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The American University in Cairo
School of Global Affairs and Public Policy (GAPP)

**The Association between Health Financing and Maternal
and Child Health in Middle East and North Africa
Countries**

Thesis Submitted to

Department of Public Policy and Administration

In partial fulfillment of the requirements for the degree of

Master of Public Policy and Administration

By

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MA, M.B.B.ch

Under the supervision of

Dr. Ghada Barsoum

2014

ABSTRACT

The Association between Health Financing and Maternal and Child Health in Middle East and North Africa Countries

Ahmed Abdelgawad

Improving maternal and child health outcomes for women and children is a critical step to achieve the MDGs; however it requires sufficient funding to implement proven quality interventions. The aim of the study is to investigate the relationship between the different health care financing options cross the Middle East and North Africa “MENA” countries and the maternal and child health outcomes. Our main argument is that: Can different health care financing strategies affect Maternal, Neonatal and Child health? If yes, How?. This study is based on a cross sectional analysis of twenty one states from MENA region between 2009 and 2013 exploring the three dimensions of the maternal and child health outcomes namely a) Infant mortality b) Maternal mortality and c) Child health. Correlation between financial and maternal and child health indicators as well as linear regressions was carried out to investigate the relationships between the maternal and child health indicators and health spending consequently health system financing strategy. The findings of this study indicate that more spending on health is highly associated with positive maternal and child health outcomes namely reduction in infant and child mortality. Our results also indicate that the improvements in government effectiveness in regards to government health spending is accompanied with higher maternal and child health outcomes. Thus, increasing government expenditures is likely to lead to better improvements of health outcomes if it is accompanied by the right policies and institutions, which was the case of the first group of countries in MENA region.

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Ahmed Tammam

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List of Acronyms

CSDH	Commission on Social Determinants of Health
DHS	Demographic and Health Surveys
DSF	Demand Side Financing
EMRO	Eastern Mediterranean Regional Office
GBV	Gender Based Violence
GDP	Gross domestic product
GFHs	Gulf Family Health Surveys
GT	General Taxation
MCH	Maternal and Child Health
MENA	Middle East and North Africa
MDGs	Millennium Development Goals
NHA	National Health Accounts
OOP	Out Of Pocket
PAP Child	Pan Arab Project for Child Development
PAPFAM	Pan Arab Project for Family Health
PPP	Purchasing Power Parity
RTIs	Reproductive Tract Infections
SHI	Social Health Insurance
STIs	Sexually Transmitted Infections
UNDP	United Nation Development Program
WHO	World Health Organization

Introduction

The health for the person is one of the most important treasures for his life. There is always a debate on health care services provided for people in developing countries in terms of the quality and affordability.

Improving maternal and child health outcomes for women and children is critical step to achieve the MDGs; however it requires sufficient funding, policies to implement quality interventions that can support the process from pre-pregnancy to the delivery even after delivery during the postnatal care period as well as the childhood to the adulthood by scaling those interventions on wider scales. The access to and utilization of health services are considered one of the main challenges towards a quality health care systems of the MENA region, however it is clear that many Arab countries have witnessed marked improvements in the health status of their population over the past few decades, as evidenced by economic, social and health indicators. *(UNDP 2012)*

Within the framework of WHO definition of health as a state of complete physical, mental and social well-being, and not merely the absence of disease or infirmity, the reproductive health addresses the reproductive processes, functions and system at all stages of life. Reproductive health, therefore, implies that people are able to have a responsible, satisfying and safe sexual life and that they have the capability to reproduce and the freedom to decide if, when and how often to do so. Implicit in this are the right of men and women to be informed of and to have access to safe, effective, affordable and acceptable methods of fertility regulation of their choice, and the right of access to appropriate health care services that enable women to go safely through the whole process from the pregnancy till delivery with best outcomes for the couple and the infant *(WHO 2007)*.

Improving maternal and child health outcomes which includes maternal, child and neonatal indicators is critical step to achieve the MDGs. However it requires sufficient funding to finance the health system to implement proven quality interventions that span the continuum of care from pre-pregnancy to delivery, the postnatal period, and childhood additionally scaling those interventions on wider scales. This framework pointed the relationship between the RH outcomes and the spending strategy. The external environment for this relationship emphasis that the access to and utilization of health services are considered one of the main challenges concerns to the health care systems.

The aim of the study is to investigate the relationship between the different health care financing options cross the Middle East and North Africa “MENA” countries and the maternal and child health outcomes among those countries.

The overwhelming majority of the cross-country studies (especially studies of developing countries) use cross-sectional datasets to explore this question of effectiveness of health spending. So our research question start with the frame work of “Spending on health care services matter in achieving better health outcomes” However, our understanding of this issue would benefit greatly from using a dataset for MENA region and adequately controlling for country specific effects, which has rarely been done in the literature due to the unavailability of panel data.

So the author conducted a cross sectional analysis of 21 states from MENA region which are countries of the Eastern Mediterranean Region of the WHO during the last five years 2009 to 2013 exploring the three dimensions of the maternal and child health outcomes namely a) Infant mortality b) Maternal mortality and c) Child health. Our unified source of data was the WHO

Eastern Mediterranean Region Countries statistics summaries sheets which include all data needed available for each country from 2009 till 2013.

In 2012 the countries of the Region were categorized into three groups based on their health financing system. We used the WHO grouping system for countries of the Eastern Mediterranean region which is supported by the World Bank classification of MENA countries into low, lower middle, upper middle and high income levels. Control variables include data out of the following maternal and child health outcomes “total fertility rate, contraceptive prevalence, maternal mortality ratio, antenatal care coverage, births attended by skilled health personnel, availability of basic essential obstetric care and availability of comprehensive essential obstetric care, perinatal mortality rate, prevalence of low birth weight, prevalence of positive syphilis serology in pregnant women, prevalence of anemia in women, reported prevalence of women with genital mutilation, prevalence of infertility.

The methodology relies on correlation and linear regressions to identify the crude relationships between each independent variable and spending.

Health care in MEAN region .. Challenges and opportunities

Over the last decades there are many concerns related to health equity and social determinants of health. Those concerns pushed the policy makers to think of factors that can help in drafting policies and actions that tackle the health structural and social determinants. (*Shah et al., 2007*)

There is a huge attention given to the area of maternal health research, to examine the socioeconomic maternal health inequities and disparities. So numerous studies in the international literature have investigated various dimensions of maternal health inequities and confirmed that there is a strong relationship between women's socioeconomic status and their maternal health indicators, in which low socioeconomic status is significantly associated with low maternal health status (*Ibid*).

The examination of the inequity of the socioeconomic maternal health and its disparities has received significant attention among researchers, there are many studies that investigated the different dimension of those inequities by women's socioeconomic indicators. For that purpose, the WHO and World Bank recommended two indicators for tracking the level of financial risk protection in health which are the incidence of catastrophic health expenditure and the incidence of impoverishment due to out-of-pocket health payments (*WHO 2007*).

Within the context of Arab countries, disparities in maternal health have been points of concern among researchers for a long time. These concerns were implicitly elaborated in the conventional tabulation of disparities in maternal health indicators by socioeconomic status in reports of large surveys such as Demographic and Health Surveys. Despite major improvements that have occurred over the past 3 decades, several subsets of the population in most countries continue to face difficulties utilizing the range of health services available (*Ibid*).

MENA region

The Middle East and North Africa (MENA) region of the world, includes Algeria, Bahrain, Djibouti, Egypt, Iran, Iraq, Jordan, Kuwait, Lebanon, Libya, Morocco, Oman, Qatar, Saudi Arabia, Syria, Tunisia, United Arab Emirates (UAE), Palestine, Somalia, Sudan and Yemen, consists of mostly lower-middle-income range countries in terms of gross national product per capita (GNP/c) but also includes the high income Gulf states at one extreme (e.g., the U.A.E.) and Yemen, one of the lowest-income countries in the world (*UNAIDS 2011*).

The variation in health and other social indicators among countries in the region which based on level of economic and social development are comparable to other countries of similar levels of economic development (*Aoyama, 2001*). Further, there are significant implications on reproductive health given local traditions in the MENA region, which are not inextricably related to religion, on health, nutrition, education, and other social sectors there. The epidemiologic transition is taking place in most of MENA countries with an increased incidence of non-communicable diseases, which has financial implications on the health care systems in each country since treatment of these diseases is more costly (*Ibid*).

Interestingly one fifth of the population in the MENA region is aged 15-24, which is normally the age of sexual initiation, characterizing a massive youth bulge in the region (*Abu-Raddad, et al., 2010*). Complex emergencies such as wars and conflicts can increase HIV vulnerability by decreasing access to prevention services, collapsing health infrastructure, disrupt social support networks and increase exposure to sexual violence as well as increase migration to higher HIV prevalence areas are prevalent in the region. Moreover, the MENA region has extensive levels of migration, displacement and mobility, and is home to the largest number of refugees and internally displaced persons in the world (*Ibid*).

Our work was conducted to find evidence or counterevidence for our theoretical assumptions as regard to the maternal, neonatal and child health outcomes and its relation to the different health care financing options in 21 states in the MENA region.

MENA countries differ greatly in income level, so the validity of comparison can be a question. So the author used the WHO grouping system for countries based on population health outcomes, health system performance and the level of health expenditure into three groups in the Eastern Mediterranean region which is supported by the World Bank classification of MENA countries into low, lower middle, upper middle and high income levels. In this respect a total sample is better since it will allow comparison within each group(*WHO 2012*). We explored and analyzed the data of 21 countries of those classified states between 2009 and 2013 which enabled us to draw some conclusions and answer the research question.

