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University of Clermont Auvergne

University of Pavia

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Marah Hanoon

Supervisor: Professor Cinzia Di Novi (University of Pavia)

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Measuring and Decomposing Inequality of Opportunity in Maternal and Child Health Care Access
Evidence from: The Occupied Palestinian Territories

Submitted by Marah Hanoon

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Supervised by: Professor Cinzia Di Novi

Associate Professor at the Department of Economics and Management, University of Pavia.

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Declaration of Authorship

I, Marah Hanoon, hereby declare that this Master thesis entitled – Measuring and decomposing inequality in maternal and child health care access in the Occupied Palestinian Territories, is my original work completed for the Erasmus Mundus Joint Master's degree in International Development Studies under the supervision of professor Cinzia Di Novi, University of Pavia. I confirm that all the sources and dataset used in this research have been duly cited and referenced. This study has not been published or submitted for any other degree or qualification except as specified.

Signature:

Marah Hanoon

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Jméno a příjmení:	**Bc. Marah HANOON, BA.**
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Zásady pro vypracování

The main aim of this study is to investigate the inequality of opportunity, and the main drivers contributing to the inequality in accessing basic maternal and child healthcare services in the west Bank and Gaza strip. Our study builds on the Human Opportunity Index (HOI) developed at the World Bank (2006) which measures how socioeconomic and demographic circumstances affect inequality of opportunity in accessing basic services (Barros et al., 2012). Specifically, this study focuses on several maternal and newborn health services: antenatal care, place at health facility, skilled birth attendance, receiving vaccination and postnatal care. We also break down the inequality by circumstances using Shapley's decomposition method. This method indicates the contribution of each circumstance variable to the total inequality of opportunity. This study uses data from the Palestinian Central Bureau of Statistics (PCBS). This Paper will utilize the data to compute the human opportunity index (HOI) and dissimilarity index (D-index). Furthermore, Shapley decomposition methods will estimate the relative contribution of circumstances beyond the control of children under-five and contribute to shaping their development outcomes later in life.

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Governement of South Australia and WHO. (2017). Progressing the Sustainable Development Goals through Health in All Policies: Case studies from around the world.

Hanan F Abdul Rahim, Laura Wick, Samia Halileh, Sahar Hassan-Bitar, Hafedh Chekir, Graham Watt, Marwan Khawaja. (2009). *Maternal and child health in the occupied Palestinian territory.*

Lu C, Cuartas J, Fink G, et al. (2020). Inequalities in early childhood care and development in low/middle-income countries: 2010–2018 . *BMJ Global Health.*

Sanoussi, Yacobou. (2017). Measurement and analysis of inequality of inequality of opportunity in access of maternal and child health care in Togo. *BMC Health Services Research, 17(Suppl 2).*

UNICEF State of Palestine . (n.d.). Retrieved from https://www.unicef.org/sop/what-we-do/health-and-nutrition

(2015). *World Health Organization Calender .*

Vedoucí diplomové práce: **prof. Cinzia Di Novi**
Katedra rozvojových a environmentálních studií

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L.S.

_____
doc. RNDr. Martin Kubala, Ph.D.
děkan

_____
doc. RNDr. Pavel Nováček, CSc.
vedoucí katedry

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Abstract

In developing countries of the Middle East, which incorporates Palestine, access to basic housing, health, and nutrition is characterized as being unequally distributed among children. This study aims to measure and decompose inequality in access to maternal and child healthcare services in The Occupied Palestinian Territories, through the implementation of the Human Opportunity Index and the Shapley Decomposition approach. By using the 2014 survey in the oPt, the study estimates the overall coverage and the level of inequality influenced by different circumstance variables. This study incorporates an extensive set of dependent and circumstance factors representing access to healthcare for mothers and children in the oPt. The study uncovered that an inadequate level of parents' education contributes to higher inequalities, more specifically the circumstance variable "mother's education" which indicates that the higher level of education attained by mother leads to the corresponding higher rate of access for overall healthcare services. Thus, the results obtained from this study provide the policy makers with a practical and analytical tool for policy analysis, to implement a proper reference to achieve progress in eliminating inequities in circumstances and opportunities for children.

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List of Abbreviations

Abbreviation	Definition
C	Coverage
CCS	Country Cooperation Strategies
DA	Development Assistant
DHS	Demographic and Health Surveys
D-Index	Dissimilarity Index
ECD	Early Childhood Development
GDP	Gross Domestic Product
HDI	Human Development Index
HH	Head of Household
HIC	High Income Countries
HOI	Human Opportunity Index
IoP	Inequality of Opportunity
LAC	Latin America and the Caribbean
LB	Lives Birth
LMIC	Low Middle Income Countries
MDGs	Millennium Development Goal
MENA	Middle East and North Africa
MICS	Multiple Indicator Cluster Surveys
MoH	Ministry of Health
NGOs	Non-Governmental Organizations
oPt	Occupied Palestinian Territories
PCBS	Palestinian Central Bureau of Statistics
SDGs	Sustainable Development Goals
UNICEF	United Nations Children's Emergency Fund
UNRWA	The United Nations Relief and Works Agency for Palestine Refugees in the Near East
WB	West Bank
WHO	World Health Organization

CHAPTER I. INTRODUCTION

The first chapter describes the background of the study, providing a general overview of healthcare indicators, followed by the country context for the Occupied Palestinian Territories. The chapter proceeds with the research objective along with the significance and applicability of this study. The last part of this chapter outlines the structure of the thesis.

1.1. Background

The major precondition for human development is access to maternal and child health services. Substantial improvements have been achieved in maternal mortality rates through investment in advancing the quality of care received by women throughout the overall pregnancy period. In the 1990s per thousand live birth maternal mortality was around four which almost halved by 2015. The decline in the maternal mortality rate was accompanied by a decline in under-five mortality rates. The World Health Organization has reported that between 2000 and 2015, 48 million children under five have been saved, and these results achieved throughout the preceding decades during the implantation phase of the Millennium Development Goals (MDGs). Despite the positive advances in maternal and child healthcare indicators, a greater number of under-five child deaths remain to be prompted by otherwise preventable and treatable infectious diseases and complications. Moreover, maternal and child healthcare services continue to be inequitably accessible on a global scale (Sanoussi, 2017). Thus, setting priorities is required to accelerate global health outcomes to reach the sustainable development goals for maternal and child health. A serious commitment to the forthcoming 2030 agenda is needed to achieve the SDG 3 targets for sustainable development goals regarding reducing maternal mortality rates to 70 per thousand LB, ending preventable causes of death among newborns to at least 12 per thousand LB, and under the age of five children mortality to least 25 per thousand LB, and more targets to be reached (World Health Organization, 2021).

Another pressing issue is considered the widening gap of relative mortality not just between HIC and LMIC but within each country among rich and poor children. An Interesting aspect is that the mortality rate tends to be decreasing at a faster base among the better off. To achieve the SDGs with the current insufficient rates of progress in LMICs, a necessary step would be to address the socioeconomic inequities in child health and nutrition (Barros et al., 2010). Aside from socio-economic factors, geographic inequities such as urban/rural differences are relevant determinants of child health access, directly affecting the availability of healthcare services. For some societies, gender inequity also seems to be a significant aspect. In this study, we will study different socioeconomic and cultural factors contributing to inequities in maternal and child healthcare services access.

## 1.2. Significance and Applicability of the Research

The purpose of the study is to investigate the coverage and causes of inequality for basic maternal and child healthcare services in the Occupied Palestinian Territories. Even though several researchers worked on maternal and child health in the oPt, inequalities in access to maternal and child health services topic were not explored. The present study extends to the Human Opportunity Index HOI by adopting recent data from 2014 MICS in the Occupied Palestinian This study incorporates an extensive set of dependent and circumstance factors representing access to healthcare for mothers and children, in particular, five dependent variables that reflect access to health composite indicator measured compared to a set of circumstance variables included in four categories; Characteristic of Child, Demographic characteristics of household, Economic Attributes, and Demographic characteristic of the household. The findings of this dissertation are expected to be informative for the national healthcare system inclusion strategies in the Occupied Palestinian Territories. The study seeks to provide specific policy recommendations towards ensuring equality and equitable maternal and child healthcare services.

1.3. General Overview

In developing countries of the Middle East, which incorporates Palestine, access to basic housing, health, and nutrition is characterized as being unequally distributed among children. Household characteristics, parental, and public health inputs such as the availability of basic sanitation services are the main determinants. Thus, inequality of opportunity is considered as the main cause of the inequality in child health and nutrition access, contributing to later inequality in life (Krafft & El-Kogali, 2014). The inequality of opportunity and thus inequity of outcomes are under-researched and under-resourced in the Middle East region, leaving them aside from the contemporary political agendas despite their urgency.

A significant aspect characterizing the Palestinian health system is its fragmentation, imposing enormous challenges. In addition, several adverse social determinants negatively impact the health system. Life under occupation constitutes a major impediment to health care for Palestinians, deteriorating the availability, accessibility, and quality of basic health services (MAP, 2021). As we can observe from **Figure 1,** countries with high levels of life expectancy, particularly Lebanon and Israel, are the ones associated with the lowest infant, under five, and maternal mortality rates. Among the selected Eastern Mediterranean countries, Palestine in both regions, the West Bank and Gaza Strip, has the highest infant and under-five mortality rates, however, Jordan seems to be dominating with regards to infant mortality rates. This graph focuses our attention on substantial differences in both mortality rates and life expectancy between Palestine and Israel, once again putting forward the implications of unfair power dynamics, given the fact that Israel is an occupying power responsible for providing healthcare services for Palestinians (MAP, 2017). Despite the performance of absolute indicators, the rates of improvement are better than average in Palestine compared to the Eastern Mediterranean Region.

Figure 1. Key health outcome indicators in Palestine, Israel, and selected countries of the Region, 2013
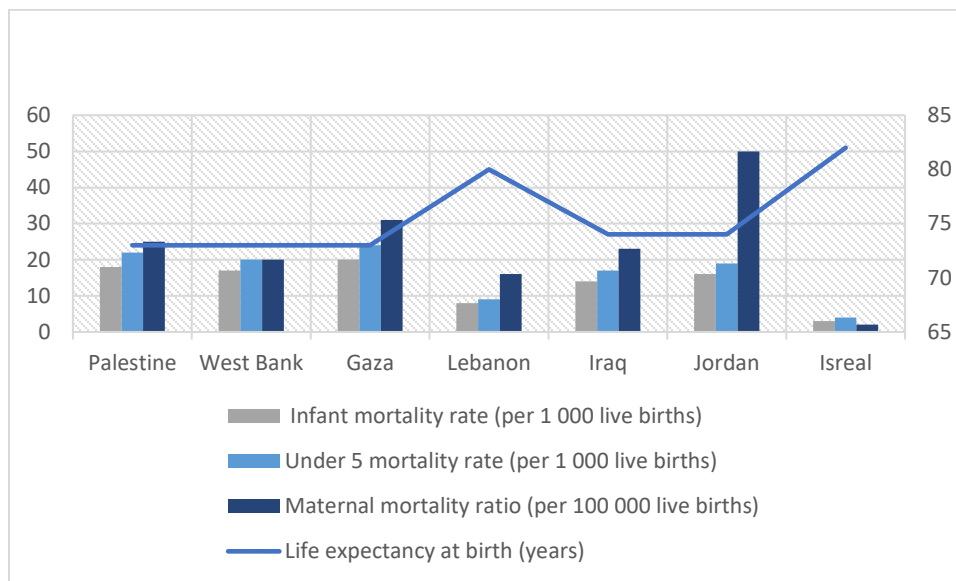
Sources: World health statistics 2015; MICS 2014; Palestine Health Information Centre 2015.

1.4. Macroeconomic and structural characteristics of OPT

The healthcare sector situation in Palestine is significantly different compared to other countries in the Middle East. The healthcare in the oPt is provided by four major providers, mainly the Ministry of Health (MoH), and UNRWA, which mainly provides primary care services, in addition to NGOs and the private sector. The Health sector inside the Occupied Palestinian Territories faces many challenges. Accessibility is a prerequisite component of the right to health, as it is a consequential aspect alongside the availability and quality of the healthcare services provided. Yet so far Palestinians residing in the West Bank and Gaza suffer physical and bureaucratic restrictions accessing effective and equitable healthcare services which have a bearing effect on children as much as on adults (MAP, 2017).

These primarily relate to restrictions placed on freedom of movement as manifested by militarily rule over Palestinians in the oPt, extensive military offensives damaging civilian infrastructures such as homes and hospitals. Furthermore, the separation wall which is one of the most imposing parts of the occupation where 85% of it is built inside the Palestinian land, along with the expansion of the illegal settlement with over 200 outposts across the Occupied Palestinian Territories land (OCHA - WHO, 2010). Adding to the complex political and administrative division of the geographical area of Palestine. The Occupied Palestinian Territory is divided into two geographic areas: The West Bank (Including East Jerusalem) and the Gaza Strip, where restrictions on freedom of movement imposed through 14th years of consecutive siege of the Gaza Strip. While

the West Bank is divided into three areas[1] (A, B, and C) with at least 593 Israeli checkpoints and roadblocks across the mentioned areas. The Israeli permit system[2], causing an inability to safeguard the security and human rights of the Palestinian population, augments the economic contraction, which impedes access to health care services across oPt, adding extra weight on fragmented Palestinian people (HRW, 2021). This persistent insecurity and the constraining underpinnings of the oPt, challenging the resilience of the Palestinian society. Moreover, the lockdown measures imposed by the COVID-19 outbreak in the oPt in early March 2020 have grave further threats to the vulnerable Palestinian population.

Table 1 Summarizes the main macroeconomics indictors in the Occupied Palestinian Territory. Since 2013 the GDP per capita has been fluctuating with steady decline in the past couple of years resulting in a diminishing growth rates of GDP per capita. The population has been steadily increasing. However, the trend has been negative for the unemployment rate. Almost 26% of the total labour force of the country are unemployed. Based on the World Bank data in 2019 29.2% of the total population lives under the national poverty threshold.

