	.404*	1.000				
		Sig. (2-tailed)	.000	.363	.061	.000	.037	.				
		N	27	27	27	27	27	27				
	Insurance	Correlation Coefficient	.739**	.216	-.477*	.767**	.442*	.763**	1.000			
		Sig. (2-tailed)	.000	.280	.012	.000	.021	.000	.			
		N	27	27	27	27	27	27	27			
	oop/ capita	Correlation Coefficient	.231	.194	-.700**	.209	.478*	.208	.162	1.000		
		Sig. (2-tailed)	.247	.332	.000	.296	.012	.298	.420	.		
		N	27	27	27	27	27	27	27	27		

	Illiteracy	Correlation Coefficient	-.760**	-.245	.649**	-.755**	-.487*	-.783**	-.852**	-.353	1.000	
		Sig. (2-tailed)	.000	.217	.000	.000	.010	.000	.000	.071	.	
		N	27	27	27	27	27	27	27	27	27	
	Unemployment	Correlation Coefficient	.107	-.280	-.110	.264	-.013	.454*	.288	.382*	-.317	1.000
		Sig. (2-tailed)	.594	.157	.586	.183		.017	.145	.049	.108	.
		N	27	27	27	27	27	27	27	27	27	27
**. Correlation is significant at the 0.01 level (2-tailed).												
*. Correlation is significant at the 0.05 level (2-tailed).												

Source: Author calculation

Part B: Regression analysis to investigate the association between governmental health expenditure and health outcomes

IMR Regression Analysis

Dependent variable IMR for year 2014

Independent variables used in regression analysis:

- Governmental health expenditure per capita
- GDP/ Capita
- OOP/ capita
- Poverty rate
- Physician density per 10000
- Insurance coverage
- Urbanization percentage
- Illiteracy rate

The Regression Results:

These variables are responsible for 66% of factors affect IMR in Egypt, and the Anova significance is 0.004 and that indicate this model is highly significant, however governmental health expenditure per capita is highly significant factor but the result indicate that increasing health expenditure does not improve IMR. Therefore, health outcomes are not improved by increasing governmental health budget, and the governmental health budget should be reallocated and used in different ways, this result also point out there is inefficiency in using government resources.

Poverty is highly significant factor affecting IMR, and the regression results indicates increasing poverty by 1% leads to increasing IMR by .22 %, urbanization also is significant factor affects IMR.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.817[a]	.667	.519	2.9313

a. Predictors: (Constant), insurance, oop/ capita, GDP/ capita, physicians density per 10000, urbanization % , Poverty %, illiteracy, Gov. Health Exp. / Capita

Source: Author calculation

ANOVA[b]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	309.579	8	38.697	4.504	.004[a]
	Residual	154.668	18	8.593		
	Total	464.247	26			

a. Predictors: (Constant), insurance, oop/ capita, GDP/ capita, physicians density per 10000, urbanization % , Poverty %, illiteracy, Gov. Health Exp. / Capita

b. Dependent Variable: IMR

Source: Author calculation

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	2.467	10.852		.227	.823
	Gov. Health Exp. / Capita	.019	.006	1.028	3.363	.003
	GDP/ capita	-.001	.001	-.405	-1.869	.078
	oop/ capita	.016	.006	.591	2.640	.017
	Poverty %	.225	.082	.788	2.737	.014
	physicians density per 10000	-.058	.185	-.061	-.313	.758
	urbanization %	.079	.031	.539	2.529	.021
	Illiteracy	.183	.145	.383	1.256	.225
	Insurance	-.118	.097	-.341	-1.221	.238

a. Dependent Variable: IMR

Source: Author calculation

U5-MR regression analysis

Dependent variable: U5MR for year 2014

Independent variables analysis:

- Governmental health expenditure per capita
- GDP/ Capita
- OOP/ capita
- Poverty rate
- Physician density per 10000
- Insurance coverage
- Urbanization percentage
- Illiteracy rate

The Regression Results:

These variables are responsible for 65% of factors affect U5MR in Egypt, and the Anova significance is 0.006 and that indicates this model is highly significant, however governmental health expenditure per capita is highly significant factor but the result indicate that increasing health expenditure does not improve U5MR. Therefore, health outcomes are not improved by increasing governmental health budget, GDP/ capita is also is highly significant factor affects U5MR, as for Egyptian pound increase in GDP/Capita, U5MR decrease by .002. Moreover, Poverty is highly significant factor, and the regression results indicates increasing poverty by 1% leads to increasing IMR by .22 %, OOP/ capita and urbanization% also is significant factor affects U5MR.

From the previous analysis we can conclude the following:

Governmental health expenditure has high correlation with different factors such GDP/ capita, poverty rate, healthcare infrastructure, insurance coverage, urbanization %, illiteracy rate.