- Group 1 comprises countries where socioeconomic development has progressed considerably over the past decades, supported by high income (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates);
- Group 2 comprises largely middle-income countries which have developed extensive public health service delivery infrastructure but face resource constraints (Egypt, Islamic Republic of Iran, Iraq, Jordan, Lebanon, Libya, Morocco, occupied Palestinian territory, Syrian Arab Republic and Tunisia);
- Group 3 comprises countries which face major constraints in improving population health outcomes as a result of lack of resources for health, political instability, and other complex development challenges (Djibouti, Somalia, South Sudan, Sudan and Yemen) (*Ibid*).

General Health

The concerns for health equity and social determinants of health have contributed to the creation of evidence-based research that directs policy-makers' attention to the significance of health inequities and promotes policies and actions to tackle their structural and social determinants(*WHO 2010*).

In the area of maternal health research, examination of socioeconomic maternal health inequities and disparities has received significant attention among researchers and numerous studies in the international literature have investigated various dimensions of maternal health inequities by women's socioeconomic indicators. These studies have repeatedly confirmed the strong association between women's socioeconomic status and their maternal health indicators, in which low socioeconomic status is significantly associated with low maternal health status and underutilization of maternal health care services (*Ibid*).

The notion of health as a human right started to take root in the region, following trends that were being developed in Europe. Following the example of Great Britain, Arab countries that had been former British colonies principally Egypt, Iraq, Sudan and Jordan adopted the model of provision of medical services by the public sector financed by their treasuries (*Kronfol NM, 2012*).

In 1964, Lebanon adopted the National Social Security Fund, demonstrating the commitment of the State to provide end-of-service entitlements, family support and medical coverage in a spirit of social solidarity between employers, employees and the State. The Maghreb countries Tunisia, Morocco, Algeria, and Mauritania provided services mainly through the public sector. Tunisia adopted a sweeping social policy, espoused by the State that ensured education and health for all, with support for the role of women. The Gulf countries namely

Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and United Arab Emirates (UAE) adopted a public sector welfare system financed by oil revenues. These countries had the advantage of starting fresh after they gained independence, since health systems prior to independence had been rudimentary at best (*ibid*).

Health system and reform

Health systems have been defined in many different ways (*Atun and Menabde, 2008; Shakarishvili et al., 2010*). *Roemer (1991)* defined health systems as the combination of resources, organization, financing and management that culminates in the delivery of health services to the population. *Hurst (1991)*, in his definition of health systems, he focused on financial flows and payment methods between population groups and institutions. *Hsiao (2003)* proposed to conceptualize a health system as “...a set of relationships in which the structural components (means) and their interactions are associated and connected to the goals the system desires to achieve (ends).” He limited the boundaries of a health system to the “components” that “...can be utilized as policy instruments to alter the outcomes.”

(*The World Health Report 2000*) described health systems as all the activities whose primary purpose is to promote, restore or maintain health. This definition is the widely used one now.

Universal health coverage is the basis of the WHO Twelfth General Programme of Work 2014–2019 which includes five categories of work that collectively contribute to the achievement of universal health coverage: 1) Communicable diseases; 2) Non-communicable diseases; 3) Health through the life course which embraces maternal and child health and healthy ageing; 4) Health system development; and 5) Emergency preparedness. WHO emphasizes the fundamental importance of fair financing and financial risk protection to the achievement of universal health coverage with focus on the maternal and child health (*WHO 2013*).

The WHO framework (WHO, 2007) defines the health system in terms of the following six discrete “building blocks”: (i) Service delivery; (ii) Health workforce; (iii) Information; (iv) Medical products and technologies; (v) Financing; and (vi) Leadership and governance, corresponding to the main functions already defined in the World Health Report 2000 (*WHO, 2000*), these building blocks were intended to allow a definition of the desirable attributes of a health system and help define WHO priorities and gaps (*WHO, 2007*).

Health financing

The adoption or scaling up of demand-side financing (DSF) is actively considered as a way of improve access to health services in many developing countries of the world (*Anwar et al., 2008; Behrman & James, 1998; Bhatia & Gorter, 2007; Bhatia, Yesudian, & Gorter, 2006*). The common approach for expanding access to health services has been to invest in supply increasing interventions such as services geographic coverage as well as the quality of service delivered in terms of trained staff, equipment, supplies, medications, etc. By the early 1990s, it became clear that supply-side policies alone will not sufficiently address the low service utilization concerns related to the inequality (*Bhatia & Gorter, 2007; Bhatia et al., 2006; Ensor & Cooper 2004; Koblinsky et al., 2006; Thaddeus & Maine 1994*).

Most of the public health care programs in the Arab countries provide comprehensive coverage of preventive, ambulatory and in-patient services. These services are normally either completely free of charge or received at a nominal fee. Despite differences in health system size, structure and financing, evidence suggests that across the region particular poor population and marginalized groups are affected by barriers to accessing health care disproportionately to rich population (*Ensor T, 2004*).

The access to maternal health services is still low, especially for poor and marginalized groups, despite the capacity expansion of healthcare facilities. This may be due to the relatively high out-of pocket “OOP” expenses in both the public and private sectors which is not affordable by poor people (*Bonu, Bhushan, Rani, & Anderson, 2009; Borghi, Sabina, Blum, Hoque, & Ronsmans, 2006, Borghi, Ensor, Somanathan, Lissner, & Mills, 2006; Dhar et al., 2009*).

Despite major improvements and efforts exerted to improve the health care access over the past 3 decades, there are still many subsets of the population in most countries continue to face difficulties utilizing the range of health services available. It is feared that these difficulties may increase with the current trend towards a greater degree of cost-sharing and co-payment for health care. As per the global health expenditure, this region spent approximately US\$ 125 billion on health in 2011. This figure constitutes 1.8% of the total world health spending for around 8.7% of the world population. Almost 40% of health expenditure is being spent out-of-pocket (*Global Health Expenditure database, 2013*).

The funding of health care is different from health care spending because it focuses on how to allocate revenues to the different expenditures of the health care sectors (*Santerre & Neun 2000*).

Based on the healthcare financing analysis, Le defined public financing of health care as “financing via taxes and compulsory health insurance premiums” (*Le 1987*). Out-of-pocket payments are defined as health expenditures paid directly by individuals consisting of co-payments, co-insurance, deductibles, and spending on self-medications (*Calikoglu 2009*). The private funding of health care is often negatively impacted the utilization of health care facilities and services. The out-of-pocket expenditures are not only related to the absolute amount of cost-sharing, it also represent a cash flow challenge since payments are often up front. In some cases, the overall caps on maximum cost-sharing are too high to effectively protect vulnerable groups (*Kronfol NM, 2012*).

Financing methods for the health care services has different sources, it includes general taxation, social insurance, private insurance, donor funding, community financing and direct out-of-pocket payments by patients. The profile of the health financing for a person is the mix of

different financing methods that determine who will bear the financial burden. Also it affected the decision of whether or not this person will utilize such health care service. So the way of allocation of the available funds for health finance is affecting individuals access to health care facilities and has an implication on both access and equity, so funds need to be allocated efficiently on different levels, geographically and also within the health care sector itself. (*WHO, 2013*).

Away to improve such situation related to the maternal health services utilization consequently achieving the Millennium Development Goal (MDG) for maternal health, the focus has shifted to reducing financial barriers that prevent people from access to such facilities (*Bhatia et al., 2006*).

For achieving such purpose, there are two schemes to finance health care: General Taxation (GT) and Social Health Insurance (SHI). Under GT, the government provides the population with free health care or at a very low price. On the other hand, low and middle income countries have limited ability to raise sufficient funding from taxes to meet all health financial requirements due to the high rates of poverty and to the large size of informal economy, thus they can't provide a functioning system (*Witter et al., 2009*).

WHO suggested that there is no one best prepayment mechanism that fits all countries in terms of raising funds or protecting households from financial catastrophe resulting from health shocks (*WHO, 2005*). Countries are at different situations and are facing different kinds of challenges related to the health system strengthening and so they need to have clear decision on methods of funds allocation for financing the health system and how to meet the need given their social structure, economic challenges and political contexts, so there is no single ideal way for

financing the health care, however reducing the OOP portion is a key to reduce the financial catastrophe resulting from illness (*Ke Xu et al., 2007*).

There was a study conducted by Xu *et al.* that explored the determinants of catastrophic health expenditure in 59 countries. The conclusion was that the governmental proportion as opposed to the OOP share of total health spending is the main factor explaining the prevalence of catastrophic health expenditure across the countries (*Ke Xu et al., 2003*).

In Egypt the OOP became the principle mean of financing health care in Egypt. According to the National Health Accounts, in 2008, OOP accounted for 60% of health spending however public finance represented only 33.5%. The remainder is funded by donors, public firms and employer funds (*Ministry of Health, Egypt, and Health Systems 20/20, 2010*). So depending on the OOP in financing health care leaves households exposed to risk of financial failure if any of the household members become sick. Therefore, health shocks can push households into financial catastrophe resulting from health payments and lost earnings due to inability to work (*Ke Xu et al., 2003*).

WHO and the world bank recommended two indicators to track the financial risk protection level in health, those two indicators are the incidence of impoverishment due to out of pocket payment and the incidence of catastrophic health expenditure. The later shows the number of individuals of all income levels who suffer financial hardship (spending more than 40% of their disposable income),. While the former captures the fact that relatively small payments can have severe financial consequences as well, particularly for people already close to the poverty line (*WHO 2007*).