Table 1. Economy of the Occupied Palestinian Territory: Key indicators

	2013	2014	2015	2016	2017	2018	2019
Macroeconomic performance							
GDP growth (annual %)	4.70	-0.16	3.72	8.86	1.42	1.23	0.95
GDP per capita (constant 2010 US$)	2891.3	2819.8	2858.5	3042.8	3025.2	2985.8	2939.3
GDP per capita growth (annual %)	2.21	-2.47	1.37	6.45	-0.58	-1.30	-1.56
Population and labour							
Population (millions)	4.08	4.17	4.27	4.37	4.45	4.57	4.69
Unemployment, total (% of total labour force) (national estimate)	19.89	20.53	23.00	23.94	25.68	26.26	25.34

Sources: The World Bank Development Indicators.

Despite the suboptimal economic and political predicament observed within the country, the oPt overall health outcomes have sustained a reasonably good performance on many human development dismissions, reflecting the resilience of the Palestinian and their health sector (The World Bank , 2012).

1.5. Demographic Peculiarities

The oPt characterized with high population growth, the World Bank (2021) estimated an annual population growth rate of 2.5% in 2019. However, the oPt is experiencing an epidemiological transition, with the total

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[1] According to the Oslo II Accord established in 1995, the West Bank to be divided into three areas. With Area A controlled by the Palestinian Authority, Area C by Israel administration, and Area B under joint control.

[2] Israeli permit regime is a complex system, requires Palestinian residents of the west Bank and Gaza an exit permit obtained from the Government of Israel. For instance, Palestinians who require unavailable medical treatment outside of the region of their residence need an exit permit. The WHO describes the process of obtaining the Israeli permit as **"neither transparent nor timely".** (WHO, 2013)

fertility rate decreasing, slowing down the population growth. Based on the PCBS statistics, 5.1 million Palestinian live in Palestine across the WB and Gaza Strip, and about 13.5 million Palestinians refugees[3] around the world. The Gaza Strip is considered a highly dense region, according the Palestinian Bureau of Statistics 2.05 million Palestinian live there, with more than 70% of Gaza's two million inhabitants are refugees divided in 8 refugee camps (UNRWA 2021). Moreover, since 2007, the humanitarian situation has worsened in the Gaza Strip due to prolonged Israeli military hostility for 14 years. Severe economic deficiencies and restricted movement results in a complete siege. Effectively, the two million population in the Gaza Strip is confined to a 365 km² enclave. The West Bank has a 3.05 million estimated population with a 25% Palestinian refugee population, divided around in WB towns and villages and in 19 UNRWA registered camps. In addition, 40,000 Bedou-ins[4] displaced tribes live around area A and C in the oPt.

The Palestinian population characterized as young population. According to (UNICEF, 2018) almost half of the Palestinian society are children, with 2.3 million children[5] out of the whole population, 1.3 million reside in the WB, while 1 million children live in Gaza. By mid-2020 38% of the total population consisted of individuals aged (0-14) years. Of which 36%, and 41% reside in the West Bank and Gaza Strip respectively. Thus, improving access to decent and high standard maternal and child healthcare services is considered a critical element to boost human capital health outcomes of the current and forthcoming population in the oPt, where approximately 40% of the population are women of reproductive age and children younger than 5 years old (PCBS, 2020). Whereas, 3% is the percentage of the population who are elderly with 65 years and above, where 4% lives in the West Bank, 3% in and Gaza Strip (PCBS, 2019).

1.6. Research Objectives

The objective of this study is to analyse the **Human Opportunity Index**, a synthetic measure first proposed by the World Bank, and developed by Barros et al, (2008). The novel index was applied in Latin America and the Caribbean (LAC) to measure inequalities among children. The Human Opportunity Index (HOI) is a composite indicator which is an effective measure of societal progress in providing equitable opportunities for all children. The main **use of the HOI** is to assess to which extent individual circumstances that are beyond child control such as characteristics of the child; gender of the child, parents education level, and economic

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[3] Palestinian refugees are referred to "persons whose normal residence was in Palestine before 1948, and who lost their homes and means of livelihood during the 1948 Palestinian "Nakba" catastrophe in Arabic. Which refers to the mass systematic displacement of Palestinians from the British Mandate controlling Palestine during Israel creation (1947-49) (UNRWA , 2021). 800 thousand Palestinians who lived in 1,300 Palestinian villages and towns, were displaced because of the Nakba (PCBS, 2019).

[4] Bedouins Palestinians are a semi-nomadic tribal community, engaged in herding activities and agriculture practices. Prior to Israel formation in 1948, Bedouin lived in the Negev area "desert southern Palestine" which during the 1948 **most** Bedouin were expelled or fled their homes and moved to neighbouring countries, the West Bank and Gaza (Minority Rights Group International, 2011).

[5] Referring to the UNICEF Convention on the Rights of Children, the definition of children includes every human being below the age of eighteen years old.

attributes of the household, in addition to the demographic and geographic characteristics of the household, affect access to specific basic services among children such as health, sanitation, nutrition and early care development. This study mainly examines **inequities in access** to maternal and new-born health services **in the Occupied Palestinian Territories.** To subsequently determine the marginal contribution of each circumstance variables in the total inequality of opportunity we utilize the **Shapley's decomposition method.** The outcomes of this paper should be used as an evidence to support equalizing opportunity through public policies in the oPt.

1.7. Outline of Chapters

Subsequent chapters are outlined as follows. *Chapter II* reviews the existing theoretical review for access to health and the inequality concept. Followed by discussing empirical literature studies that utilized the Human Opportunity Index (HOI), relative studies within the country context, to develop the methodological approach for this study. *Chapter III* elaborates on the data and methodology that has been adopted for this study. *Chapter IV* presents and discusses the main results of the HOI and the decomposition of the inequality index, and the main findings of this research. *Chapter V* provides concluding remarks and recommendations.

CHAPTER II. LITERATURE REVIEW

This chapter presents a theoretical *(Section 2.1)* and empirical *(Section 2.2)* review of the relevant literature related to this study. Section *2.1* provides a theoretical overview of the access concept, and the concept of inequality, by highlighting the most important contributions within the healthcare terminology. It also highlights the conceptual framework, created by the authors, which leads the analytical proceedings of this research. Section *2.2* presents a review of empirical studies, including a review of the opportunity approach and the Human Opportunity Index, including studies conducted at regional levels. Section *2.3* discusses the country context, reviewing studies about access to maternal and child healthcare services. Concluding the chapter with a brief explanation of the existing literature gap.

2.1. Review of the Theoretical Literature

2.1.1 Conceptual Framework of Access to health care

Penchansky et al. (1981) propose a definition of access as a degree of fit between the client and the system, which is in correspondence with Andersen et al. (1978) model and enabling variables. Specified in five key dimensions of access including: availability, accessibility, accommodation, affordability, and acceptability. These variables are essential along the side with the demand side factors to attain equitable healthcare access for all. Guagliardo (2004) argues that access to primary health care services is essential for the health of the overall population. The author states the importance of uncovering barriers that might affect healthcare utilization rates and general population health, mainly geographic availability and accessibility[6], referred to as spatial accessibility. Goldsmith & Ricketts (2005) propose a dynamic narrative of access, in which they outline how to enhance the health care delivery system. The authors explain the need to employ access models to formulate health policies that reflect world processes. Mcintyre et al. (2009) theorized access to healthcare as a multidimensional concept that involves interactions between individuals and the health care system along with households and communities. In addition, it includes empowerment of individuals to utilize the health care services. Rutherford et al. (2010) noted consistency with Mcintyre et al. (2009) approach, considering access to health care is multidimensional, hence, including factors besides distance and cost need to be considered for health care provision planning policies. The authors explain that adequate access to health care services is essential for reducing under five mortality in developing countries.

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[6] Availability implies to the number of local service providers a client can choose, and Accessibility refers to the distance between the patient and the local service providers. Guagliardo (2004) proposes different methods to measure spatial accessibility by: provider-to-population ratios, distance to closest provider, distance to a set of providers, and Gravity models of provider influence.

2.1.2. The Concept of Inequality of access to healthcare

Kitagawa and Hauser (1973) were among the earliest classical analysts in the field focused primarily on studying socioeconomic disparities concerning inequalities in health care utilization. Kosa and Zola (1975) appear to support the previous notions by studying the significant effect of poverty on accessing health care. In a major advance, Aday (1976) developed an indicator for equitable access to healthcare services, by measuring healthcare utilization to disability days. One of the pioneering papers in the study of access to healthcare among children was suggested by Dutton (1985), who attempted to investigate the access to healthcare services under varying socioeconomic conditions for children living in upper- and lower-income households. Barros et al. (2008) examines the impact of personal circumstances on children's access to basic services, the authors call for the need to reduce inequities in order to overcome development challenges.

Bellieni (2016) traces advances in the importance of the first 1,000 days of the child's life, as this period is considered crucial and has a profound effect on child physical and cognitive lifelong development as well as prosperity. The long-term impact of receiving appropriate health care interventions is thus paramount during the 1,000-day window in children's lives. Yet according to Walker et al. (2007), at the minimum of 200 million children in developing countries cannot reach their full development potential, due to poverty and other health and social aspects that could prevent them from attaining a healthy life. In 2017, around 5.4 million children under the age of five died, of whom 2.5 million death occurred within the first 28 days of the child's life[7]. Nevertheless, preventable and treatable diseases are causing more than 5.3 million of under-five child mortality, such as pneumonia, diarrhoea, birth defects, and malaria. Such high rates occur in low-income and developing countries (World Health Organization, 2018).

Previous work has addressed the need to reduce the socioeconomic inequities in child health care access to achieve SDGs, however, we need to address different factors causing inequities beside socioeconomic issues, such as geographic inequities; rural and urban, demographic factors and other disparities. (Barros et al., 2010)

2.2. Review of Empirical Literature

Several empirical studies have been conducted across the developed and developing world to measure and analyse inequities in access to healthcare services. In order to understand how children's circumstances, affect inequity, with an overall aim to identify and develop suitable policy interventions. Thus, such studies contribute to minimizing the impact of such predetermined factors on access to basic healthcare services. Preliminary work in this field primarily focused on the overall inequality of health and the determinants of individuals' health status. There is a vast amount of literature that studies the supply and demand factors of inequalities associated with healthcare services, such as insurance policies and health system infrastructure, etc, while

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[7] Children Under five mortality rates are the highest in the sub-Saharan Africa and in low-income countries, in which WHO reports record 7% death rate among newborns.

focusing on the demand side socio-economic factors such as income and household wealth. Hence, investigating the scope of inequality in access to healthcare services is impossible without examining the degree of inequality associated with demand side socio-economic factors, which is precisely the literature gap that we want to address in our study.

2.2.1 Review of Opportunity Approach

The opportunity approach is defined by Roemer (1998) in which he constructed a framework defining equality of opportunity by examining the *objectives, circumstances, type, effort, and policy*. The *objectives* are to generate an outcome that contributes to the well-being of people who have unequal opportunities. The *circumstances* are defined as a set of environmental influences that are beyond the individual's control. Whereas *efforts* implies chosen actions that it is under the individual's control. The extent to which individuals in the population are divided into groups based on their given set of circumstances is assessed by type. Social *policy* intervention is a tool to affect the level at which individuals attain the objectives. The approach endeavours to compute feasible policies intervention where individuals obtain the objectives independently of their circumstances and are only influenced by their effort. The literature concerned with health inequality proposes two main approaches to measure inequality in access to healthcare outcomes, *univariate and bivariate approaches*. Sanoussi (2017) implements the opportunity approach to assess the access to maternal and child health care in Togo, taking into consideration both the individual's life circumstances, and effort's, to measure the access to health inequalities.

A number of studies have attempted to measure the patterns of inequality of opportunity on early childhood development outcomes in different of countries. Assaad et al. (2012) investigates the pattern between the socioeconomic as well as the health and nutrition outcomes among children under the age of five in different Arab Countries and Turkey. The authors analysed several Demographic and Health Survey (DHS), using stunting, wasting, standardized height and weight of children as indicators. The study found that Morocco had the highest total inequality among the studied countries, while Turkey demonstrated the highest inequality of opportunity, whilst Jordan demonstrated the lowest total of inequality of opportunity. Assaad et al. (2012) outlines that total inequality is increasing in Egypt overtime due to different geographical and demographic variables.

In the same line, Krafft & El-Kogali (2014) assessed inequality of opportunities in twelve countries across the Middle East and North Africa region MENA. The study investigates eleven early life course development indicators, in terms of health, nutrition, and social-emotional development. The paper aims to measure inequality of opportunity among children under the age of five and to decompose the inequality into the shares related to different circumstances. The authors found significant inequalities due to wealth, mother's education, and geographic differences, with substantial variation in outcomes and observed inequalities across countries.

It is interesting to note that the wealth serves a large portion of inequality in both Jordan and Egypt 38.2%, 36.8% respectively. Whereas in Tunisia, geographic location and wealth have substantial effects on inequality.

2.2.2 Review of Human Opportunity Index and Healthcare access

The Human Opportunity Index is a measure developed by the World Bank, proposed by Barros et al. (2008) to assess children's access to basic services, the *HOI is an indicator to measure society progress in providing universal coverage for a certain opportunity along with the overall coverage rate of that opportunity among people with different circumstances.* This section includes review of literature that applied the Human Opportunity index HOI to assess inequality in healthcare access and its health outcomes on children.

Several studies have attempted to examine the inequality of opportunity by identifying gaps in child health and nutrition outcomes under several circumstances. Usually, IoP studies of child health outcome in high-income countries analyse the multifaceted relationship of children's life circumstances, individual's efforts, and their health status. Such studies often rely on cohort data. On the contrary, similar IoP studies in low- and middle-income countries tend to use cross-sectional surveys (Sanoussi, 2017). Example of such studies includes Krafft & El-Kogali (2014); Ersado & Meltem (2014); Thakare & Di Novi (2020); Tsawe & Susuman (2019) in which they analysed the Demographic and Health Surveys (DHS).

To measure inequality of opportunity in access to basic health care services among children, a number of studies utilized the Human Opportunity index. To calculate the HOI we need to estimate the coverage using a composite indicator for access to health which is usually measured by the occurrence of mother having any blood tests during pregnancy, mother's receiving adequate prenatal care, as well as postnatal care such as delivery at a health facility, a skilled professional supervision of the delivery, and if the child received any check-ups after birth and regular vaccination. As well as analysing other dependent variables. Ersado & Meltem (2014); and Amara & Jemmali (2017) considered the health indictor to include access to basic services such as a such as housing, clean water, and sanitation facilities.