Health outcomes (IMR- U5MR) is highly associated with health expenditure pattern but the current expenditure pattern does not improve health outcomes, therefore, governmental health

budget should be reallocated and used in different ways, this result also point out there is inefficiency in using government resources.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.803[a]	.645	.487	3.4294

a. Predictors: (Constant), insurance, oop/ capita, GDP/ capita, physicians density per 10000, urbanization % , Poverty %, illiteracy, Gov. Health Exp. / Capita

Source: Author calculation

ANOVA[b]

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	384.134	8	48.017	4.083	.006[a]
	Residual	211.692	18	11.761		
	Total	595.827	26			

a. Predictors: (Constant), insurance, oop/ capita, GDP/ capita, physicians density per 10000, urbanization % , Poverty %, illiteracy, Gov. Health Exp. / Capita

b. Dependent Variable: U5MR

Source: Author calculation

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	5.147	12.696		.405	.690
	Gov. Health Exp. / Capita	.025	.007	1.167	3.699	.002
	GDP/ capita	-.002	.001	-.480	-2.145	.046
	oop/ capita	.015	.007	.505	2.186	.042
	Poverty %	.220	.096	.678	2.282	.035
	physicians density per 10000	-.116	.217	-.108	-.535	.599
	urbanization %	.077	.037	.464	2.106	.050
	Illiteracy	.277	.170	.514	1.630	.120
	Insurance	-.090	.113	-.229	-.796	.436

Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	T	Sig.
1	(Constant)	5.147	12.696		.405	.690
	Gov. Health Exp. / Capita	.025	.007	1.167	3.699	.002
	GDP/ capita	-.002	.001	-.480	-2.145	.046
	oop/ capita	.015	.007	.505	2.186	.042
	Poverty %	.220	.096	.678	2.282	.035
	physicians density per 10000	-.116	.217	-.108	-.535	.599
	urbanization %	.077	.037	.464	2.106	.050
	Illiteracy	.277	.170	.514	1.630	.120
	Insurance	-.090	.113	-.229	-.796	.436

a. Dependent Variable: U5MR

Source: Author calculation

Chapter 5 Conclusion and Recommendations

After evaluating Egypt demographics, health system and the government health expenditure pattern in Egypt governorates, we can conclude that inequalities are evident across many dimensions including social, economic and health outcomes. The health financing system in Egypt suffers from inefficiencies and inequalities that limit the effectiveness of government's effort to improve the health status of citizens.

The study not only advocates for increasing the percentage of health budget which is almost not changed over years , but also adopting allocation formula for public resources to solve the health inequity problem. Analysis results demonstrate that the government expenditure on health does not reach to the people who deserve financial support, as expenditure increased in rich governorates. Moreover, governorates with higher burden of disease and higher poverty rate spent less on health and have higher IMR and U5MR.

Universal health coverage is an essential solution to ensure health equality and equity, as all people should access and utilize quality health services. UHC is one of the main objectives of health pillar to achieve Egypt Sustainable Development Strategy 2030.

Poverty is the main factor which affects health outcomes and other living conditions, thus there should be a tailored health programs targeting the poor, special attention should be given to the Upper Egypt region, as it suffers more than other regions from social, economic and health disparities.

From the research analysis and results the study can answer the research question, the Egyptian government needs to changing the health expenditure pattern and adopting new budget

allocation methodology to ensure equitable allocation of resources and achieve health equity between governorates.

From the aforementioned analysis and conclusion, the study recommends the following:

There should be a clear understanding of health inequities problem in Egypt between governorates and regions, at the same time, health equity should be introduced as an important target when restructuring the health system.

The government should restructure the national health policies and revisit the Sustainable Development Strategy 2030 to guarantee improving all living conditions, ensure sufficient and sustainable health finances, and secure equitable distribution of resources which are fundamental to achieve health equity, social justice and sustainable development. In addition, the government should give more attention to underserved areas and the remote rural areas by promoting accessibility of health services to vulnerable groups, providing targeted action plans that tackle health determinants such as education, poverty.

Ministry of Health and Population should promote the equitable allocation of resources especially of financial and human resources to reach all groups of the community; it should adopt a resource allocation formula to ensure the equitable allocation of resources between governorates and regions. MoHP should advocate for adequate allocation of resources programs at the decentralized level by strengthening the legal and institutional frameworks for decentralized resource allocation and formalizing the budgetary process and resource allocation procedures.

Strategic Planning Sector in MoHP should apply the resource allocation formula when preparing strategic plans and the annual investment plan. Furthermore, the resource allocation

formula needs to be updated to capture the changes in the applied variables. Additionally, the sector should ensure that the resources are spent appropriately on disadvantaged groups and the necessary interventions, new department for monitoring health disparities can be created in MoHP to coordinate between different sectors and evaluate efforts to reduce health disparities.

The allocation formula can include differently weighted, need-based factors, those factors and weights are selected on the basis of their importance in determining the quality of healthcare provided to the Egyptians, such as:

- Number of population in each governorate
- Percentage of people living below the basic poverty line
- Percentage of rural and remote areas %
- Number of hospitals and medical center
- Under-five-mortality rate

These factors are supposed to be included in the formula with different effect on calculation, some factors are positively affect such as number of population, poverty rate, burden of diseases, another factors affect negatively such as urbanization percentage and number of hospitals and clinics in each governorate.

All the above mentioned factors are important to be considered when allocating budgets or setting the annual budget plan because number of population is varying from region to another; some governorates are more crowded than others, poverty is also important factor because it is correlated with other underlying health determinants such as low education or bad housing, percentage of rural areas is important as well because rural population often lives in hard-to-reach areas due to underdeveloped road infrastructure, finally U5MR can be included as a measurement for burden of disease.

Health outcomes can be improved by enhancing the living condition of population, economic status and education. Therefore, tailored awareness program should target the governorate which have higher burden of IMR and U5MR.

There are still many unanswered questions can be tackled in future studies

- How much the government can afford to provide better health services to all population?
- What is the best way to allocate the limited resources?
- How can the government document the gap between available resources and those required to provide quality health services to all population?
- How much is paying for providing health services and who is benefiting from services provided?

The study recommends excluding the frontiers governorates from future similar analysis because it has small population size which may affect the stability of the model and the results of investigation.

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