In the absence of these two indicators, the share of out-of-pocket spending which are payments called direct payments made by individuals and households at the point of receiving

health services and which are not reimbursed by a third-party can be used as a proxy. Decreasing the OOP share is the aim of well-functioning inclusive health care system and support the universal to health care services. Evidence suggests that where the share of out-of-pocket payments is higher than 20% of total health expenditure, households encounter an increased risk of financial catastrophe and impoverishment, which undermines the timely demand and use of needed care (*The world health report 2010*).

In respect of financial risk protection, the share of out-of-pocket payment from total health spending has been stable over the last decade but each group of countries has demonstrated diverse trends. In Group 1 countries it decreased from 21% to 17%; in Group 2, it fluctuated around 50%; and in Group 3, it increased from 59% to 69% (*ibid*).

The scarcity of resources in this century is a huge challenge for all health care receivers particularly mothers who really in need for those services and who may be prevented for access due to financial barrier, geographical barrier and other barriers . During childbirth, for example, attendants with the skills to respond to complications are present at only half of deliveries worldwide (*Ibid*).

The National Health Accounts (NHA) is a framework that measures total public, private, and donor national health expenditures. This tool is formed in a standard set of tables. It provides useful information to aid in understanding the health care financing system.

Given the importance of consistency in the methods used to measure national health accounts (*The World Bank, 2003*), for the comparison and analysis of national health expenditure “Public spending on health/ Out of pocket payments / financial catastrophe” along with the “Maternal, Neonatal and Child health outcomes” cross the three categories of MENA region countries. Data was selected from a single source (Countries statistics summaries sheets

of the WHO regional office) to ensure that comparisons is based on the same estimation and data collection methods; using the most recent data for the last five years.

Maternal and child health outcomes

Reproductive health and rights were established as one of the cores for the human rights and development during the UN International Conference on Population and Development (ICPD) in Cairo in 1994 also fostered during the World Conference on Women in 1995 in Beijing (*Aoyama, 2001*).

The ICPD promoted the concept of the sexual and reproductive health and rights “SRHR” (*Aoyama, 2001; Zurayk, 2001*). The Non-Governmental Organizations (NGOs) attended this conference agreed to a 20-year programme of action to promote sexual and reproductive health as well as promote the reproductive rights and stabilize the world’s population. ICPD displayed the importance of the linkages between population, health, poverty, education, patterns of production and consumption, and the environment (*Glasier, Gulmezoglu, Schmid, Moreno, & Van Look, 2006*).

The ICPD Programme of Action proposed a definition of reproductive health as a complete state of physical, mental and social well-being with relation to the reproductive system as well as its functions and processes instead of just an absence of disease or infirmity (*Aoyama, 2001*).

According to the WHO, Sexual health refers to a complete state of physical, mental, and social wellbeing related to sexuality requiring a beneficial and respectful approach to sexuality and sexual relationships including the option to have safe and pleasurable sexual experiences devoid of coercion, discrimination and violence (*WHO, 2012*).

On the other hand, ICPD definition of reproductive health included sexual health, however, the value of sexual health as a separate issue in public health emerged for various reasons not limited to but including the HIV pandemic, increasing global rates of sexually transmitted infections (STIs) and increasing awareness of the public health significance of problems such as gender-based violence (GBV). These public health topics are also concerned with enabling safe and satisfying sexual relationships for people of all ages, including adolescents and those beyond the reproductive years, free of gender discrimination, disparate access to health services, restrictive laws, sexual coercion and exploitation and GBV (*Glasier et al., 2006*).

In order to achieve the best outcomes in the area of maternal and child health, promote the sense of well-being and control over one's life and ability to enjoy his sexual and reproductive health rights, consequently reducing child mortality improving maternal health, and combating HIV/AIDS which are three goals of the MDGs, all of those are directly linked to the access to such services (*Fathalla & Rashad, 2006*).

So as the SRHR is linked directly to three of the MDGs, so it is considered as essential for the achievement of all MDGs (*Glasier et al., 2006*). Reproductive rights were defined during the 1994 ICPD as human rights based on the basic right of all couples and individuals to choose the number, spacing and timing of children and the resources to do this, as well as to attain the highest standard of reproductive and sexual health (*Aoyama, 2001*).

Sexual rights also include the right of all individuals to seek, receive and deliver information related to SRHR, and give the ability to decide whether or not to be sexually active, have consensual sexual relations and marriage, and pursue a satisfying, safe and pleasurable sexual life (*Glasier et al., 2006*).

SRH also includes activities like family planning; prenatal care; safe delivery of babies; postnatal care and management of complications during pregnancy and delivery; prevention and management of complications related to abortion; diagnosis and treatment of reproductive tract infections (RTIs) and STIs including provision of HIV/AIDS; information, education and counseling; and discouragement of harmful practices such as female genital cutting (FGC) and gender-based violence (GBV) (*Aoyama, 2001*) as well as promotion of healthy sexuality (*Glasier et al., 2006*).

Attention to maternal and child health has recently become recognized more broadly as a means to achieve objectives of social and economic development and stability in addition to positive health outcomes for women and children (*Aoyama, 2001*). Complications related to STIs and RTIs include infertility or even death in the case of HIV/AIDS (*Ibid*) which can affect productivity and quality of life.

Improving the maternal and child health outcomes for both women and their children requires resources which consequently requires sufficient funding to implement proven quality interventions that span the continuum of care from pre-pregnancy to delivery, the postnatal period, and childhood. Access to health care services and utilization of such services remain serious concern to the health care systems of the Arab countries. It is also important to highlight that over the past few decades, Arab countries have witnessed marked improvements in the health status of their population, as evidenced by economic, social and health indicators. (*UNDP 2012*)

With the presence of these large maternal health inequities, many researchers argued that the achievement of Goal 5 of the Millennium Development Goals which is the reduction of the maternal mortality and improve maternal health can only be materialized in some countries

through maternal health policies that would stand beside the poor people and enhance the access and utilization of maternal health care services by marginalized and vulnerable women(*Ibid*). Within the context of Arab countries, disparities in maternal health have been a point of concern, part of those concerns are related to the disparities in the maternal health indicators by socioeconomic status in reports of large surveys such as Demographic and Health Surveys (DHS), Pan Arab Project for Child Development (PAPCHILD), Pan Arab Project for Family Health (PAPFAM), and Gulf Family Health Surveys (GFHS), additionally other research studies and reports related to the maternal health disparities (*Khader 2009*).

On the other hand, women's education was found to be the second best predictor of prenatal care and hospital delivery in both Tunisia and Morocco. In Tunisia, women with some education were 40% more likely to receive prenatal care and 46% more likely to deliver in a hospital compared to women with no education, while in Morocco, the effect of women's education was stronger as educated women were 68% more likely to receive prenatal care and 76% more likely to deliver at a hospital than women with no education(*Ibid*).

Women with high educational attainment and high standard of living were 50% more likely to receive antenatal care and deliver in a hospital than uneducated women and those with low standard of living. In Oman, education was strongly related to women's use of contraceptives. Women with university education were found to be almost four times more likely to use contraceptives compared to uneducated women. Fertility was found to be lower among young Palestinian women (15-24 years) with secondary education or more when compared to other women with less education in Gaza, the West Bank, Jordan and Lebanon. In reviewing hospital-based caesarean sections in the Arab region and Egypt, recent studies unveiled a general

positive association between education and Caesarean section. Educated women were found more likely to undergo this surgery than less educated women (*Ibid*).

However, although almost all the earlier literature has succeeded in highlighting the significant inequities in maternal health indicators. Recently, more international comparative studies exploring the maternal health equities in the Arab countries has been conducted. One of those studies conducted on 45 developing countries including some Arab countries, the study shows that Egypt, Morocco and Yemen were among the countries in which significant inequities by wealth quintiles denoted in some indicators mainly the attendant of birth by birth professional attendant also birth for which two or more antenatal visits were conducted (*Ibid*).

According to the WHO, there are three features of maternal health care mean in which general, insurance, or at least pre-payment, is preferred to direct user payments. Firstly, medical services for women during pregnancy are usually essential with potentially life-threatening implications if not obtained. Secondly, maternal care can often be expensive, absorbing a substantial fraction of a household's disposable income which affects the total family finance and income. Finally, while basic delivery care is required for all women, care during complications is uncertain making it difficult for households to plan for the financial consequences. Relying on direct payment alone can mean that paying for health services can have catastrophic implications for the household economy. These are the key features that led WHO to make fairness of financing contributions based on increased pooling one of the three pillars of a successful health system (*WHO 2010*).

Literature review

The notion of health as a human right started to take root in the region, following trends that were being developed in Europe. Following the example of Great Britain, Arab countries that had been former British colonies principally Egypt, Iraq, Sudan and Jordan adopted the model of provision of medical services by the public sector financed by their treasuries (***Kronfol NM, 2012***).

In 1964, Lebanon adopted the National Social Security Fund, demonstrating the commitment of the State to provide end-of-service entitlements, family support and medical coverage in a spirit of social solidarity between employers, employees and the State. The Maghreb countries Tunisia, Morocco, Algeria, and Mauritania provided services mainly through the public sector. Tunisia adopted a sweeping social policy, espoused by the State that ensured education and health for all, with support for the role of women. The Gulf countries Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and United Arab Emirates (UAE) adopted a public sector welfare system financed by oil revenues. These countries had the advantage of starting fresh after they gained independence, since health systems prior to independence had been rudimentary at best. (*ibid*)

Previous studies show that the poor are significantly less healthy than the rich (***Wagstaff, 2000 and Gwatkin, 2000***) and that the rich are more likely to obtain medical care when sick (***Makinen et. al., 2000***). Hence, it is the level of health care financing that can bridge the gap between the health status of the poor and the rich. For example, (***Anand and Ravallion, 1993***) using cross-sectional data for 22 developing countries in 1985 find that health expenditure raises life expectancy.