A study by Sanoussi et al. (2020) examine the contribution of children to circumstances that are beyond their control and influence their development outcomes later in life. The study employed data from the Multiple Indicator Cluster Survey (MICS) for the period 2014–2019 in three sub-Saharan African countries, these countries were characterized with low human development index. The authors utilized two methodologies in measure inequality in access to maternal and child healthcare services, the Human Opportunity Index, and the dissimilarity index (D-index), in addition to the Shapley decomposition method. The authors considered three composite indicators for healthcare outcomes. The indicators were based on access to prenatal care, such as birthplace (health facility or somewhere else), births attended by a skilled healthcare provider, and postnatal examinations, whether the child received regular vaccination, in addition to access to drinking water and sanitation facilities. For nutritional status, the indicators used were blood tests, undernourishment, weight and

height. Based on the above variables, three indicators were constructed for 1) *access to prenatal and postnatal healthcare services* 2) *access to immunizations* 3) *and access to basic housing services.* The authors considered a number of circumstance variables for health and nutrition determinants in each country. The study used a total of seven variables including place of residence, gender of the child, under 5 years old, children in the household, parents' education, and the economic wellbeing. The study found that in both Guinea Bissau and Mali, inequality of opportunity seems to be a significant aspect in seeking prenatal and postnatal healthcare services. While in Congo, IoP accounted for 49.16% when considering housing services. Low Human Opportunity Index in these three countries is indicative of low coverage rates due to inequitable access to healthcare services, specifically for children living under certain circumstances within the country.

Several studies conducted in the Middle East and North Africa addressed inequality of opportunity in access to health among children. Although the region has substantial deficits and high inequalities, most of these studies are concentrated within the extent of inequality in health in North Africa. Amara & Jemmali (2017) measured inequalities among children in health and nutrition outcomes in Tunisia, using data from the fourth round of the Multiple Indicator Cluster Survey (MICS4 Tunisia) carried out in 2011-2012. Where access to healthcare services and basic housing services is inequitably distributed among children like most developing countries. The dependent variable consisted of antenatal care (measured by the mother rate of having blood tests throughout pregnancy), birth taking place at a health facility, and birth attended by skilled healthcare professionals. And for the nutritional outcome, the variables used were height and weight. In addition, the nine circumstance variables were grouped into four dimensions: 1. child characteristics 2. Demographic characteristics of household 3. geographical location of the household 4. socio-economic characteristics of the parents. Findings reveal that geographical circumstances, namely region, urban and rural, the socio-economic characteristics of the parents, in particular their education level and wealth index were the most significant contributors, with an important influence on health and nutritional inequality. In another study, Barros et al. (2012) ranked Egypt the 50th country regarding skilled birth attendant and measles vaccination rates, compared to 54 countries positioned as the least inequitable country among the selected countries.

Tsawe & Susuman (2019) investigated inequality of access in maternal and reproductive health services in Sierra Leone. the study used the Demographic and Health Surveys (DHS) conducted in 2008 and 2013 to calculate the Human Opportunity Index. This paper outlines five dependent variables, firstly receiving adequate antenatal care, delivery care, and the use of any contraception method. With nine independent variables, mainly i. maternal age, ii. marital status iii. maternal awareness iv. wealth index v. under 5 children living in the household vi. access to mass media, vii. decision-making power, viii. residence, and ix. region. The authors used the Shapley decomposition method, and highlighted that wealth index and maternal awareness, in addition to the place of residence are key factors in determining inequality in maternal and reproductive health services uses.

2.3. Country Context

In Palestine, during the last two decades, the national health indicators have been improving at a tangible level. With a noticeable increase over the past eight years in the average life expectancy, reaching 73.3 by 2016. Moreover, a decline in maternal mortality to 24.1 per 100,000 children (State of Palestine, 2018). Thanks to the appropriate interventions by different key health providers, who enabled by sufficient development assistance DA. According to World Health Organization CCS, 48% of the healthcare funding comes from external donors in response to the humanitarian crises enforced by the Israeli occupation in the oPt (Hlasny, 2016). However, rates of neonatal mortality (within 28 days from birth) and under-five mortality remain high in the oPt. Thus, amplifying required accelerating effort in the health system to reach the SDGs targets for maternal and child health.

Physicians for Human Rights (2015) examined significant inequalities in health indicators and social health determinants between the Occupied Palestinian Territories and Israel. The report highlights the gaps in the standard of living between a resident of Israel, including the settlements residents in the West Bank and the Palestinian resident in the oPt. The study highlights different aspects of the inequalities existing. For instance, the human development index for the Palestinian Territories was 0.708, while Israel HDI reached 0.919 in 2019 based on the World Bank data. Furthermore, access to clean water is remarkably disproportionate between the oPt and Israel. where, access to clean, accessible, and affordable water remains a challenge in the oPt. In addition, the maternal mortality rate is fourfold higher in the oPt than in Israel, with a difference between the rates of the West Bank and Gaza against 26.3 and 29.9 respectively.

A relatively limited number of studies investigated inequality in access to maternal and child healthcare in Palestine. Krafft & El-Kogali (2014) examined early childhood development inequalities in several countries in the MENA region incorporating the WB and Gaza strip. Using the 2006 National Health Survey data. employing the dissimilarity index (de Barros et al., 2009) the study scrutinizes several circumstances' role in children's access to different opportunities and decompose the inequality, referring to the Shapley decomposition approach (Shorrocks, 2013). The study indicates that a number of circumstances influence inequality across different indicators. For instance, Mother's education has a share of 41.8% in inequality in access to basic care and education, in the West Bank and Gaza. Additionally, considering region as a high substantial driver of inequality in the country.

Hlasny (2016) measures the progress of ECD opportunities under the ongoing Israeli occupation of Palestine, covering different governorates in the country, which are undergoing different security measures and restrictions imposed by the Israeli occupation. Using demographic surveys throughout 1995 until 2014, covering the period 1995, 2004, 2006, 2010 and 2014. The author includes 15 ECD indicators under three categories*, pre-school cognitive development, access to health, and nutrition*. To better understand the implications of the

socio-economic circumstances influencing Palestinian children development. The study finds that Palestine ECD rates are high rates compared to other Arab countries, especially for the immunization rates and access to iodized salt. Yet a few indicators demonstrate a high inequality among demographic groups, namely, in prenatal care, stunting rates, and engagement rates in preschool activities, with most importantly child mortality.

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Despite the systematic health inequalities persisting in the oPt, due to different political and socioeconomic conditions exists. And in spite of the high rates of infant and under-five mortality. However, little research has been devoted so far to study access to maternal and child healthcare inequalities. To my knowledge, no other paper has studied the Human Opportunity Index in the oPt, to address the existing gap in the literature we employ the use of HOI and the Shapley decomposition to measure the contribution of a number of independent variables affecting access to maternal and child healthcare services. In our study, we aim to measure inequality of opportunity utilizing HOI and then decompose the contribution of several socio-economic circumstances affecting maternal and child healthcare inequality in Palestine. Therefore, this study seeks to provide richer insights and results into the subject of inequality in access in oPt employing the 2014 MICS survey data.

CHAPTER III. DATA & METHODOLOGY

3.1. Data Source and Sample Design

The data used in this research was obtained from the most recent Multiple Indicator Cluster Survey (MICS) Programme, which is an international household survey program developed by UNICEF in 1990. This program aims to provide technical assistance to countries in order to collect internationally comparable data with comprehensive indicators, which are adapted to reflect the needs of each country. The MICS programme has progressively reflected varying population needs by identifying suitable indicators on the Country-level and global through innovative sampling and questionnaire approaches. Among other things, the MICS provides:

- Household Questionnaire (Household listing Education Water and sanitation)

- Individual Woman's Questionnaire (Woman's background, Child mortality, Desire for last birth, New-born health (omission of maternal health indicators, Illness symptoms, Contraception, Unmet need, Marriage/union, Sexual behaviour, HIV and AIDS).

- Children under 5 (Age, Breastfeeding, Care of illness, Immunization)- data to evaluate the Millennium Development Goals (MDGs) and monitor the Sustainable Development Goals (SDGs) (UNICEF, 2015).

The Palestinian Multiple Indicator Cluster Survey was carried out in 2014 to develop a representative sample of Palestine. The survey was intended as a multi- step cluster sample covering the whole country counting two geographic regions; The West Bank which consist of 11 governorates: (Jenin, Tubas, Tulkarm, Qalqiliya, Salfit, Nablus, Ramallah and Al Bireh, Jerusalem, Jericho and Al Aghwar, Bethlehem, Hebron) and Gaza Strip which consist of 5 governorates (Gaza, Khan Yunis, Rafah, Deir El Balah and North Gaza) and was stratified according to urban, rural and camp areas.

The survey covered three questionnaires: household demographic information, women between the ages of 15 and 49, and children under five years. Interviews were effectively conducted in 10,182 households, and 13,964 (age 15 to 49) eligible women were identified, 13,367 were successfully interviewed which corresponds to a response rate 95.7 per cent, within the interviewed households 7,816 completed questionnaires for children under five. The MICS conducted in 2014 concerned a sample size of 11,125 households. It is a representative survey of the population which provides detailed information on representatives at the national level, for both urban, rural areas and camp areas and at the level of sixteen provinces of the country.

3.2. Methodology:

3.2.1. Selection of Dependent Variables

The selection of dependent and independent variables is based on the analysis of the literature review provided in the previous chapter. Precisely, in this research, the dependent variable is represented by access to healthcare for mothers and children. The variable drives from a composite variable which will include the following variables: birth taking place at a health facility, whether the birth attended by a skilled professional, if antennal care received, postnatal check-up received by the child and postnatal check-up received by the mothers. Access to healthcare for children will be a *binary variable* that takes a value of 1 if all above circumstances are fulfilled and 0 if not. Computation of HOI is also performed for each explicit healthcare outcome chosen for the composite indicator of access to healthcare. (Thakare & Di Novi , 2020)

1. *Birth taking place at a health facility:*

Maternal mortality is one of the key health challenges in developing countries. Access to decent quality obstetrical care is necessary to reach the target set by SDGs to reduce maternal mortality and to reduce child mortality. Berhan & Berhan (2014) indicate that the low proportion of health facility delivery in developing countries is one of the main obstacles faced for achieving the Millennium Development Goal number 5 for reducing maternal mortality by 75% before 2015. Ronsmans et al. (2006) explain that if the interventions for treating pregnancy and birth complications were accessible equally for every woman more than 80% of maternal deaths worldwide that result from both direct and indirect obstetric complications are preventable or treatable. Nevertheless, several reasons prevent a lot of women from seeking birth care in health amenities, such as lack of maternal education, parents' education level, and regional disparities in access to health facilities, especially between rural and the urban areas. In addition, poor quality of birth care services provided by health facilities is a direct result of inadequate health infrastructure, shortage in the number of nurses and midwives as well as lack of equipment supplies, insufficient provision of blood for the blood banks and drugs.

The variable has been used in studies by Sanoussi et al. (2020) in sub-Saharan Africa; Thakare & Di Novi (2020) ; and Amara & Jemmali (2017) studied inequality of opportunities in early childhood health and nutrition in Tunisia. As well as Tsawe & Susuman (2019), The study examined the inequality of opportunity in the use of maternal and reproductive health care in Sierra Leone. The importance of this variable is that access to timely and competent obstetric care in health institutions may contribute to improved maternal health outcomes and enhance the quality of life for both the mother and child. In our study the responses were considered as institutional deliveries, birth reported at a health facility, including Government hospital, Government clinic/health centre, Private hospital, Private clinic, Private maternity home, NGO's hospital, UNRWA hospital, and Israeli hospital or non-institutional deliveries, including Respondent's home or other homes. The

birth taking place at a health facility variable will be a dummy variable representing 1 for institutional delivery and 0 for non-institutional deliveries.

2. *Birth attended by skilled professional:*

Childbirth attended by a skilled professional is a vital indicator for reducing maternal and neonatal mortality and to reach the SDG 3; improve maternal health. By ensuring timely and effective detection, intervention, and management of complications. Gabrysch & Campbell (2009), indicate that most obstetrical complications close to the delivery period cannot be predicted. Therefore, it is crucial that all pregnant women have access to a professional with midwifery skills, knowledgeable and experienced health professional, working within an enabling environment to ensure a normal delivery supervision at the time of delivery, to prevent stillbirths and to improve the stakes of new-born survival. Nevertheless, child delivery outside health facilities without skilled professional provision is still happening in low- and middle-income countries. (Gabrysch & Campbell, 2009), This variable has been used in studies by Sanoussi et al. (2020) in three countries with low human development index in sub-Saharan Africa, in Tunisia by Amara & Jemmali (2017), in Bangladesh by Thakare & Di Novi (2020) and in Sierra Leone by Tsawe & Susuman (2019).

Responses involving categories with qualified doctors, nurses and midwives were considered skilled professionals for delivery. While responses from traditional birth attendants, relatives, friends, and others or no one were coded as unskilled birth attendance. Generating binary variables for birth being attended by a skilled professional representing 1 and 0 otherwise.

3. *Whether the child received any vaccination:*

Access to life-saving vaccinations is considered one of the most important health service interventions for children, especially in the first five years of life. According to the World Health Organization, vaccine-preventable infections such as pneumonia, diarrhoea and malaria have been the leading cause of childhood mortality, especially in developing countries. Child mortality from such causes can be eliminated with timely access to immunization in early life stages (WHO, 2020). Popova & Palacios (2016) explained some of the barriers to vaccine access among children in developing countries which include effective coverage and reach of vaccinations programs. Predominantly in sub-Saharan Africa and Southern Asia, where over 80 per cent of the 5.2 million under-five deaths in 2019 occurred (WHO, 2020). Children in these two regions are more likely to die before they reach the age of five years than children in developed regions due to preventable and treatable infectious diseases.

The regular immunization variable to protect children from diseases has been used in studies by Sanoussi et al. (2020) in the Democratic Republic of Congo, Guinea Bissau and Mali. And by Amara & Jemmali (2017) in

Tunisia and in Bangladesh by Thakare & Di Novi (2020). In our study, the variable will be a binary variable, denoted 1 as yes for a child receiving any vaccinations and 0 for not receiving any vaccination ever.