In a study on Philippines, the (*The World Bank 1995*) reported that public expenditure on health in the Philippines contributed to the reduction in infant mortality rates in the poorer regions, but not in the richer regions.

In their study involving 50 developing countries, (*Gupta, et al., 1999*) found empirical evidence to support the claim that greater public spending decreased infant and child mortality rates. In a further study by these authors (*Gupta et al., 2001*) relating to public spending on health care for a larger sample (70 developing countries), the authors find some evidence that health expenditure reduces childhood mortality.

(*Hojman's, 1996*) study involving Central American and Caribbean countries revealed that public health spending has a statistically significant effect on health status.

There are studies that do not find any support or statistically insignificant support for health expenditure reducing mortality rates. *Le Grand (1987)* found weak and a negative correlation between health inequality and share of public spending in health care. *Filmer, Hammer and Pritchett (1998)* attempted to address the issue of allocations within the health sector by including a measure of government spending on primary health care in their cross- section analysis of the causal factors of infant mortality and fail to find a statistically significant impact of primary health care spending on infant mortality rates.

Filmer and Pritchett's (1999) further study on government health expenditure on infant and under five mortality rates in 98 developing countries reveal statistically insignificant effect.

Deolalikar (2005) using a state panel for 1980-99 for India found no effect of current health expenditure on mortality rates.

The question “does spending on health care services matter in achieving better health outcomes?” has received much attention in the literature. This question has been asked in both

developed and developing country contexts. It has been analyzed at the aggregate country level using cross-country datasets (*Pritchett and Summers 1996; Filmer et al. 1998; Filmer and Pritchett 1999; Rutstein 2000; Shi 2000*), at the regional level within one country (*Dreze and Murthi 1999*), and at the household level using DHS and fertility surveys (*Hughes and Dunleavy 2000*). Finally, this issue has been analyzed using a wide range of measures to capture health outcomes ranging from maternal and child mortality to cancer deaths.

However, the empirical evidence on this topic is mixed. Some early evidence generated using developed country level data showed that spending on health care services was not associated with noticeable improvements in health outcomes leading to the notion that health care services play more of a “caring” rather than “curing” role in developed countries. “Countries that spend more may well buy more caring, but little additional curing” (*Newhouse 1977, p. 122*)

Anderson and Poullier (1999) found that while from 1990 to 1997 US health spending per capita increased 4.3% per year, compared with the OECD median of 3.8%, the US was generally in the bottom half according to available measures and its relative place has been declining since 1960 (*Anderson and Poullier 1999; Anderson and Hussey 2001*).

Fisher et al. (2003) using US Medicare data found that patients’ health status was similar across five regions with different spending levels, but those who lived in high-spending regions utilized more health care services. They also found “no evidence of lower death rates, better functional status, or consistently better satisfaction with care for patients in the high-spending regions” (*Fisher et al. 2003*)

On the other hand, there are studies showing a positive effect for health spending on health outcomes in developed countries. The study by *Cremieux et al. (1999)* using province level data showed that health care spending does matter. *Cremieux et al. (1999)* examined the

relationship between health care spending and health outcomes using province level Canadian data and found evidence that lower health care spending was associated with a statistically significant increase in infant mortality and a decrease in life expectancy in Canada controlling for economic, socio-demographic, nutritional and lifestyle factors, time trends and province level factors. More specifically they found that a 10% reduction in health care spending was associated with infant mortality rates higher by 0.5% among males and 0.4% among females and life expectancies lower by 6 months for men and 3 months for women (*Cremieux et al. 1999*).

Martin et al. (2008) used programme budgeting data from 295 English Primary Care Trusts to examine the link between health spending and health outcomes (cancer and circulatory diseases). The study estimated a health expenditure equation and a health outcomes equation using instrumental variables. The authors found a negative effect of health spending on cancer and circulatory disease deaths (*Martin et al. 2008*).

Empirical literature on the link between health spending and health outcomes using datasets that include developing countries' data is also inconclusive. However, the general view in the literature based on the majority of previous studies indicates that health spending either plays a minor or insignificant role in improving health outcomes.

Musgrove (1996) found no evidence that public spending on health has any impact on child mortality, which was strongly associated with income per capita instead.

Zakir and Wunnava (1999), using a cross-sectional dataset of 117 countries (developing and some developed countries) for 1 year (1993), also found that government spending on health played a minor role in determining infant mortality rates.

However there are studies that present different conclusions. *Anand and Ravallion (1993)* attributed "two-thirds of the elasticity of life expectancy with respect to average income

to the positive effect of income on public health spending.” using dataset for 22 countries for one year.

Bidani and Ravallion (1997) used a random coefficients model regressing aggregate life expectancy and infant/perinatal mortality rates across 35 countries against data on the distribution of consumption per person and allowing for differential impacts of public health spending and primary schooling. They found that public health spending matters and concluded that it matters most for poor people living in these countries (*Bidani and Ravallion 1997*). Both studies have been critiqued because their results are sensitive to the small sample size used.

The maternal and child health of women in this region requires attention. For example, despite implementation of family planning programs in certain countries such as Tunisia and Egypt, the overall population of the region is expected to double within 30 years even with the annual population decline of 2.3%. Increasing migration to the Gulf States in addition to migration from rural to urban areas within countries in this region is expected to have significant social and economic effects in addition to natural growth (*Aoyama, 2001*).

There are high total fertility rates (TFRs) in the MENA region regardless of the income level of the country. Despite several significant improvements in social sectors, women’s wellbeing in the MENA region is still jeopardized by many health issues among which the two most serious are high maternal mortality and high fertility (*Ibid*).

Global experience predicts an increase in the impact of STIs and adolescent reproductive health issues, and although the MENA region has comparatively low HIV/AIDS rates to other regions, these are increasing rapidly (*Aoyama, 2001; Fathalla & Rashad, 2006; Shawky, Soliman, Kassak, Orabi, El-Khoury, & Kabore, 2009*).

According to Fathalla & Rashad (2006), countries in the WHO defined Eastern Mediterranean Region (EMRO) such as the Gulf States, Iraq, Jordan, and Lebanon are off track for most of the targets adopted by the eight MDGs that are meant to be attained by 2015 according to the 2005 millennium project. Some countries in North Africa that are also in the EMRO such as Egypt, Libya, Morocco, and Tunisia are on the right track but need to speed up the program to achieve the goals (*Fathalla & Rashad, 2006*).

Contraceptive use among married women between the ages of 14-49 varies widely between EMRO countries from 9.9% in Sudan to 63% in Lebanon and Morocco. The surveys used to collect these statistics do not include unmarried women for cultural reasons. None of the countries in the EMRO region have participated in the WHO multicenter study on sexual relations among young people in developing countries (*Fathalla & Rashad, 2006*).

Bokhari et al. (2007) treated the variables government health expenditures and income as endogenous and therefore used instrumental variables (generalized method of moments—GMM-H2SL) to estimate the relationship between government health expenditures and health outcomes. They found that the elasticity of under-five mortality with respect to government expenditures was about 0.33 for developing countries and therefore the authors emphasized that even though economic growth is important for achieving better health outcomes, government spending on health is “just as important” (*Bokhari et al. 2007*).

These studies are considered an exception to the widely held view that country level aggregate health spending matters very little after controlling for country’s income.

The evidence to date is mixed and the results are inconsistent, so there is a need to gain more clarity about the effectiveness of investing in health care. The overwhelming majority of the cross-country studies (especially studies of developing countries) use cross-sectional datasets to

explore this question of effectiveness of health spending. However, our understanding of this issue would benefit greatly from using a panel dataset and adequately controlling for country specific effects, which has rarely been done in the literature due to the unavailability of panel data. In addition, this paper examines the interaction effects of health spending and government effectiveness.

Finally, our study sought to identify the main characteristics of health financing systems in MENA region to assess any relationship with the maternal and child health outcomes and provide recommendations for health policy makers.

Research design and methodology

A) Purpose and research questions

The objective of this thesis is to investigate the relationship between health care financing systems and cross-national Maternal, Neonatal and Child health outcomes. In doing so, we used the most recent available data over the last five years 2009 to 2013 for 21 countries from MENA region exploring the three dimensions of the maternal and child health outcomes namely a) Infant mortality b) Maternal mortality and c) Child health.

We followed the 2012 WHO classification of countries of the Region based on the population health outcomes, health system performance and the level of health expenditure into three groups, which is supported by the World Bank classification of MENA countries into low, lower middle, upper middle and high income levels. In this respect a total sample will be better since it will allow comparison within each group.

- Group 1 comprises countries where socioeconomic development has progressed considerably over the past decades, supported by high income (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates);
- Group 2 comprises largely middle-income countries which have developed extensive public health service delivery infrastructure but face resource constraints (Egypt, Islamic Republic of Iran, Iraq, Jordan, Lebanon, Libya, Morocco, occupied Palestinian territory, Syrian Arab Republic and Tunisia);
- Group 3 comprises countries which face major constraints in improving population health outcomes as a result of lack of resources for health, political instability, and other

complex development challenges (Djibouti, Somalia, South Sudan, Sudan and Yemen). (*WHO 2012*)

As regard to the timeframe, the author explored and analyzed the data of those classified states between 2009 and 2013 which enabled him to draw some conclusions and answer the research question. This specific timeframe was chosen to include the most recent and still reliable data available, also to have recommendations that based on the recent situation analysis.