4. *Antenatal care or prenatal care (women's routine health control during pregnancy)*

Antenatal care at the health facility is essential for offering women and their family's adequate information and assistance for ensuring a healthy pregnancy, safe childbirth, and postnatal care utilization, for example, care of the newborn through ensuring early and exclusive breastfeeding. When complications occur, ANC may help pregnant women reach health services in a timely manner, in addition to mitigating the effects of preexisting health conditions during pregnancy by providing access to screening and diagnostic services, allowing the endorsement of the use of healthy practices such as attendance of birth by a skilled professional, early postnatal care, in addition to birth planning by ensuring optimal pregnancy spacing, and interpregnancy care (PMNCH, 2006). The WHO recommends at least four antenatal care visits at specified intervals for healthy women with no previous medical complications. Routine antenatal or prenatal care visits might include testing, parental education, and other health checks. The ANC and intrapartum services are usually provided by midwives, general practitioners, or special obstetricians or gynaecologists.

This Variable has been used in studies by Sanoussi et al. (2020) for assessing and decomposing inequalities of opportunity in access to child health in Sub-Saharan Africa, Saidi & Hamdaoui (2017) also used this variable in measuring inequality of opportunity among Tunisian children in access to health services, and Tsawe et al. (2019) used this variable for examining inequality of opportunity in the use of maternal and reproductive health interventions in Sierra Leone. In our study, the binary variable will take a value of 1 as yes for receiving antenatal care and 0 for not receiving antenatal care or prenatal care during pregnancy.

5. *postnatal care received by the mother and the child*

The first six weeks period following childbirth, as defined by the World Health Organization is called the postnatal period, which is considered a critical phase for the lives of mothers and their new-born babies. The majority of maternal and infant deaths happen in the first month after birth. WHO UNICEF (2014) reported that nearly half of the postnatal maternal deaths happened during the first 24 hours after birth and 60 per cent occurred during the first week following birth. High-quality cost-effective care provided for the mother and baby together is essential postnatal interventions carried out by educated and equipped health workers mainly with obstetrician or midwifery skills. This can help prevent complications that affect both the mother and the child. Complications of prematurity intrapartum related to neonatal death, including birth asphyxia and neonatal infections such as pneumonia and diarrhoea can be avoided by providing essential and timely postnatal check-up (WHO, UNICEF., 2014).

This variable has been used in studies by Saidi & Hamdaoui (2017) in Tunisia, Sanoussi et al. (2020) in Democratic Republic of Congo, Guinea Bissau and Mali. In our study, we choose two dummy variables to study mother and child postnatal checkup, if the mother health checked after leaving health facility the variable will denote a value of 1 and 0 otherwise. And the variable for postnatal care received by the baby will take a value of 1 if the baby's health checked after leaving health facility and 0 for other than that.

Table 2.Variables used for Composite Indicator of Healthcare Access

Variables	Type	Empirical Evidence
Birth taking place at a health facility	Dummy (1 = Health facility, 0 = otherwise)	Sanoussi et al. (2020); Amara & Jemmali (2017); Tsawe & Susuman (2019)
Birth attended by a skilled professional:	Dummy (1 = Yes, 0 = No)	Sanoussi et al. (2020); Amara & Jemmali (2017); Tsawe & Susuman (2019)
Whether the child received any vaccination:	Dummy (1 = Yes, 0 = No)	Sanoussi et al. (2020); Amara & Jemmali (2017)
Antenatal care or prenatal care (women's routine health control during pregnancy)	Dummy (1 = Yes, 0 = No)	Sanoussi et al. (2020); Amara & Jemmali (2017); Tsawe & Susuman (2019)
Postnatal care received by the mother and the child	Dummy (1 = Yes, 0 = No)	Sanoussi et al. (2020); Amara & Jemmali (2017)

3.2.2. Selection of Circumstance Variables

This study identifies a set of circumstances variables that are beyond the control of children and may affect a child's access to basic health care services, we treated these variables as exogenous. In our study nine independent variables were selected based on the existing literature of the Human Opportunity Index HOI, which contributes to the case of access to healthcare services among children and grouped these variables into five categories as follows:

1. Characteristic of the child:

The gender of the child has been selected as an independent variable for analysing the characteristics of the child. This variable has been used of study the inequality to access to basic health care services among children; in the Middle East and North Africa region by Krafft & El-Kogali (2014); Ersado & Meltem (2014) in Egypt; in Tunisia by Amara & Jemmali (2017); and by Hoyos & Narayan (2012) in 47 countries[8]. . in our study we Compare females to males to examine to what extent the gender of a child could influence his or her access to healthcare opportunities relative to the other exogenous circumstances selected in the study.

2. Parents level of education:

Parents' education includes the mother's and the head of household level of education categorically. Both variables have been used largely per literature review, mother's education as a proxy for circumstances in almost all the works of literature. By Krafft & El-Kogali (2014) in the Middle East and North Africa, MENA; Ersado & Meltem (2014) in Egypt; Krafft (2015) in Jordan; Amara & Jemmali (2017) in Tunisia; and Thakare & Di Novi (2020) in Bangladesh. The existing literature highlights that mother education level has an independent, positive, and strong impact on reducing child morbidity and mortality. In addition, to increase the consumption of health services. (Romaric Bado & Susuman., 2016). Moreover, regions which are categorized by low parents' education level have chances of reducing children's likelihood of receiving appropriate vaccinations (Saidi & Hamdaoui., 2017). In our study, the mother's education is divided into four categories: Primary, Preparatory, Secondary, and higher. And the head of household education variable divided into; None, Basic, Secondary, and higher.

3. Demographic characteristic of the household:

Number of children under the age of five in the households included in this category. This variable is a discrete variable which provides us with an idea about the composition of the rest of the household. In our study, the outcome is divided into three categories: one child, two to, three, and four to six children under the age of five in the household. The variable has been used in studies by Sanoussi et al., (2020); Saidi & Hamdaoui (2017)[9]; Amara & Jemmali (2017); Thakare & Di Novi (2020) and Ersado & Meltem (2014).

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[8] Hoyos & Narayan (2012) applied the decomposition method to examine the inequality of opportunity among children and analyzed how much gender of a child contributes to inequality in access to opportunities that should be available to all children equitably. The study revealed that even if gender is not the dominant factor, it still plays an essential role in influencing access to opportunities among children. For instance, in Burkina Faso, 32 percent of a moderate inequality in immunization against diseases such as measles among 2-year olds was contributed by the gender of the child, almost an equal contribution as the wealth index by 37 percent.

[9] Saidi & Hamdaoui (2017) conclude that the number of children in the Tunisian household in 2012 prevails in explaining the inequality of opportunity in access to prenatal care and blood samples. And prevail that families characterized by

4. Economic attributes:

It includes a wealth index and residence situation. These two variables represent the economic attributes related to a household. Traditionally Inequality is measured by consumption, income, or wealth indicators Barros et al. (2012). Wealth status is considered the strongest circumstance associated with inequality of opportunity in most of the readings. These variables have been used by Sanoussi (2017); Saidi & Hamdaoui (2017); Amara & Jemmali (2017); Thakare & Di Novi (2020); and Ersado & Meltem (2014). In our study, based on the household survey results, the wealth index is divided into five quintiles comprising five categories: i. Poorest, ii. Second, iii. Middle, iv. Fourth, v. and Richest. Data on residence characteristics has been divided into two categories; i. Household Owns Dwelling, ii. A Household doesn't Own a Dwelling.

5. Geographic location:

It comprises the area, governorate, and regions. These three variables represent the geographic location attributes related to a household. The area comprises the urban, rural, and camps area category. Region and governorate variables were included to capture the disparities within the country. There are two categories for the region: The West Bank and Gaza strip. And there are eleven categories for governorates: (Jenin, Tubas, Tulkarm, Qalqiliya, Salfit, Nablus, Ramallah and Al Bireh, Jerusalem, Jericho and Al Aghwar, Bethlehem, Hebron) within the west bank region and five governorates (Gaza, Khan Yunis, Rafah, Deir El Balah and North Gaza) in the Gaza Strip region. These variables used by Ersado & Meltem (2014); Thakare & Di Novi (2020); Newman (2012); and Romaric Bado & Susuman (2016). These variables have been largely used as the proxy for circumstances in the readings to capture spatial disparities, for instance, unequal provision of government services across different regions could contribute to geographic differences. However, all children should have equal access to the same opportunities independently of where they live.

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several children and older head's households are more likely to suffer from health problems in the whole territory. These conclusions are supported by the results of the logit model regression.

Table 3. Independent Variables

Variables	Type	Empirical Evidence
Characteristic of Child: To capture one direct form of discrimination		
Gender of child	**Categorical** (1=Male, 2=Female)	Amara & Jemmali, (2017); Krafft & El-Kogali, (2014); Ersado & Meltem, (2014); Hoyos & Narayan, (2012); and Thakare & Di Novi (2020)
Parents level of education: to capture socioeconomic origin		
Mother's education	**Categorical:** Primary, Preparatory, Secondary, and higher	(Krafft et al., 2014); Amara & Jemmali, (2017); Ersado & Meltem, (2014) and Thakare & Di Novi (2020).
head of household education	**Categorical:** None, Basic, Secondary, and higher	(Krafft et al., 2014); Saidi & Hamdaoui, (2017);
Demographic characteristics of household: to capture the dependency ratio		
Number of children under 5 in the household	**Discrete**	Sanoussi et al.,(2020); Saidi & Hamdaoui,(2017); Amara & Jemmali, (2017); Thakare & Di Novi (2020); and Ersado & Meltem , (2014).
Economic Attributes: to capture availability of resources		
Wealth Index	**Categorical** (i. Poorest, ii. Second, iii. Middle, iv. Fourth, v. Richest)	(Krafft et al., 2014); Saidi & Hamdaoui, (2017); Amara & Jemmali, (2017); Thakare & Di Novi (2020); and Ersado & Meltem, (2014).
Residence	**Categorical** (Household Owns Dwelling, ii. A Household doesn't Own a Dwelling.)	Saidi & Hamdaoui, (2017);
Geographic characteristic of the household: to capture spatial disparities		
Area	**Categorical:** urban, rural and refugee camps	Krafft et al., (2014): Amara & Jemmali, (2017); and Thakare & Di Novi (2020)
Governorate	**Categorical:** Jenin, Tubas, Tulkarm, Qalqiliya, Salfit, Nablus, Ramallah and Al Bireh, Jerusalem, Jericho and Al Aghwar, Bethlehem, Hebron, Gaza, Khan Yunis, Rafah, Deir El Balah and North Gaza	Ersado & Meltem, (2014).
Region	**Categorical:** The West Bank and Gaza strip	(Krafft et al., 2014); Amara & Jemmali, (2017)

3.3. Econometric Framework

3.3.1. Implementation of HOI Approach

This section seeks to describe the Human Opportunity Index HOI and the necessary steps needed for the construction of the index for access to maternal and child healthcare services in Palestine using data from the Multiple Indicator Cluster Survey (MICS) 2014. The Human Opportunity Index HOI is a composite indicator which was first applied in Latin America and Caribbean by the World Bank (2008), proposed by Barros et al. (2009). The Human Opportunity Index HOI is an effective measure of society's progress in providing equitable opportunities for all children, which can serve as an instrument to support equalizing opportunity through public policy. The index is applied to discrete outcomes and comprises of two main components:

1. The overall coverage rate of the opportunity (C).

2. The degree to which the opportunity is conditional on exogenous circumstances to children such as gender, wealth index and geographic location (D-Index). (Barros et al., 2009).

The dissimilarity index is a measure of inequality of opportunity and estimates how basic opportunities are distributed among society. The index ranges from 0 to 100 in percentage terms, with zero representing the predicament in which society is in the state of perfect equality of opportunity (Barros et al., 2008). As the general interpretation of the dissimilarity index, it represents the fraction of available opportunities which should be redistributed within the population to reach the equilibrium state of perfect equality.

The Human Opportunity Index HOI ranges from 0 to 100. If and when the HOI reaches 100 for a certain country or region, it means that the society has attained the universal coverage of all services whether it is education, health care access, and so on. Barros et al. (2012) interpret Human Opportunity Index HOI as a coverage corrected for equity and suggest that theoretically there is a way to augment the HOI by taking either of the following steps:

1. "Composition effect" through influencing the circumstance variables

2. "The scale effect" by providing more services to the overall population

3. "Equalization effect" through fairer distribution of services

To calculate the Human Opportunity Index, we need to estimate the coverage, by analysing the logit model for a composite indicator access to health as well as other dependent variables, **birth taking place at a health facility, births attended by skilled professional, whether the child received any vaccination, antenatal care or prenatal care (women's routine health control during pregnancy), postnatal care received by the mother and the child.** Let us denote the probability that the person i has access to a certain opportunity, with p_i. According to the theory, the p_i depend on the vector of exogenous independent variables, namely

circumstance variables (name of the independent variables). k denotes the total number of circumstance variables, which will be, hereafter defined as $x_{i1}, x_{i2}, ..., x_{ik}$. For estimating the probability rates p_i for each individual, Barros et al. (2009) introduced the logit model. After reparametrization, as cited by Saidi & Hamdaoui (2017), we will get the following equation:

$$p_i = \frac{exp(\beta_o + \sum_{j=1}^{k} \beta_j x_{ij})}{1 + exp(\beta_o + \sum_{j=1}^{k} \beta_j x_{ij}} \qquad (1)$$

After obtaining the probabilities for each individual, the next step is to calculate the coverage rate $\bar{p}$, which represents the share of the population, having access to a given opportunity. The coverage rate will be measured with the following formula:

$$\bar{p} = \sum_{i=1}^{n} w_i \hat{p}_i \qquad (2)$$

Where, n represents the sample of our analysis and- $w_i = 1/n$, indicating the weights. After obtaining the coverage rate, the following step is constructing a dissimilarity index D, with the following equation:

$$\hat{D} = \frac{1}{2\bar{p}} \sum_{i=1}^{k} w_i |\hat{p}_i - \bar{p}| \qquad (3)$$

Once the coverage rate and dissimilarity index (D-index) are calculated, the final step is to construct a human opportunity index for each dependent and composite dependent variable. Human opportunity index takes into consideration the coverage and dissimilarity but does not emphasize on the origins of inequality itself. The subsequent formula represents the Human Opportunity Index:

$$HOI = \bar{p}(1 - \hat{D}) \qquad (4)$$

3.3.2. Implementation of the Shapley Decomposition

In our study we refer to the Shapley Decomposition method in order to understand how each circumstance contributes of the inequality to access child and maternal health care services. The method was first proposed by Shorrocks (1999) which extends to the idea of the Shapley value of cooperative games theory. The decomposition involves calculating the marginal contribution of each circumstance variable, this is particularly important as the HOI does not provide us with the indication of the scope of impact that each circumstance variable might have on inequality in access to child and maternal health care services Saidi & Hamdaoui (2017).