B) Variables

Based on the different health care financing system options and our study will utilize cross-country data for the selected countries for public spending on health on a per capita basis together with selected control variables that determine maternal and child health outcomes. Control variables include data from the following maternal and child health outcomes, as total fertility rate, contraceptive prevalence, maternal mortality ratio, antenatal care coverage, births attended by skilled health personnel, availability of basic essential obstetric care and availability of comprehensive essential obstetric care, perinatal mortality rate, prevalence of low birth weight and prevalence of infertility in women. Our unified source is the WHO Eastern Mediterranean Region Countries statistics summaries sheets which include all data needed available for each country from 2009 till 2013.

C) Data

National Health Accounts (NHAs) is a globally accepted tool that essentially measures the “financial pulse” of national health.

D) Demographic data

We will study the following countries based on WHO classifications into three groups, high income countries (Group 1), intermediate income countries (Group 2) and low income countries (Group 3).

Table 1: Different groupings of the MENA countries according to WHO classification

Group1	Group2	Group3
Bahrain	Egypt	Afghanistan
Kuwait	Iraq	Djibouti
Oman	Jordan	Somalia
Qatar	Lebanon	S. Sudan
Saudi Arabia	Libya	Sudan
UAE	Morocco	Yemen
	OPT	
	Syria	
	Tunisia	

The variables that this study used include total fertility rate, contraceptive prevalence, maternal mortality ratio, antenatal care coverage, child and mother mortality and morbidity rates against some aspects of public expenditure to improve these outcomes. Those independent variables described against the public expenditure on health within selected countries categories to reflect the overall situation of maternal and child health outcomes in relation to the public spending. Both correlation and linear regressions were used to investigate the links between the different maternal and child health outcomes and the public financial spending “dependent variable”.

Regression was carried out to identify the relationships between each independent variable and public spending.

Significance in univariate correlation defined as $r > 0.2$ and $P < 0.05$ in two-sided. The factors that will be statistically significant in associations will be included in the multivariate linear regression models to identify the dominant factors which influenced by the public spending on health outcomes.

The module is as below:

OOP health expenditure = F (maternal mortality + under 5 mortality + neonatal mortality)

Significance also defined as $P < 0.05$ in 2- sided. PASW Statistic Version 18.0 (Copyright SPSS Inc.) used to do the analysis.

E) Hypotheses

Through this study, the researcher explored the hypothesis of whether spending more on health system always resulted in better outcomes, also if there any association between the spending and the maternal and child health outcomes? . Also our main argument is that: Can OOP health financing portion positively affect the maternal and child health outcomes?

We tested this hypotheses through health financing indicators and maternal and child health indicators using a unified data source, and selected the indicators that enabled us to reply to our hypothesis.

Findings

Spending more, efficiently, means better health outcomes

The researcher analyzed secondary data published in NHAs for MENA region countries based on the WHO classifications of the countries of the region. The data collected based on the recent available data for each CO based on the last five years (2013-2009).

The findings are summarized into three levels:

1. Basic description of the data and significant differences
 2. Correlation/ Association
 3. Regression
1. Basic description of the data and significant differences

Table 2¹ presents a general overview of the data where we can observe the demographic characteristics as well as the growth trends among the different three groups of counties. It shows also the difference in the (mean) of the different groups as regard to the different demographic variables.

¹ All tables of this section made by the researcher and the data source is the NHAs recent data 2012

MCH and health financing in MENA region, number talks...

Table 2 : Demographic characteristic of the MENA region countries

	General demographic data						Age		
	Area (KM2)	Population in thousands	Crude birth rate (%)	Crude death rate (%)	Growth rate (%)	Total fertility rate (/woman)	% of population aged less than 15	% of population aged more than 65	Life expectancy (Yrs.)
Group1									
Bahrain	767	1195	14.3	2.1	5.8	1.9	20.9	2.2	75.3
Kuwait	17818	3632	16	1.5	1.8	0.9	21.2	1.9	77.7
Oman	309500	3623	32.1	3.2	2.9	3.7	22.1	2.6	76.2
Qatar	11607	4357	11.9	1.1	2.1	2.1	14.8	1.1	78.2
Saudi Arabia	2000000	29196	22.5	3.8	3.2	2.9	30.4	2.9	73.8
UAE	83600	8264	9.6	0.9	6.1	2	19.1	0.9	77.4
Mean	403882	8377.8	17.73	2.10	3.65	2.25	21.42	1.93	76.43
Group 2									
Egypt	1009500	83210	31.9	6.4	2.1	3	31.5	3.7	70.4
Iraq	435052	34207	38.1	3.9	3.4	5.2	42.3	3.1	72.7
Jordan	89318	6388	28.1	7	2.2	3.5	37.3	3.2	73
Lebanon	10452	4104	22.2	5.6	1.7		24.6	9.6	81.5
Libya	1665000	5922	24.9	4.1	2.8	2.7	31.1	4.2	72.3
Morocco	710850	32597	18.5	5.1	1.1	2.6	26.6	5.9	74.8
OPT	6020	4357	27.1	2.6	3	4.4	40.2	2.9	72.7
Syria	185180	21639	30.8	3.8	2.5	3.5	37.2	4.1	73.1
Tunisia	154630	10674	18.8	5.9	1.3	2.2	23.5	7	74.9
Mean	474000.222	22566.	26.71	4.93	2.23	3.39	32.70	4.86	73.93
Group3									
Afghanistan	652225	26500	35.6	29.6	2.6	5.1	46	4	61
Djibouti	23000	865	42		3.9		35.2	4.1	52.9
Somalia	637700	8698	44	16	2.6	6.4	44.4	2.6	50
S. Sudan	640000	8260			2.2	6.7	51	2.6	42
Sudan	1882000	33976	29.4	17.5	2.5	3.9	42.6	5.5	59.8
Yemen	555000	22879			3		42.4	3.2	62
Mean	731654.167	16863	37.75	21.03	2.80	5.53	43.60	3.67	54.62
P value	.651	.393	.002	.000	.092	.001	.000	.013	.000

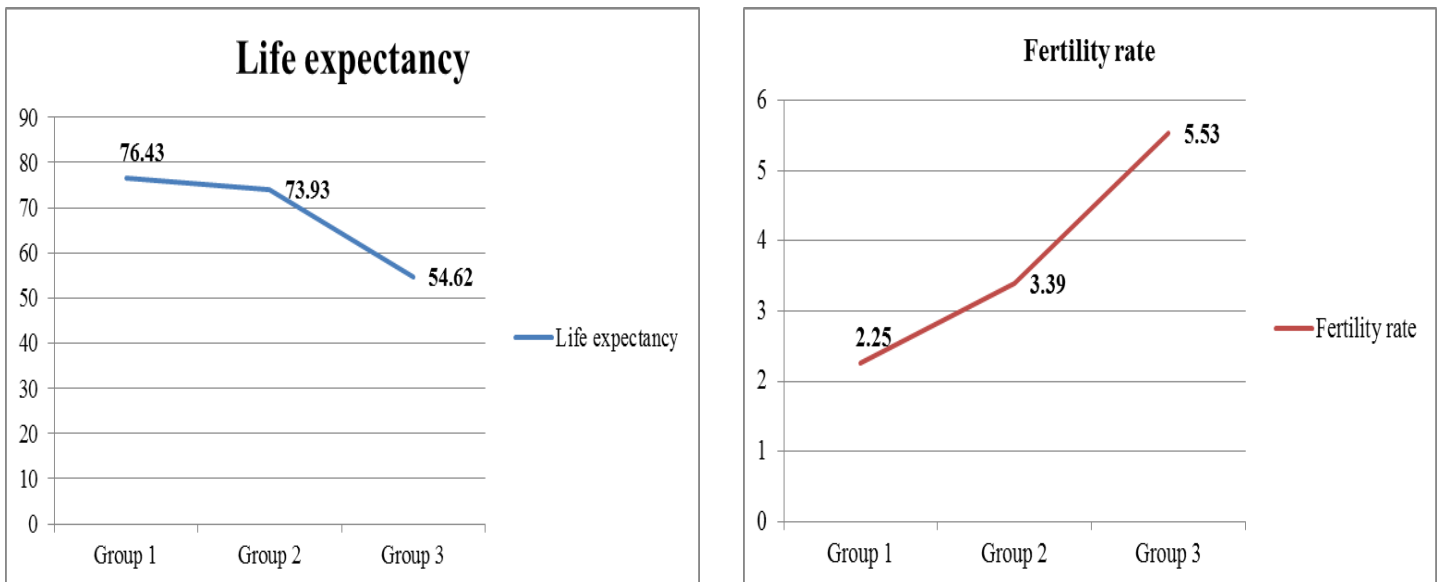
Based on **Table 2**, it is clear that the crude birth rate increased significantly through moving from one group to another, so the means for the first, second and third groups were 17.73, 26.71 and 37.75 respectively.

Same also applies to the crude death rate, as it was 2.1%, 4.93% for both the first and second groups respectively and then increased to a high level at the third group to be more than 21% of the whole population.

Interestingly, it is also important to highlight that the fertility rate is high in the low income countries (the third group) 5.53/woman than the other two groups. On the other hand the life expectancy is much higher in the first group (76.43 years) than the second and higher in the second group than the third group. P value is $< .05$

Figure 1 show the mean results for the three groups as regard to the life expectancy and fertility rate.