A number of studies which utilized the Human Opportunity Index have used the Shapley Decomposition method. This method was employed with relevance to healthcare access and HOI, by Amara et al. (2017) in

Tunisia; Sanoussi et al. (2020) in the Democratic Republic of Congo, Guinea Bissau and Mali.; Krafft et al. (2014) in the Middle East and North Africa and Saidi & Hamdaoui, (2017) in Tunisia. To capture the marginal contribution of each circumstance towards inequality.

The notion behind calculating the Shapley Decomposition index is that we measure the marginal contribution for each circumstance variable by gradually and sequentially removing each of them. As Barros et al. (2009, 2012), formulated inequality of opportunity can be measured by the dissimilarity index as already defined by formula (2) and (3). One interesting aspect of the coverage rate p and dissimilarity index D is that increasing the number of circumstance variables included in the model adds to the value of P and D. Therefore, if we have two circumstance variables in one case, namely x_{i1}, x_{i2} and only one circumstance variable in the other case x_{i1}, the following will be true: $D(x_{i1}, x_{i2}) \geq D(x_{i1})$. On the contrary, the opposite is true for the Human Opportunity Index, meaning that the greater the number of variables, the smaller the HOI gets. Following this logic, the impact of adding extra circumstance variables x_{i1} will be:

$$[D(s\{x_{i1}\} - D(S))] \qquad (5)$$

Inequality for a particular circumstance variable x_{i1} will be measured using the following equation:

$$D_{x_{i1}} = \sum_{S \subseteq N\{x_{i1}\}} \frac{|s|! \, (n - |S| - 1)!}{n!} [D(S \cup \{x_{i1}\}) - D(S)] \qquad (6)$$

Where N represents a set of all circumstance variables, which in total includes n circumstances. S, on the other hand, is a subset of N after exclusion of certain circumstance variable x_{i1}. D(S) is the dissimilarity index constructed for all the variables except for x_{i1}, while $D(S \cup \{x_{i1}\})$ is the dissimilarity index measured for both subset S and the circumstance variable x_{i1}. The contribution of x_{i1} circumstance of the dissimilarity index will be measured by the following formula:

$$M_A = \frac{D_A}{D(N)} \; Where \sum_{i \in N} M_i = 1 \qquad (7)$$

To compute the Human Opportunity Index proposed by Barros et al. (2008) using STATA software we executed the following commands: **hoi** and **hoishapley**, which allows us to measure the inequality and estimate the marginal contribution of each circumstance to inequality. Pedro Azevedo et al. (2010) developed the **HOI** STATA command, whilst Suarez. (2013) developed the **hoishapley** STATA module. In this study, we calculated the decomposition index for each outcome variable against the set of circumstance variables (gender of the child; mother level of education; head of household level of education, number of children in the household; region; area; governorate; wealth index and residence) to better capture the socio-demographic characteristics linkages to inequality across children of different circumstances.

CHAPTER IV. RESULTS & DISCUSSIONS

This chapter discusses the main findings obtained from this dissertation. It starts with presenting the descriptive statistics, proceeds with the results generated from the regression model and the Human Opportunity Index, followed by the decomposition of the inequality index.

4.1. Descriptive Statistics

Before starting the analysis, which relies on the Human Opportunity Index, in the following we will describe the steps that have been used for data management. The variables of interest in this study were collected from different datasets within the Palestinian Multiple Indicator Cluster Survey MIC 2014, namely, *Women, Housing, and Children Under the Age of Five.* That is why merging of the three datasets was necessary. After merging the datasets using the common ID variables (Household Number and Cluster Number) and after correcting for the missing values, the sample includes 3521 observations. In order to explain the population and make inferences about it, sample weighting is a necessary step for estimating the population's totals. The sample weights used in the analysis are already provided in the Palestinian MIC survey.

For general understanding of our outcome variable we constructed- **Table 4**. As we have already defined in the methodology, part, coverage rate represents the population which has access to a given health outcome. We have a composite indicator, Access to health care which combines all the health care outcomes in this study. The coverage rate for the Access to Healthcare is 47.23 percent of the sample population has access to all the forms of health care services. Birth attended by a skilled professional and provision of antenatal care share similar results in terms of coverage which amounts to 99.12 and 99.2 respectively. 50.38 percent of the women in the sample population have access to postnatal care check-ups, while this rate amounts to 80.21 for children. If we look at the descriptive statistics for birth at a healthcare facility, we see that the mean is 1, which means that all 3521 observations during the birth was given at healthcare facility (Government hospitals; Government clinics/health centres; Private hospitals; Private clinics; Private maternity; NGO's hospitals; UNRWA hospitals; and Israeli hospitals). Because 100 percent of the observed population have full access to this healthcare outcome, we decided to drop the variable "*health_birth_facility*" due to its irrelevancy. In addition, due to the almost full coverage of vaccination rates, we excluded the "*if Ever_vaccinated*" variable.

Table 4. Descriptive statistics for outcome variables

Outcome	Number of Observation	Mean	Variance	Standard Deviation	Coverage
Access to Healthcare	3521	0.47	0.25	0.5	47.23
Birth at Healthcare Facility	3521	1	0	0	-
Birth Attended by Skilled Professional	3521	0.99	0.01	0.08	99.12
Antenatal Care Received	3521	0.99	0	0.07	99.2
Postnatal Check-up Received by Women	3521	0.5	0.25	0.5	50.38
Postnatal Check-up Received by Children	3521	0.8	0.16	0.4	80.21

After analysing descriptive statistics of the dependent outcomes, **Table 5** will be presenting the descriptive statistics for circumstance variables alongside information about composition of each variable in **Appendix 1.**

1. **Parent level of education:** Parent level of education includes two circumstance variables: Mother's level of education, and education of the household head. According to **Appendix 1**, a higher proportion of mothers have finished either secondary (42.72%) or higher level of education (39.69%). In case of household head education, the highest level of education attained by the household head is basic (39.48%). Additionally, (31.77%) have finished higher education. An interesting aspect of mother's education is that the higher level of education the mother has attained leads to the higher rate of access for overall health care and postnatal checkup for children. We can observe this trend also with household head education with an extension on postnatal checkup received by women.

2. **Demographic characteristics of household**: the demographic characteristic of the household includes children under the age of five in the household. The most common scenarios seem to be households with two to three children (72.08%), followed by households with one child (23.06%). Only (4.86%) of the households have four to six children. According to **Table 5,** the higher number of children in the household is associated with higher access to healthcare outcomes. As is the case for mostly all circumstance variables, for this variable despite the number of children, the highest rate is access to skilled professionals and antenatal care, and the lowest for the postnatal check-ups received by women.

3. **Economic Attributes**: The economic attributes include Wealth Index and Residence. It is evident from Appendix 1, that the highest share of sample population is concentrated among the bottom two quantiles, with 29.79% of people being among poorest and 27.60% being among the second quantile.

On the contrary, the least share population is concentrated in the richest (14.415%). Among the poorest, the least accessible is the postnatal checkup received by women and access to health care composite indicator. The same outcome variables seem to be the least accessible among the richest 20%. 76.77% have their own dwelling while the remaining 23.23% percent, either pays rent or live in a house that doesn't belong to them.

4. **Demographic characteristic of the household**: The demographic characteristics of the household include area, governorate, and region. 54.13% of the sampled population live in Gaza strip, while 45.87% live in the West Bank. 77.23% of the sample lives in urban areas, 14.06% lives in rural areas and 8.705% lives in camps. Overall, the sample consists of 16 governorates, among which 11 belong to the Westbank and 5 to Gaza strip. The highest share of population lives in Gaza city (18.55%) and North Gaza (10.58%) and the lowest share of population resides in Tubas (0.67%) and Qalqilya (1.18%). Among the area variables, the lower access to healthcare services is present in rural areas, specifically for access to health care, postnatal health care for women and postnatal checkup for children. In the case of the two regions, people from the Gaza strip seem to have higher access to health care services. On the other hand, access to health care services in the West Bank accounts for 22.9%. Moving on to the Governorate, the bottom three Governorates with the least access to healthcare services are Jericho (13.96%), Hebron (14.94%), Bethlehem (24.0%). The governorates with the highest access to healthcare are Deir El-Balah (85.84%), North Gaza (73.84%), and Gaza city (65.81%).

5. **Characteristics of Child:** The characteristics of the child includes the Gender of the child. 51.12% of the sampled children are male and 40.88% are female. It seems that the gender of the child doesn't make much difference in any of the outcome variables. However, the lowest access seems to be observed in the postnatal care women variable.

Table 5. Coverage of healthcare services based on circumstance variables

Characteristics	Access to Healthcare	Birth Attended by Skilled Professional	Antenatal Care Received	Postnatal Check-up Received by Women	Postnatal Check-up Received by Children
Mother's Level of Education					
Primary	47.57	100	100	54.86	74.84
Preparatory	46.46	99.85	99.11	51.08	74.1
Secondary	48.08	99.12	99.03	50.76	83.09
Higher	49.61	99.4	99.93	52.16	82.88
Education of Household Head					
None	37.33	100	100	37.33	73.87

Basic	47.4	99.32	99.68	50.22	79.77
Secondary	44.16	99.34	98.4	48.26	80.35
Higher	53.84	99.42	100	56.4	84.78
Area					
Urban	50.13	99.4	99.38	52.63	83.37
Rural	35.72	99.04	99.82	41.96	68.75
Camp	54	99.57	99.24	56.83	84.98
Region					
West Bank	26.92	98.99	99.61	31.87	62.68
Gaza Strip	66.68	99.68	99.28	68.13	97.36
Governorate					
Jenin	35.74	100	99.02	40.01	67.67
Tubas	48.17	100	100	48.17	70.43
Tulkarm	27.08	96.34	100	31.18	61.44
Nablus	30.9	100	100	35.76	79.57
Qalqiliya	25.06	100	100	26.77	93.22
Salfit	43.63	100	100	43.63	92.69
Ramallah & Al-Bireh	31.91	99.12	100	35.38	62.47
Jericho and Aghwar	13.96	100	100	18.69	41.16
Jerusalem	27.73	99.56	98.51	32.68	61.27
Bethlehem	24.4	100	100	33.84	46.06
Hebron	14.94	96.97	100	21.61	50.01
North Gaza	73.84	100	100	75.21	93.89
Gaza	65.81	99.89	98.45	67.9	96.34
Deir El-Balah	85.84	99.16	100	86.68	100
Khan Yunis	49.55	99.08	98.94	51.54	98.95
Rafah	62.59	100	100	62.59	100
Wealth Index					
Poorest	68.85	99.72	99.25	70.2	96.88
Second	62.41	99.57	99.2	64.39	93.66
Middle	30.76	99.72	99.16	35.71	69.21
Fourth	29.11	99.61	99.85	33.46	66.02
Richest	31.44	99.81	100	35.69	65.85
Residence					
Household Owns Dwelling	52.92	100	99.06	55.33	83.17
Household doesn't Own Dwelling	47.08	99.17	99.85	50.34	80.93

Children Under the Age of Five Living in the Household					
One Child	44.76	99.39	99.89	48.41	78.93
Two to Three	48.77	99.32	99.25	51.84	81.66
Four to Six	61.04	100	100	61.04	90.34
Gender of the Child					
Male	48.79	99.33	99.42	51.31	82.31
Female	48.07	99.4	99.44	51.69	80.55

Number of observations = 3521

4.3. Human Opportunity Index

Pedro et al. (2010) developed the HOI STATA module that was used to compute the Human Opportunity Index in this study. Ideally all of the nine circumstance variables would be included in the model, if there is no collinearity. Which is why we run the test for checking the correlation between the variables. The correlation test results are reported in **Appendix 2** and indicate that there might be reason evidence for collinearity between the variables governorate and region. To test whether there is a collinearity between these variables, we test for collinearity. The result of the test indicates that the condition number is above 10 and equals 11.21, which in turn is evidence that there is indeed collinearity between these two variables. The next step concerns which circumstance variable to include in this model and which to exclude. For deciding between the variables and reducing the correlation between them, we estimate two sets of logit models, one including region circumstance variable and the other one including governorate variable. Logit models estimated for all outcome variables were significant, irrespective of whether we include the variable region or governorate. However, the results of the link test for model specifications seemed to be in favour of including the variable region in the list of our circumstance variables. The linktest helps us to identify if the model is properly specified. There should be no extra predictors that are statistically significant.

To make sure that our model specification is optimal and doesn't include any errors, we run the Link Test, which generates the linear predicted values (hat) and the square of linear predicted values (hatsq). For model specification to be considered optimal both of the following conditions need to be met: hat statistics need to be significant, and squared linear predicted values need to be statistically insignificant. One of the supporting reasons for removing the variable governorate was that it didn't fulfil both conditions of the Link Test.

Once we remove the governorate, we implement the logit model for all remaining circumstance variables and test for model specification. The results are reported in **Appendix 3.** We can observe the linear predicted values pass the test of significance, while significance is rejected for squared linear predicted values meaning that they don't hold any power for explaining the model. The fact that the logit model fulfils both requirements of the link test, indicates that the choice of variables is correct.

Table 6 highlights the results of logit regression for each dependent variable separately as well as for the composite indicator of access to healthcare. The significance of the models is supported by the chi2. With sedo2 ranging from 0.7375 to 0.02306.

<p align="center">Table 6. Logit Regression results for Healthcare variables</p>

Circumstance Variables	Access to Healthcare	Birth Attended by Skilled Professional	Antenatal Care	Postnatal Care Women	Postnatal Care Child
mother_edu	0.048	-0.123	0.35	-0.023	0.231
	-0.93	-0.42	-1.15	-0.46	-3.69 ***
HH_educ	0.101	0.212	-0.004	0.128	0.029
	(2.15) **	-0.81	-0.01	(2.75) ***	-0.47
area	0.05	-0.015	0.172	0.079	0.047
	-0.9	-0.05	-0.44	-1.43	-0.61
wealth_index	-0.043	-0.379	0.532	-0.042	0.062
	-0.92	-1.49	-1.4	-0.9	-1.06
children_u5	0.001	0.006	0.005	0.001	0.001
	(2.15) **	-0.74	-0.82	-1.29	(1.81) *
region	1.601	0.205	0.333	1.436	3.248
	(12.12) ***	-0.27	-0.34	(11.08) ***	(15.66) ***
gender_child	-0.033	0.127	0.012	0.021	-0.111
	-0.44	-0.31	-0.02	-0.29	-1.17
Residence	-0.187	-	2.314***	-0.153	-0.017
	(2.11) **	-	-4	(1.75) *	-0.14
_cons	-2.937	5.372	2.133	-2.497	-3.738
	(8.39) ***	(2.68) **	-0.86	(7.28) **	(8.01) ***
N	3,521	3,521	3,521	3,521	3,521
Prob> chi2	0.0000	0.1727	0.0004	0.0000	0.0000
Pseudo R2	0.1236	0.0375	0.1323	0.1019	0.2306

<p align="center">* <i>p</i><0.10; ** <i>p</i><0.05; *** <i>p</i><0.01, values in the brackets represent z statistics</p>

Starting from the composite indicator for access to healthcare, circumstance variables that seem to be significantly affecting the access to healthcare variable are education level of household head, children under the age of five living in the household, region, and residence. Additionally, residence is significant at a 1% significant level while other variables are significant at a 5% significance level. Regarding the direction of the impact, the education level of the household head seems to be positively affecting access to healthcare composite indicator, meaning that, that higher level of education attained by the household head increases the probability of having access to healthcare services. Interestingly, the number of children under five living in the household also has a positive impact on access to healthcare. Indicating that more children living in the household means higher access to health opportunities. Region exerts a positive impact on access to healthcare.

For antenatal care, the residence circumstance variable seems to be significant at a 1% significant level. The positive sign of the coefficient of residence indicates that owing a housing property increases the probability of increasing access to antenatal care dependent variables.

Circumstance variables significantly affect the probability of accessing postnatal care in women, including education of household, head region, and residence. Additionally, both household heads' level of education and region have a positive impact on access to postnatal care, and this impact is significant at a 1% significance level.

The significance of the effect of household heads level of education is substituted by the mother's education level in the outcome variable postnatal care in children. Indeed, the highest level of education the mother attains increases the probability of the child receiving regular postnatal check-ups. Negligible but significantly positive impact is observed in the circumstance variable number of children under five living in the household. Another variable significantly affecting the probability of children receiving postnatal check-ups is the variable region.

Overall, by analysing the logit regression we can see that for three outcome variables with the least coverage rate, namely, access to healthcare, postnatal care in women, and postnatal health care in child are one way or the other are affected by the education of the adult of the household, which under two categories: mother's education, and education of the household head. More specifically, mother's education positively affects access to postnatal care in children and education of the household head has a significantly positive impact on postnatal care in women. However, the scope of the impact seems to be stronger for the mother's education. Another circumstance variable we will highlight is the variable region, which is reported to have significantly positive impact on access to health care, access to postnatal care in women, and in children. The extent of the impact of variable region is substantially higher for postnatal care in children.

For analysing the coverage rate, the Dissimilarity Index, and Human Opportunity Index for healthcare outcome variables we consider the visual representation in the **Figure 2.**

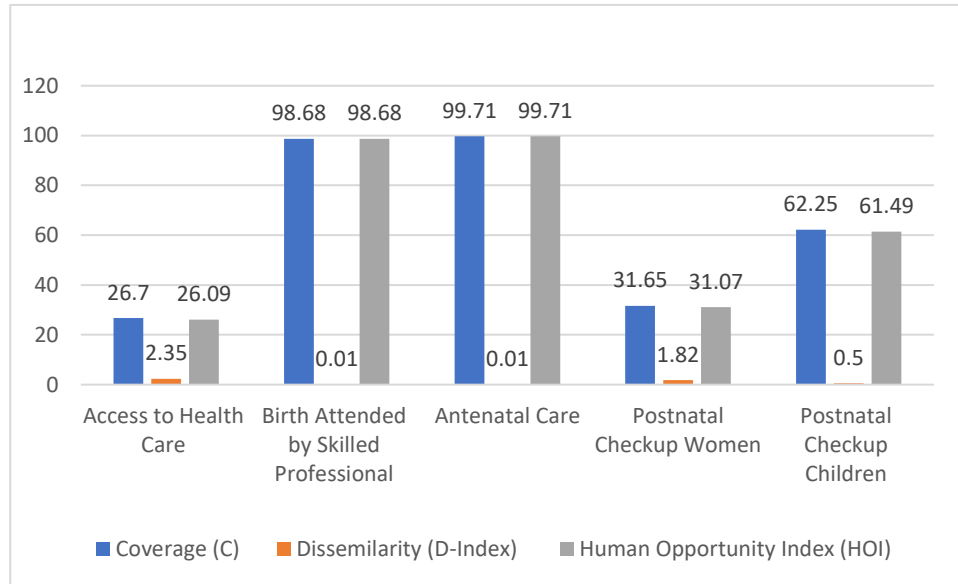Figure 2. Index for the health outcome variables
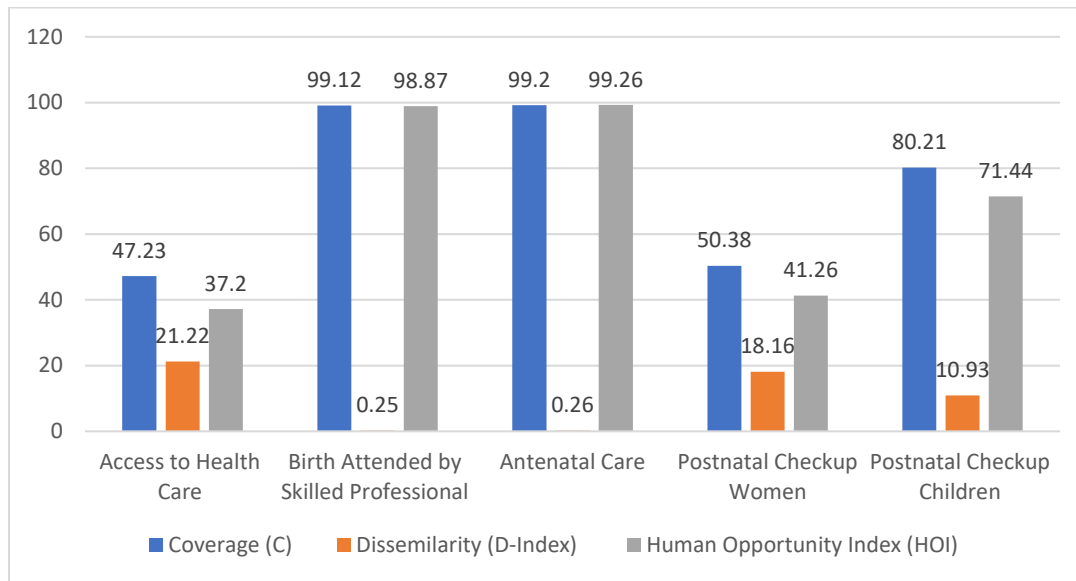
According to **Figure 2**, the coverage rate is the highest for the birth attended by a skilled professional variable and antenatal care variable and equals 99.12 per cent and 99.2 percent respectively, which means that the highest share of the population has access to these health services. Additionally, postnatal checkup seems to be accessible for a larger share of children than mothers, in the sample population. For overall access to health care composite indicator the coverage rate is 47.23 per cent. Now, moving on to the Human Opportunity Index, HOI for access to healthcare equals 37.2, which is below the median level, HOI is also low for postnatal check-up women (41.26%). Among all the variables the lowest inequality exists in the antenatal care and birth attended by a skilled professional with Human Opportunity Index reaching 99.36, and 98.87 respectively.

Region wise Human Opportunity Index presented in **Figure 3 and 4**, gives us an opportunity to compare the indicators for inequality in access to health care services within two regions of the Occupied territories of Palestine: West Bank, and Gaza strip. Major differences emerge within the three health care outcomes, namely, postnatal checkup for women, postnatal checkup for children, and overall access to health care. Before emphasizing on the differences between these variables, first we should remark that the significantly large share of the population in both West Bank and Gaza Strip have access to births attended by skilled professional and antenatal care services, coverage and Human Opportunity index exceeds 98% in both regions for both health care outcome variables. For a composite indicator of access to health care services, coverage is much larger for Gaza Strip, which results in a larger Human Opportunity Index for the Gaza Strip (66.69%) compared to West Bank (26.09%). Regarding the remaining two outcome variables, within the West Bank access to postnatal checkup for women is lesser than for children. 31.65% of women in the West Bank have access to postnatal care services, whilst these rates amount to 62.25% in children. Nevertheless, both of these indicators fall behind their correspondent indicators from Gaza Strip in which the coverage rates are 68.26% and 97.37%,

respectively. We shall highlight that the Human Opportunity Index for postnatal care in children (97.22%) exceeds the HOI in postnatal care in women (68.12%).

**Figure 3**. West Bank: Index for the health outcome variables

**Figure 4.** Gaza Strip: Index for the health outcome variables
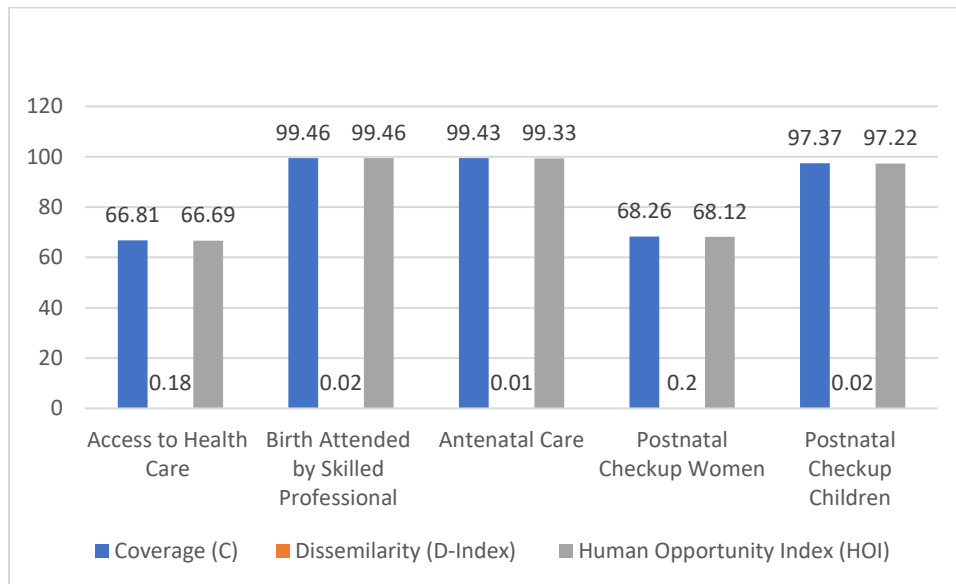
What justifies these surprising differences in access to healthcare services in favour of Gaza strip and why are the rates of access so remarkably high. As we outlined in the demographic peculiarities of oPt, 70% of Gaza population are registered as refugees, allocated within 8 UNRWA registered refugee camps, and exactly through