Figure 1 the life expectancy and the fertility rate among the three groups



Health financing system

Table 3 Health financing figures among the MENA countries

	Health Finance							
	GDP/Capita	Per capita total health expenditure (USD. PPP)	Per capita gov. expenditure on health (USD. PPP)	Total expenditure on health as % of GDP	Gov. Health Expenditure as % of total health Expenditure	OOP expenditure as of % total health expenditure	Gov health expenditure as % of total gov. expenditure	MoH budget as % of gov. budget
Group1								
Bahrain	19512	740	525	3.8	71	16.1	9.2	7.4
Kuwait	56426	1500	1233	2.7	82.2	16.1	5.9	6.6
Oman	25536	598	483	2.3	80.8	11.4	4.9	7.2
Qatar	92789	1776	1396	1.9	78.6	13.6	5.8	4
KSA	20540	758	522	3.7	68.9	18	6.8	6.8
UAE	49005	1640	1220	3.3	74.4	16.2	8.8	8
Mean	43968	1168.67	896.50	2.95	75.98	15.23	6.90	6.67
Group 2								
Egypt	2801	137	55	4.9	40.5	58.2	6.9	4
Iraq	3993	332	268	8.3	80.7	19.3	10.2	4.9
Jordan	4655	392	266	8.4	67.7	24.7	17.6	6.3
Lebanon	9904	622	159	6.3	25.5	56.5	5.8	2.6
Libya	9063	398	274	4.4	68.8	31.2	7.9	5.7
Morocco	3082	186	64	6	34.3	58	6.5	5.3
OPT	1697	248	91	16	37	37	10	10
Syria	2702	101	50	3.7	49	51	5.6	5
Tunisia	4331	267	147	6.2	55.1	39.5	10.8	7.9
Mean	4692.00	298.11	152.67	7.13	50.96	41.71	9.03	5.74
Group3								
Afghan.	584	56	9	9.6	15.6	79.4	3.3	3.7
Djibouti	1336	105	72	7.9	68.1	31.6	14.1	12.2
Somalia	284					55		
S. Sudan	1972	32	13	1.6	26.3	55.4	4	3
Sudan	1234	104	29	8.4	28.4	69.1	10.6	6.6
Yemen	1617	88	18	5.5	20.9	78.1	4.3	3.6
Mean	1171.17	77.00	28.20	6.60	31.86	61.43	7.26	5.82
P value	.000	.000	.000	.043	.001	.000	.487	.765

Table 3 shows the diversity between the three groups as regard to many health financing indicators.

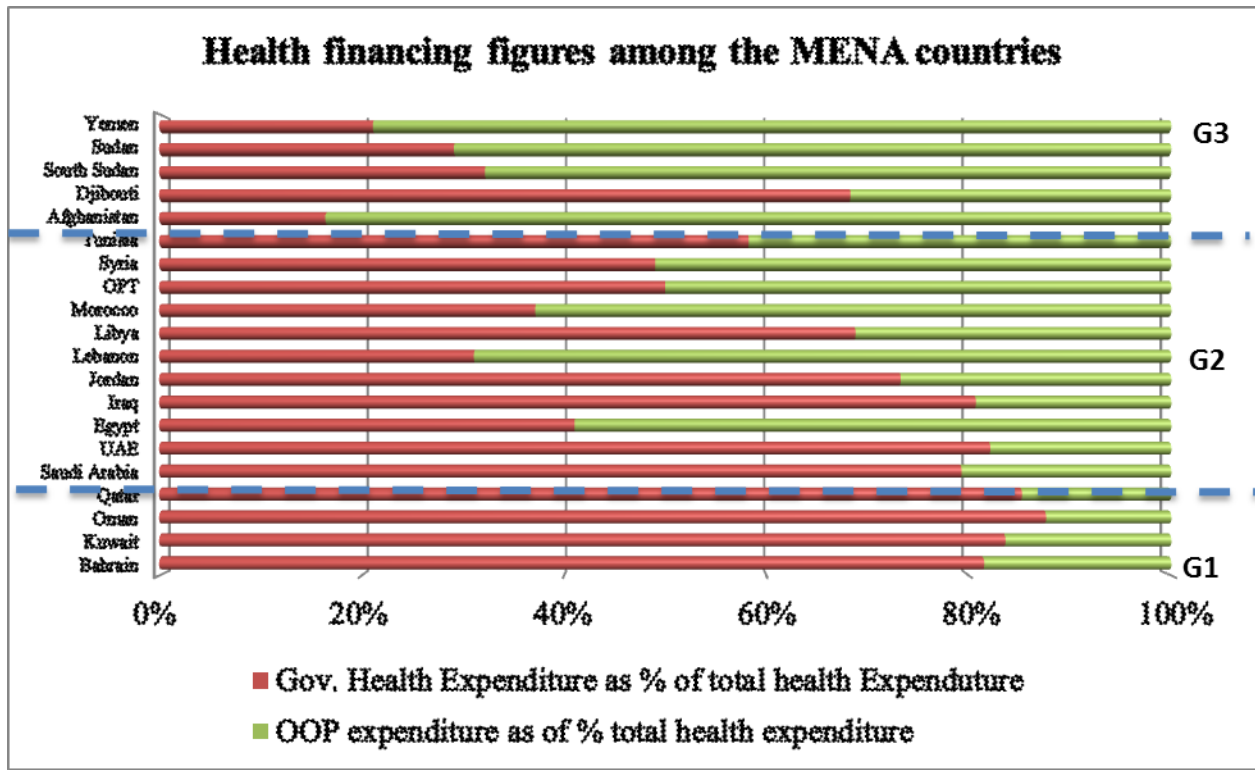
For the per capita total health expenditure, it is clear that the first group is far away from the other two groups. P value < .01

For the governmental expenditure, it is also clear that in the first group the governments contribute with high percentages toward the health related expenses with significant value compared to the other two groups P value < .01

For the OOP expenditure, it is also clear that the high income countries pay less in this regard than the low income countries, with high significant value compared to the other two groups P value < .05

Figure 2 describes the full health financing indicators, and explain the relationship between the total expenditure as % of the GDP, also the gov. health spending also the OOP spending % of the total health expenditure, in comparison to the three groups that separated y vertical lines. It was clear that the total expenditure on health as % of GDP has no significance increase or decrease in between the three groups, we even find it as high at the second group which is the group of the best RH outcomes. When it comes to the gov health spending we find it high at the first group (richest countries) and then decrease to reach the minimum at the third group, the opposite applies to the OOP which is minimal in the first group (best RH outcomes) and reach maximum at the third group. This denotes that it is not about the spending on health but the financing strategy that determine the best outcomes. what does the chart say, the OOP spending is not discussed enough earlier,

Figure 2 Health financing indicators among the countries of the three groups



Health infrastructure and resources

Table 4 Health infrastructure and resources among the MENA countries

	Health countries resources/infrastructures			
	Physicians / 10000 of population	Nurses / 10000 of population	Hospital beds / 10000 of population	Primary health care units / 10000 of population
Group1				
Bahrain	24.4	44.3	20.8	0.2
Kuwait	27	56	22	0.2
Oman	19.5	43.1	16.5	0.8
Qatar	34.9	61.9	12	2
Saudi Arabia	24.5	47.8	20.9	0.8
UAE	14.7	26	10.7	2.6
Mean	24.17	46.52	17.15	1.10
Group 2				
Egypt	7.7	13.8	5.2	0.6
Iraq	8.4	16.3	13	0.7
Jordan	27.1	46.6	18	2.4
Lebanon	36.5	29.1	34.5	2.3
Libya	20	71	37	2.6
Morocco	6.1	9	8.5	0.8
OPT	20.2	19.7	13	1.8
Syria	6.5	15	15.3	1
Tunisia	12.8	32.5	21.2	2
Mean	16.14	28.11	18.41	1.58
Group3				
Afghanistan	2.9	3.6	5.3	1
Djibouti	2.1	5.1	14.2	0.5
Somalia	0.3	0.8		4.8
South Sudan	0.2	0.2		
Sudan	3.7	10	8.2	1
Yemen	3	7.2	7.2	1.6
Mean	2.03	4.48	8.73	1.78
P value between the 3 groups	.001	.000	.175	.592

Away from the clear difference between figures of physicians and nurses among the three groups, the coverage of the primary health unit is the most important as one of the global health related indicator. There is a significant P value $< .05$ when comparing the three groups.

Maternal and Child Health

For the maternal and child health, the author selected specific variables that determine the maternal and child health outcomes. Variables for the maternal health are, the contraceptive prevalence, the antenatal care coverage, the percentage of birth attended by skilled health personnel. For the child health we selected, the new birth with low birth weight and also underweight children. We compared those indicators cross the three categories to find any differences between the three groups in relation to those indicators.