this agency an integrated humanitarian emergence response services, including healthcare and education are provided by their 22 highly efficient facilities (UNRWA, 2021).
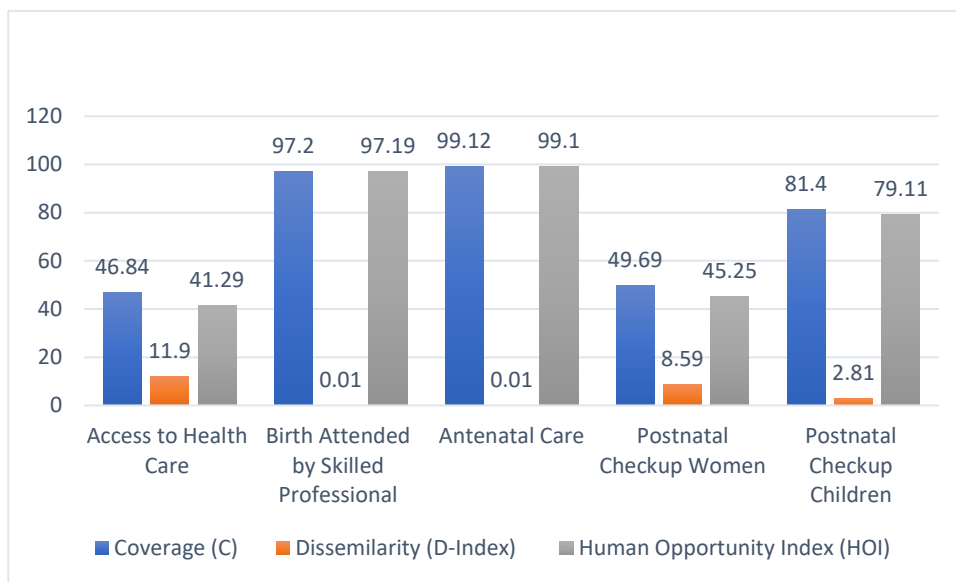
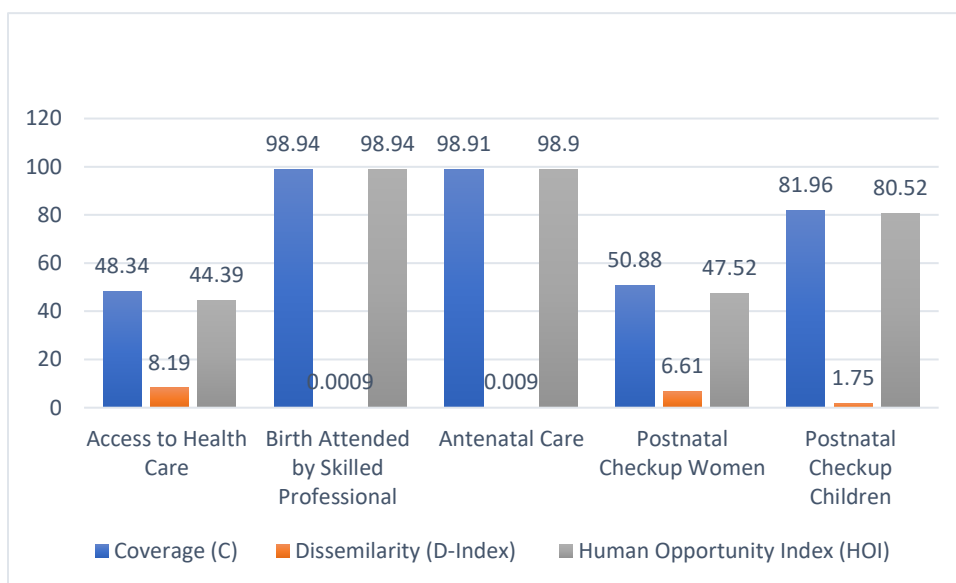**Figure 5**. Access to Healthcare According to Mother Education: Primary
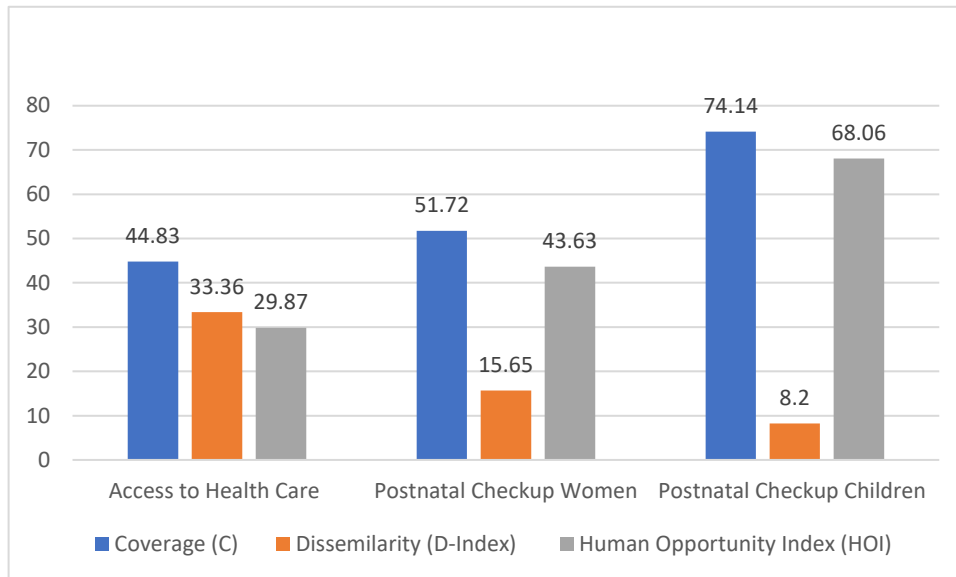
Figure 6. Access to Healthcare According to Mother Education: Preparatory
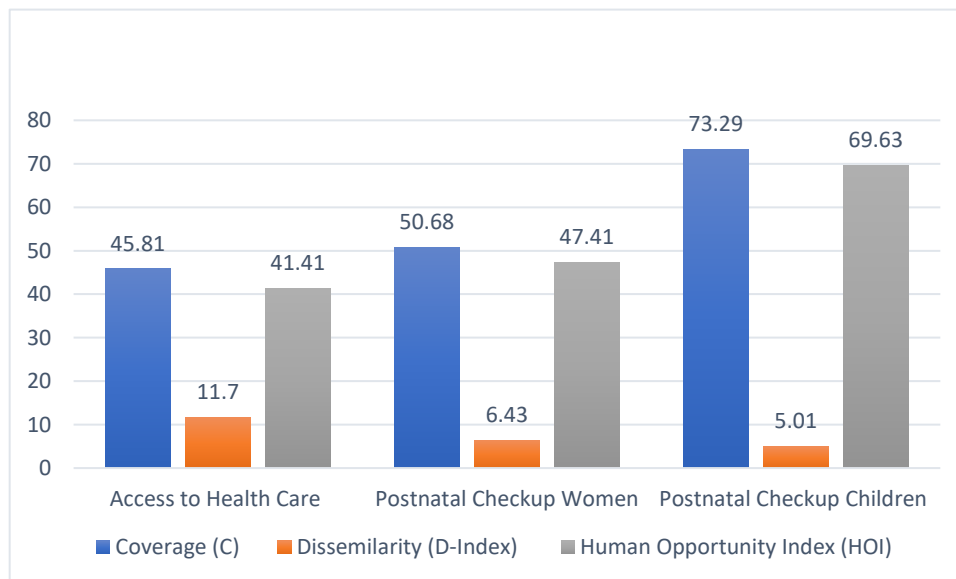
Figure 7. Access to Healthcare According to Mother Education: Secondary

Figure 8. Access to Healthcare According to Mother Education: Higher

Proceeding to measure differences in access to outcome variables in accordance to mother's education level. **Figure 5,6, 7, and 8** display coverage, dissimilarity index and Human Opportunity Index depending on whether the mother attained primary, preparatory, secondary, or higher education. As for the region, we first report results for births attended by a skilled professional and antenatal care. It is noteworthy that neither outcome variables are assessed in case of primary and preparatory level of education of mothers. The reason for this is that STATA did not allow the calculation of Human Opportunity Index due to 100 access to antenatal care services within mothers with primary and preparatory education. Even in the case of completion of secondary

and higher education coverage for the outcome variable, birth attended by a skilled professional and antenatal care almost nears 100 percent. Moving on to the composite indicator of access to health care, the coverage is increasing according to the education level attained by the mother. The lowest share of mothers having access to health care services are the ones with primary education (44.83%) and highest among the mothers with higher education. The Human Opportunity Index is also dominant within mothers with higher education. Regarding access to postnatal care services, irrespective of mother education level, postnatal care seems to be more accessible for children than for women. Nevertheless, the accessibility of postnatal checkup in children is positively affected by mothers educational level, which is highlighted in the Human Opportunity Index statistics, more specifically Human Opportunity Index for postnatal care in children with mothers with primary education equals 68.06% as opposed to the mothers with higher education (80.52%). Share of women with access to postnatal care services does not seem to be experiencing a lot of fluctuations across educational levels. However, hoi is smallest among mothers who only completed primary education (43.73%) and it is highest for mothers who completed higher education (47.52%).

4.4. Decomposition Results

In this study, we decompose inequalities using the Shapley decomposition to measure the contribution of each circumstance as explained in the previous chapter. Hence, for each individual healthcare opportunity and for the composite variable of access to healthcare. Which provides us with the analysis of how each circumstance variable contributes to inequality to establish the policy implications. The results from the decomposition of the d-index are represented in **table 7** below.

Table 7. Results from Shapley Decomposition of D-Index

	Access to health care	Birth Attended by Skilled Professional	Antenatal Care	Postnatal Checkup Women	Postnatal Checkup Children
HOI	0.37	0.991	0.993	0.41	0.71
D-Index	0.21	0.003	0.003	0.18	0.11
Penalty	0.10	0.003	0.003	0.09	0.09
Coverage	0.47	0.993	0.995	0.5	0.8
Mother's Level of Education	0.86	3.03	6.51	0.22	3.13
Household Head Level of Education	3.57	2.4	2.31	4.44	2.95
Area	0.96	0.06	1.76	0.55	1.61
Wealth Index	32.50	26.68	13.95	32.77	29.5
Children Under Five Living in the Household	1.69	5.57	2.85	1.38	1.32
Region	57.39	26.54	8.99	57.65	59.75
Gender of the Child	0.25	1.39	0.44	0.16	0.72

Residence	2.78	34.33	63.19	2.83	1.02

Mother's level of education: as it is reported in **Table 7** mother's level of education is one of the significant contributors of the dissimilarity index. The marginal contribution of this circumstance variable in access to antennal care equals 6.51%. For other individual outcome variables, the contribution of mother's level of education seems to be the lowest for inequality in access to postnatal checkup (0.22%). Regarding the other two outcome variables, namely, birth attended by a skilled professional and postnatal checkup for children, the marginal contribution of mother's education is relatively similar, 3.03% and 3.13% respectively. Regarding the composite indicator of access to healthcare, the level of education attained by mothers explains only 0.86% of inequality in access.

Household head level of education: if we consider the inequality in access to health care as a composite indicator, we see that the household level of education explains 3.57% of inequality which is a larger contribution than that of mother's level of education. Among the individual health care outcomes, the highest share of inequality explained by household head level of education is for postnatal checkup for women. Followed by, the marginal contribution of the household head level of education in access to postnatal checkup in children. This circumstance variable explains the lowest share of inequality for births attended by a skilled professional 2.4% and access to antenatal care (2.31%).

Area: After discussing the importance of the education level of the household head, we move on to the circumstance variable area. The area seems to have a very small marginal contribution for all outcome variables, ranging from 0.06% for births attended by skilled professionals to 1.76% of the contribution to inequality in access to antenatal care. The second highest contribution of the circumstance variable is for inequality in access to postnatal check-up for children (1.61%). Regarding the postnatal check-up for children, the area plays a very insignificant role and accounts for 0.55% of inequality. Moving to the composite indicator of access to health care, overall area seems to be explaining only 0.96% of inequality.

Wealth Index: After discussing the insignificant marginal contribution of the area, we move on to a circumstance variable wealth index. In all aspects of healthcare variable wealth index seems to have a significant contribution, however, for some higher than the other. For a composite indicator of access to healthcare, 32.50% of the overall inequality in access is indeed explained by the index of wealth. Regarding other individual healthcare variables, the highest contribution of wealth index is present for postnatal checkup for women (32.77%), followed by inequality in access to postnatal checkup for children (29.5%) and attendance of skilled professionals for birth (26.68%). Finally, wealth index seems to be the least contributing to the inequality in access to antenatal care (13.95%).

Children under five living in the household: If we start the analysis with comparing the marginal contribution of the number of children under 5 living in the household with the contributions of other circumstance variables, **Table 7** reports that explains the higher percentage of inequality in access then gender of a child and area. Overall, the number of children living in the household explains 1.69% of inequality in access to composite health outcomes, access to healthcare services. Regarding other individual healthcare variables, the number of children under 5 living in the household seems to have the highest contribution in the inequality of access to birth attended by a skilled professional (5.57%), followed by antenatal care (2.85%). Number of children under 5 living in the household explains a rather insignificant share of inequality in access to postnatal care for women and children, 1.38% and 1.32%, respectively.
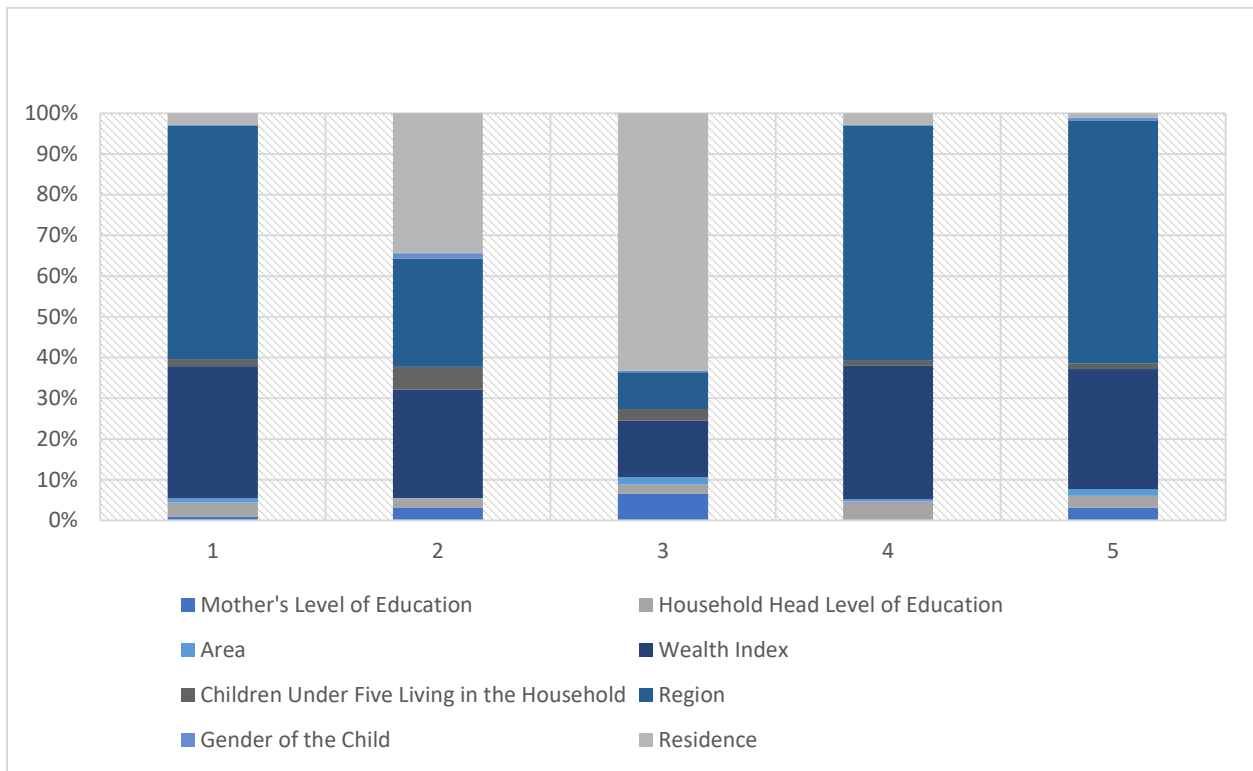
Region: Of all the significant contributors in inequality in access to healthcare, region is reported to be the highest, explaining 57.39% of inequality in access to healthcare, as a composite indicator. Highest share of inequality explained by variable region, is for the access to postnatal care in children, accounting for 59.75%. 57.65% of inequality in access to postnatal checkup women is explained by the regional circumstance. Region also seems to be contributing significantly to inequality in access to skilled professional attendance during delivery (26.54%). The smallest share of inequality explained by the region is for antenatal care (8.99%). This result matches the findings of Krafft & El-Kogali (2014) that the region is substantial drivers of inequality in the West Bank and Gaza.

Gender of a child: The results table reports the least explanatory power in case of the circumstance variable gender of a child. For the majority of the healthcare outcome variables, the marginal contribution of gender of a child does not seem to be explaining more than 1% of inequality. The only variable, for which its marginal contribution exceeds 1% is in the case of birth attended by a skilled professional (1.39%). This result aligns with Krafft & El-Kogali (2014) findings as Gender did not contribute substantially to inequalities in early childhood.