Table 5 Maternal and child health figures among the MENA countries

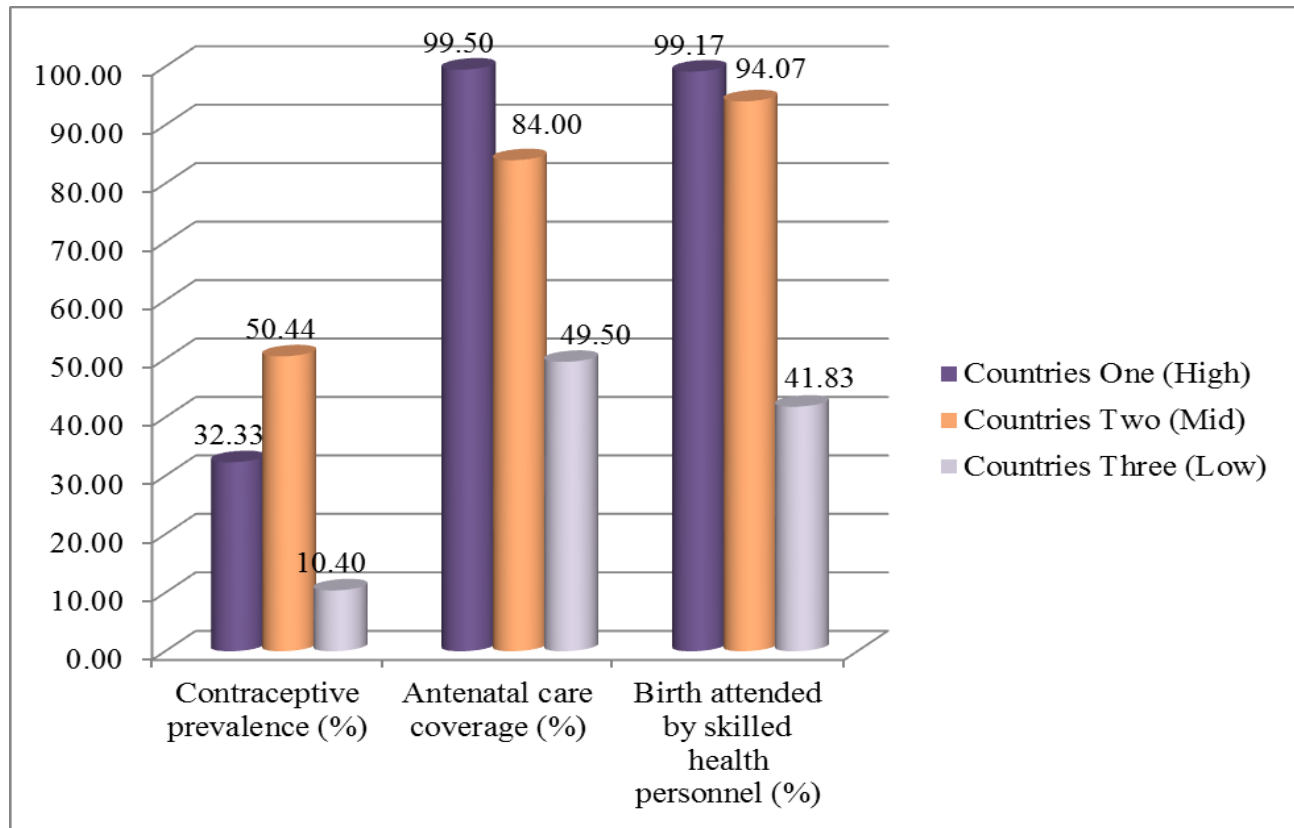
	Maternal and Child Health				
	Contraceptive prevalence (%)	Antenatal care coverage (%)	Birth attended by skilled health personnel (%)	New birth with low birth weight (%)	Underweight children (%)
Group1					
Bahrain		100	99	10	
Kuwait		100	100	8.3	
Oman	24	99	99	11.1	4.6
Qatar	36	100	100	7.9	
Saudi Arabia		98	97	7.5	
UAE	37	100	100	3.2	
Mean	32.33	99.50	99.17	8.00	4.60
Group 2					
Egypt	44	57	95	6	6
Iraq	53	51	87	5.9	8
Jordan	61	99	100	7	3
Lebanon	54	95	96	11.5	
Libya	46	93	100	4	4.8
Morocco	57	77	73.6	8	3.1
OPT	38	100	100	7.6	3.7
Syria	38	88	96	10.3	10.3
Tunisia	63	96	99	8.2	3
Mean	50.44	84.00	94.07	7.61	5.24
Group3					
Afghanistan	15	60	34	6	
Djibouti	13	73	56	20	28.9
Somalia	15	26	33	5	36
South Sudan	2	17	19		12.5
Sudan	7	74	73	31	32.2
Yemen		47	36	32	
Mean	10.40	49.50	41.83	18.80	27.40
P value between the 3 groups	.000	.000	.000	.018	.000

However the contraceptive prevalence is higher among the second group even more than the first group, but this may be attributed to the large population number of this group compared to the other two groups. On the other hand, the prevalence is the lowest at the third group.

For the Antenatal care coverage which is one of the most important maternal health indicators. As from the above tables, it showed that the coverage is 99.5, 84 and 49.5 for the three groups respectively. It was clear that there was a significant difference between means of the three groups with P value of $< .01$ “highly significant”

Same applied to the birth attended by skilled health personnel among the three groups; it was 99.17, 94.07 and 41.83 for the three groups respectively with no statistical significant relationship, P value $> .05$

Figure 3 Maternal Health figures among the countries of the three groups



Neonatal and Child mortality

For the neonatal and child mortality, the author selected specific variables that determine that health outcome. Variables are, the neonatal mortality rate (per 1000 live birth), the infant mortality rate (per 1000 live birth) and the under-five mortality rate (per 1000 live birth). We compared those indicators cross the three categories to find any differences between the three groups in relation to those indicators.

Table 6 Neonatal and child mortality figures among the MENA countries

	Neonatal and Child mortality		
	Neonatal mortality (per 1000 live births)	Infant mortality(per 1000 live births)	Under 5 mortality (per 1000 live births)
Group1			
Bahrain	3.6	8.2	9.6
Kuwait	5.5	9.5	11
Oman	6.7	10	11.6
Qatar	3.9	6.3	7.4
Saudi Arabia	5.2	7.4	8.6
UAE	5	7.2	8.4
Mean	4.98	8.10	9.43
Group 2			
Egypt	11.8	17.9	21
Iraq	19	28.4	34.4
Jordan	11.5	16.4	19.1
Lebanon	5.4	8	9.3
Libya	9.4	13.2	15.4
Morocco	17.8	26.8	31.1
OPT	12.8	19.2	22.6
Syria	8.5	12.3	15.1
Tunisia	9.5	13.8	16.1
Mean	11.74	17.33	20.46
Group3			
Afghanistan	36	71	98.5
Djibouti	31.4	65.7	80.9
Somalia	45.7	90.8	147.4
South Sudan	35.7	66.7	104
Sudan	28.6	49.3	73.1
Yemen	27	46.3	60
Mean	34.07	64.97	93.98
P value between	.000	.000	.000

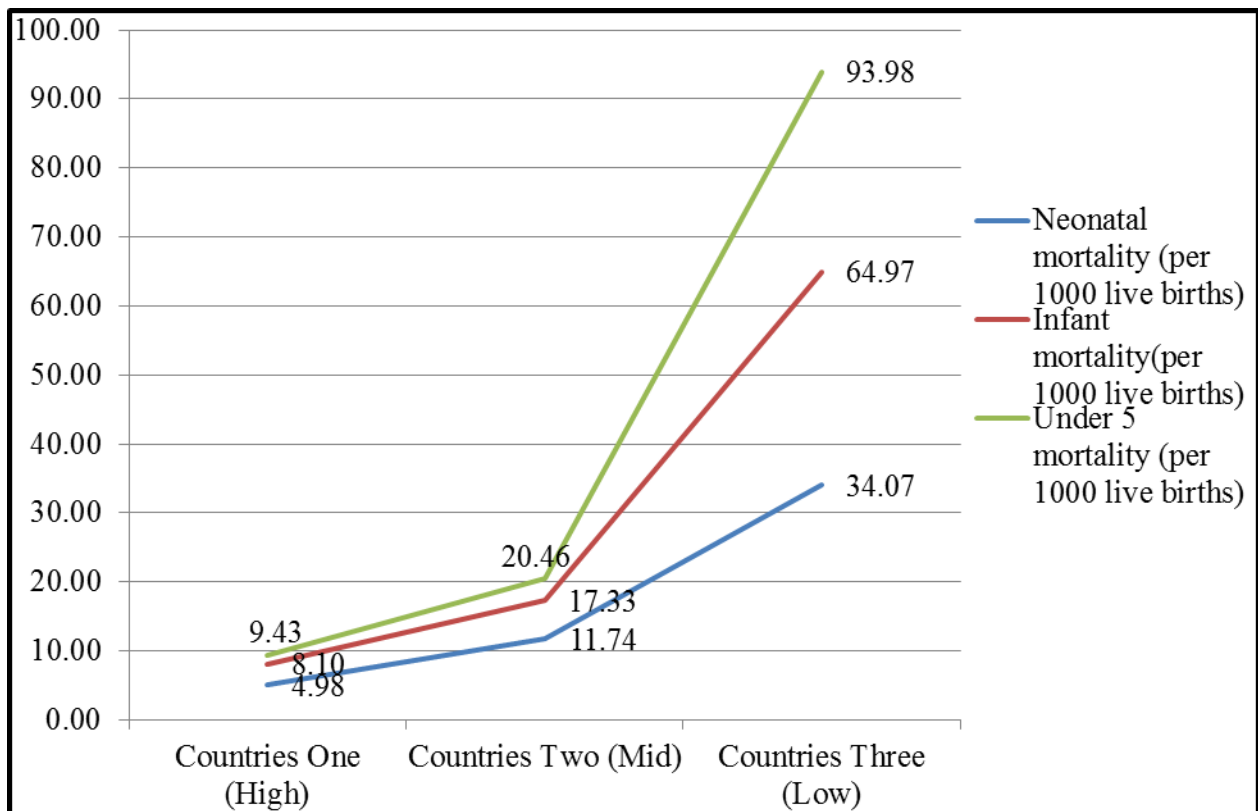
For the neonatal mortality which is one of the most important child health indicators. As from the above tables, it showed that the average neonatal mortality rates are 4.98, 11.74 and

34.07 for the three groups respectively. It was clear that there was a significant difference between means of the three groups with P value of $< .01$ “highly significant”

Same applied to the infant mortality, and under five mortality rates among the three groups; with statistical significant relationship, P value $< .05$

Figure 4 shows the relationship between the three groups as regard to the neonatal and child mortality

Figure 4 Neonatal, Infant and under five mortality rates among the countries of the three groups



After finalization of data description, we will move to find relationships between different variables.

Correlations between financial and health indicator

Table 7 Correlation between the three categories and the demographic health indicators among the MENA countries

		Crude_bir th_rate_	Crude_dea th_rate_	Total_fertility_rate_per _woman	Life_expectancy _years
Cat	Pearson Correlation	.737**	.804**	.765**	-.808**
	Sig. (2-tailed)	.000 Sig.	.000 Sig.	.000 Sig.	.000 Sig.

Table 7 shows that there is a significant correlation between the countries categories and the demographic health indicators among those countries. On the other hand, there was also a significant correlations between the main financial indicator (OOP) and those demographic health indicators as shown in Table 8

Table 8 Correlation between the financial and the demographic health indicators among the MENA countries

		Crude_bir th_rate_	Crude_dea th_rate_	Total_fertility_rate_per _woman	Life_expectancy _years
OOP	Pearson Correlation	.397	.759**	.502*	-.500*
	Sig. (2-tailed)	.092 Non Sig.	.000 Sig.	.034 Sig.	.021 Sig.

Table 9 shows that there is a significant correlation between the countries categories and the main financial health indicators including the OOP and the per capita total health expenditure among those countries.

Table 9 Correlation between the countries categories and the financial health indicators among the MENA countries

		Per_capita_ total_health_ _expenditur e_USD	Per_capit a_gov#_ expendit ure_on_h ealth_US D	Total_exp enditure_o n_health_a s_of_GD P	Gov#_Hea lth_Expen diture_as_ _of_total_ health_Ex penditure	OOP_ex penditure _as_of_ total_hea lth_expe nditure	Gov_health _expenditur e_as_of_to tal_gov#_ex penditure	MoH_bu dget_as_ _of_gov #_budget
Cat	Pearson Correlation	-.787**	-.774**	.429	-.732**	.805**	.055	-.141
	Sig. (2-tailed)	.000 Sig.	.000 Sig.	.059 Non Sig.	.000 Sig.	.000 Sig.	.816 Non Sig.	.555 Non Sig.

As the OOP expenditure can be considered as the main financial health indicators as per the (WHO 2007), the results show that there was also a significant correlations between the main financial indicator (OOP) and the other financial health indicators as shown in Table 10

Table 10 Correlation between the financial and the demographic health indicators among the MENA countries

		Cat	Per_capita_to tal_health_ex penditure_US D	Per_capita_go v#_expenditur e_on_health_U SD	Gov#_Health_Ex penditure_as_of _total_health_Exp enditure	MoH_bu dget_as_ _of_gov #_budget
OOP_expendit ure_as_of__tot al_health_exp enditure	Pearson Correlation	.805**	-.672- ^{**}	-.703- ^{**}	-.949- ^{**}	-.453- [*]
	Sig. (2-tailed)	.000 Sig.	.001 Sig.	.001 Sig.	.000 Sig.	.045 Sig.

Table 11 Correlation between the countries categories and Maternal and child health indicators among the MENA countries

		Physic ians__ 10000 _of_p opulat ion	Nurse s__10 000_ of_po pulati on	Contra ceptiv e_prev alence _	Anten atal_c are_c overa ge_	Birth_att ended_b y_skille d_health _person nel_	New_b orth_w ith_lo w_birt h_weig ht_	Und erw eigh t_ch ildre n_	Neonata l_morta lity_per _1000_l ive_birt hs	Infant_ mortali typer_ 1000_l ive_bir ths	Under_ 5_mort ality_pe r_1000 _live_bi rths
Cat	Pearson Correlation	-.743- ^{**}	-.754- ^{**}	-.532- [*]	-.744- ^{**}	-.806- ^{**}	.490 [*]	.796 ^{**}	.886 ^{**}	.855 ^{**}	.822 ^{**}
	Sig. (2-tailed)	.000 Sig.	.000 Sig.	.028 Sig.	.000 Sig.	.000 Sig.	.028 Sig.	.001 Sig.	.000 Sig.	.000 Sig.	.000 Sig.

Table 11 shows that there is a significant correlation between the countries categories and all the maternal and child health outcomes. On the other hand, there was also a significant correlations between the main financial indicator (OOP) and those demographic health indicators as shown in

Table 12

Table 12 Correlation between the financial and Maternal and child health indicators among the MENA countries

		Physicians__10000_of_population	Nurses__10000_of_population	Contraceptive_prevalence__	Antenatal_care_coverage__	Birth_attended_by_skilled_health_personnel__	New_born_with_low_birth_weight__	Underweight_children__	Neonatal_mortality_per_1000_live_births	Infant_mortality_per_1000_live_births	Under_5_mortality_per_1000_live_births
OOP_expenditure_as_of_total_health_expenditure	Pearson Correlation	-.606**	-.711**	-.308	-.592**	-.659**	.449*	.414	.637**	.595**	.578**
	Sig. (2-tailed)	.004	.000	.229	.005	.001	.047	.159	.002	.004	.006

Regression between other variables

Table 13A Regression between the financial and Maternal and child health indicators among the three groups in MENA countries

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.633a	.401	.288	26.84066

a. Predictors: (Constant), Gov#_Health_Expenditure_as_of_total_health_Expenditure, GDPCapita, OOP_expenditure_as_of_total_health_expenditure

ANOVA b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	7709.352	3	2569.784	3.567	.038a
	Residual	11526.736	16	720.421		
	Total	19236.088	19			

a. Predictors: (Constant), Gov#_Health_Expenditure_as_of_total_health_Expenditure, GDPCapita, OOP_expenditure_as_of_total_health_expenditure

b. Dependent Variable: Under_5_mortality_per_1000_live_births

Coefficients a

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	-8.437	79.418		-.106	.917
GDPCapita	.000	.000	-.128	-.534	.600
OOP_expenditure_as_of_total_health_expenditure	.919	.885	.651	1.039	.314
Gov#_Health_Expenditure_as_of_total_health_Expenditure	.150	.852	.109	.177	.862

a. Dependent Variable: Under_5_mortality_per_1000_live_births

When we run the regression between the Under5 mortality rate as dependent variable and the main financial indicators, OOP, GDP, Gov health expenditure as independent factors, Table 13 A shows that there is a significant relationship between the main financial indicators and the maternal and child health outcomes.

The module is as below:

$$\text{under 5 mortality} = F(\text{OOP health expenditure} + \text{Gov. health expenditure} + \text{GDP Capita})$$

Same also applies to the neonatal mortality rate, so when we run the regression between the neonatal mortality rate as dependent variable and the main financial indicators, OOP, GDP, Gov health expenditure as independent factors, Table 13 B shows that there is a significant relationship between the main financial indicators and the maternal and child health outcomes.

Table 14B Regression between the financial and Maternal and child health indicators among the three groups in MENA countries

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.690a	.476	.378	8.71615

a. Predictors: (Constant), Gov#_Health_Expenditure_as_of_total_health_Expenditure, GDPCapita, OOP_expenditure_as_of_total_health_expenditure

ANOVA b

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1105.785	3	368.595	4.852	.014a
	Residual	1215.541	16	75.971		
	Total	2321.326	19			

a. Predictors: (Constant), Gov#_Health_Expenditure_as_of_total_health_Expenditure, GDPCapita, OOP_expenditure_as_of_total_health_expenditure

b. Dependent Variable: Neonatal_mortality_per_1000_live_births

Coefficientsa

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-7.217	25.790		-.280	.783
	GDPCapita	.000	.000	-.218	-.971	.346
	OOP_expenditure_as_of total_health_expenditure	.402	.287	.820	1.400	.181
	Gov#_Health_Expenditure_as_of_total_health _Expenditure	.145	.277	.303	.525	.607

a. Dependent Variable: Neonatal_mortality_per_1000_live_births

Conclusion and policy implications

This study explored the relationship between the different health care financing options across the Middle East and North Africa “MENA” countries and the maternal and child health outcomes of people among those countries.

Our findings showed that there was a clear difference between the three countries groups in many areas of comparisons, those areas include the demographic characteristics, health financing system, health infrastructure and resources, maternal and child health and neonatal and child mortality. There was a significant relationship between the three groups and many indicators among those five thematic areas.

In conducting the correlation between the health financing indicators and maternal and child health indicators, there was significant correlation between those two groups either negatively or positively. The most significant relationships that reply directly to our research question were the correlation between the total health expenses and both (, neonatal mortality, maternal mortality and under 5 mortality), also significant correlation between OOP expenditure and both (crude birth rate, crude death rate, neonatal mortality, maternal mortality and under 5 mortality).

Our findings indicate that spending on health is significantly associated with improving the maternal and child health outcomes, and reduces infant and child mortality based on the significant correlations between those variables. Our results also indicate that improvements in government effectiveness enhance the effect of government health spending which resulted in lowering the infant and under-five child mortality. Thus, increasing government expenditures is

likely to lead to better improvements of health outcomes if it is accompanied by the right policies and institutions, which was the case of the first group of countries in MENA region.

The same also applied for OOP expenditure. There was significant negative correlation between OOP and the maternal and child health indicators. This can give a recommendation to policy makers to minimize this OOP portion, as with minimization of this portion lead to better maternal and child health outcomes.

Therefore, there is always potential for specific health financing allocation that can point the efficiency of health spending and in turn increasing the effectiveness of health spending beyond the levels estimated in this study. The in-depth analysis of one group of countries over a time period taking into consideration the composition of health spending can be relevant topic for future research.

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