Residence: The results for the last circumstance variable, residence, indicate the fluctuating contribution for each healthcare outcome. For the composite indicator of access to healthcare, residence explains 2.78% inequality in access. Contribution is also similar for postnatal check-up for women (2.83%) and for children (1.02%). Nevertheless, the contribution gets really high in inequality in access to birth attended by a skilled professional (34.33%) and antenatal care (63.19%), which is also the highest share of inequality explained by whether a household owns the dwelling or not. Results are consistent with Amara & Jemmali (2017) paper reporting that residence causes low inequalities in access to all basic healthcare and nutrition services among children in Tunisia.

Figure 9. Results from Shapley Decomposition of D-Index

Legend:
- Mother's Level of Education
- Household Head Level of Education
- Area
- Wealth Index
- Children Under Five Living in the Household
- Region
- Gender of the Child
- Residence

CHAPTER V. POLICY IMPLICATIONS AND CONCLUSION

5.1. Conclusions & Recommendations

The current study focused on examining the level of equity in access to maternal and child healthcare services among children and mothers in the Occupied Palestinian Territories. In addition, this study aimed to decompose the determinants of inequality in access to these basic services, in order to address a specific intervention to enhance the health status among the targeted sample. Drawing on the last wave of the MICS surveys at the time of analysis, we referred to the 2014 MICS. This study applied the Human Opportunity Index (HOI) methodology which was initially developed by the World Bank. In order to overcome the limitation of the HOI approach, the study utilized the Shapley Decomposition method proposed by Shorrocks (1999) to calculate the marginal contribution of each circumstance variable in inequality of access to basic services. Hence, this step has substantial significance for the overall study results, as the HOI did not provide us with the indication of the scope of impact that each circumstance variable have on inequality in access to child and maternal health care services.

Based on a set of nine independent circumstance variables selected in this paper, which are entirely beyond the control of children, this paper has shown that, Palestinian maternal and childcare faces unequal opportunities in terms of healthcare access. Furthermore, we found that Parents level of education, wealth, and geographic factors are key aspects determining unequal access to healthcare services. Despite the sufficiently high rates of access to birth attended by skilled professionals and Antenatal care, The HOI is still below average mirroring the low rates of access to prenatal healthcare services for both mothers and children. Therefore, the applied methodology and results obtained from this study provide us with a practical and analytical tool for policy analysis, to implement a proper reference to achieve progress in eliminating inequities in circumstances and opportunities for children.

Surprisingly, the study uncovered that the coverage rate for overall healthcare services was higher in the Gaza strip compared to the West Bank, and therefore it is associated with lower rates of dissimilarity index and higher rates of Human Opportunity Index. The results were justified by the existence of UNRWA facilities within Gaza strip and high marginal share of refugees (70%) among whole population.

Inadequate level of parents' education contributes to higher inequalities, more specifically the circumstance variable "mother's education" indicates that the higher level of education attained by mother leads to the corresponding higher rate of access for overall healthcare services. In the long term, for overall consistency and sustainability of the results, it is recommended that in order to improve the overall maternal and child healthcare access, the government should reform the education system by implementing a vigorous educational campaign,

ensuring the maximum rates of graduation from all four levels of school education, including primary, preparatory, secondary and most importantly higher level of education for not only girls but both genders, because our results also indicate the significant marginal contribution of HH head education, for which the gender is ambiguous.

In addition, there is a necessity to introduce maternal studies and therefore increase the community awareness of the importance of prenatal and postnatal care provision in improving the overall healthcare access and reducing maternal and infant mortality rates. This sort of awareness campaigns could be integrated within school curriculums, and given by highly professional individuals, equipped with necessary knowledge and capacity to deliver the information with consideration of social context.

Furthermore, to reduce the inequality of access to services across the two regions, prompted by geographic differences, it is recommended, among other things, to advance the socio-economic circumstances of the people through poverty reduction and through better targeting medical assistance. This could be achieved by introducing a new policy to diminish social and regional inequalities in access to health services.

References

Amara , M., & Jemmali, H. (2017). On the Decomposition and Dynamics of Inequality of Opportunities: A Special Focus on Early Childhood Health and Nutrition in Tunisia. *The Economic Research Forum (ERF): Working Paper 1093.*

Partnership for Maternal, Newborn & Child Health. (2006). *Opportunities for Africa's Newborns Practical data, policy and programmatic support for newborn care in Africa.* WHO on behalf of The Partnership for Maternal Newborn and Child Health.

World Health Organization, UNICEF. (2014). *Every Newborn: an action plan to end preventable deaths: Executive summary.* . Geneva: World Health Organization.

Aday, L. (1976). The Impact of Health Policy on Access to Medical Care. *Milbank Memorial Fund Quarterly/Health and Society*, 215-33.

Aday, R. A. (1978). Access to Medical Care in the U.S.: Realized and Potential. *Medical Care*, 533-546 .

Anwar, I. S. (2018). *Inequity in maternal health-care services: evidence from home-based skilled-birth-attendant programmes in Bangladesh.*

Assaad, R., Krafft, C., Belhaj Hassin, N., & Salehi-Isfahani, D. (2012). INEQUALITY OF OPPORTUNITY IN CHILD HEALTH IN THE ARAB WORLD AND TURKEY. *The Economic Research Forum.*

Atamanov et al. (2018). *West Bank and Gaza Poverty and Shared Prosperity Diagnostic 2011-2017 (English).* Washington, D.C: World Bank Group.

Atamanov et al. (2019). *Poverty Map of the Palestinian Territories : Palestinian Expenditure and Consumption Survey 2016 and Census 2017 (English).* Washington, D.C: World Bank Group.

Barros, A., & al., e. (2012). Equity in maternal, newborn, and child health interventions in Countdown to 2015: a retrospective review of survey data from 54 countries. *The Lancet.*

Barros, F., Victora, C., Scherpbier, R., & Gwatkin, D. (2010). Socioeconomic inequities in the health and nutrition of children in low/middle income countries. *Rev Saúde Pública.*

Barros, R. P., Molinas Vega, J. R., Chanduvi, J., Giugale, M., & Hasan, A. (2012). *Do Our Children Have a Chance? A Human Opportunity Report for Latin America and the Caribbean* . The World Bank.

Bellieni, C. V. (2016). The Golden 1,000 Days. *Journal of General Practice.*

Berhan, Y., & Berhan, A. (2014). A Meta-Analysis of Socio-Demographic Factors Predicting Birth in Health Facility. *Ethiopian Journal of Health Sciences* .

Carine Ronsmans, Wendy J Graham. (2006). Maternal mortality: who, when, where, and why. *The Lancet* , 1189-1200.

DI MCINTYRE, M. T. (2009). Access as a policy-relevant concept in low- and middle-income countries. *Health Economics, Policy and Law* , 179–193.

Dutton, D. B. (1985). Socioeconomic Status and Children's Health. *Medical Care*, 142-156.

Ersado, L., & Meltem , A. (2014). *Inequality of Opportunity Among Egyptian Children.* Washington, DC: World Bank Group.

Gabrysch , S., & Campbell, O. (2009). Still too far to walk: literature review of the determinants of delivery service use. *BMC Pregnancy Childbirth.*

Goldsmith, L., & Ricketts, T. (2005). Access in health services research: The battle of the frameworks. *Nursing Outlook*, 274-280.

Guagliardo, M. F. (2004). Spatial accessibility of primary care: concepts, methods and challenges. *International Journal of Health Geographics.*

Hlasny, V. (2016). *State of Children's Development in Palestine in the Face of the Israeli Occupation.* UN ESCWA .

Hlasny, V. (2017). Evolution of opportunities for early childhood development in Arab countries. *International Journal of Human Rights in Healthcare.*

Hoyos , A., & Narayan, A. (2012). *Inequality of opportunities among children: how much does gender matter?*

Human Rights Watch HRW. (2021). *A Threshold Crossed Israeli Authorities and the Crimes of Apartheid and Persecution.* HRW.

Kitagawa, E. a. (1973). *3. Differential Mortality in the United States: A Study in Socioeconomic Epidemiology. .* Cambridge, Mass: Harvard University Press.

Kosa, J. a. (1975). Poverty and Health: A Sociological Analysis. *Cambridge, Mass.: Harvard University Press.*

Krafft & El-Kogali. (2014). Inequalities in Early Childhood Development in the Middle East and North Africa. *The Economic Research Forum (ERF).*

Krafft, C. (2015). The determinants of child health disparities in Jordan. *The Economic Research Forum (ERF).*

Krishnan et al. (2012). *Aspirations on hold? Young lives in the West Bank and Gaza.* Washington, D.C: World Bank Group.

Leone, T., Gutierrez, D., Ghandour, R., Coast, E., & Giacaman, R. (2019). Maternal and child access to care and intensity of conflict in the occupied Palestinian territory: a pseudo-longitudinal analysis (2000–2014). *conflict and health .*

MAP. (2017). *HEALTH UNDER OCCUPATION.* Medical Aid for Palestinians MAP.

MAP. (2021). *Medical Aid for Palestinians.* Retrieved from www.map.org.uk: https://www.map.org.uk/the-issues/the-issues

Minority Rights Group International (MRG). (2011). *briefing Israel's denial of the Bedouin.* Minority Rights Group International (MRG).

Newman, J. (2012). *Human Opportunity Index - National : Equality of Children's Opportunities in Pakistan.* Washington, DC: World Bank.

Niksic et al. (2014). *Area C and the Future of the Palestinian Economy.* WORLD BANK.

OCHA - WHO. (2010). *The Impact of Barrier on Health .* The World Health Organization (WHO), United Nations Office for the Coordination of Humanitarian Affairs OCHA. Retrieved from www.ochaopt.org: https://www.ochaopt.org/theme/west-bank-barrier

Paes de Barros, R., H. G. Ferreira, F., Molinas Vega, J. R., Saavedra Chanduvi, J., De Carvalho, M., Franco, S., . . . Gignoux, J. (2008). *Measuring inequality of opportunities in Latin America and the Caribbean (English).* Washington, D.C: World Bank Group.

Palestinian Central Bureau of Statistics PCBS. (2019, 06 20). *Palestinian Central Bureau of Statistics (PCBS) The International Day Of Refugees*. Retrieved from www.pcbs.gov.ps: http://www.pcbs.gov.ps/site/512/default.aspx?lang=en&ItemID=3486

Pedro Azevedo, J., Franco, S., Rubiano, E., & Hoyos, A. (2010). HOI: Stata module to compute Human Opportunity Index. *Statistical Software Components S457191, Boston College Department of Economics,*.

Physicians for Human Rights. (2015). *Divide and Conquer: Inequality in Health*.

Popova, O., & Palacios, P. (2016). Reaching more children with vaccines in developing countries: key challenges of innovation and delivery. *Current Medical Research and Opinion*.

Roemer, J. E. (1998). *Equality of Opportunity*.

Romaric Bado, A., & Susuman , A. (2016). Women's Education and Health Inequalities in Under-Five Mortality in Selected Sub-Saharan African Countries, 1990–2015. *journals plos*.

Rutherford, M., Mulholland, K., & Hill, P. (2010). How access to health care relates to under-five mortality in sub-Saharan Africa: systematic review. *Tropical Medicine and International Health*, 508–519.

Saidi , A., & Hamdaoui , M. (2017). On measuring and decomposing inequality of opportunity in access to health services among Tunisian children: a new approach for public policy. *Health Qual Life Outcomes*.

Sanchez et al. (NA). *Inequality Of Opportunity Among Children: Measuring Regional Human Opportunity Index In Mindanao*.

Sanoussi. (2017). Measurement and Analysis of Inequality of Opportunity in Access of Maternal and Child health care in Togo. *BMC Health Services Research*.

Sanoussi et al. (2020). Assessing and decomposing inequality of opportunity in access to child health and nutrition in sub-Saharan Africa: evidence from three countries with low human development index. *International Journal for Equity in Health*.

Shorrocks, A. F. (1999). *Decomposition Procedures For Distributional Analysis: A Unified Framework Based on the Shapley Value*.

State of Palestine. (2018). *Palestinian National Voluntary Review on the Implementation of the 2030 Agenda*. United Nations Sustainable Development.

State of Palestine Palestinian Central Bureau of Statistics PCBS . (2020, 7 9). *State of Palestine Palestinian Central Bureau of Statistics PCBS* . Retrieved from pcbs.gov.ps: http://pcbs.gov.ps/site/512/default.aspx?lang=en&ItemID=3774

Suarez, A. H. (2013). HOISHAPLEY: Stata module to perform Shapley Decomposition of the Human Opportunity Index. *Statistical Software Components S457618, Boston College Department of Economics*.

Susan P Walker, T. D. (2007). Child development: risk factors for adverse outcomes in developing countries. *Lancet*, 145-57.

Thakare, H., & Di Novi , C. (2020). Inequality of Opportunity in Accessing Maternal and Newborn Healthcare Services: Evidence from the Bangladesh Demographic and Health Survey.

The United Nations Relief and Works Agency for Palestine Refugees in the Near East UNRWA . (2021). *The United Nations Relief and Works Agency for Palestine Refugees in the Near East Palestine refugees*. Retrieved from www.unrwa.org: https://www.unrwa.org/palestine-refugees

The World Bank . (2012). *Aspirations on hold? Young lives in the West Bank and Gaza.* Washington, D.C: The World Bank Group.

Thomas, R. P. (1981). The Concept of Access: Definition and Relationship to Consumer Satisfaction. *Medical Care.*

Tsawe, M., & Susuman, A. (2019). Examining inequality of opportunity in the use of maternal and reproductive health interventions in Sierra Leone. *Journal of Public Health.*

UNICEF. (2015). *Monitoring the situation of children and women for 20 years. The Multi-Indicator Cluster Surveys (MICS). 1995;2015.*

UNICEF. (2018). *CHILDREN THE STATE OF PALESTINE .* the United Nations Children's Emergency Fund.

WHO. (2013). *Right to health: crossing barriers to access health in the occupied Palestinian territory.* World Health Organization.

World Bank. (2021). *The World Bank Group Data.* Retrieved from data.worldbank.org: https://data.worldbank.org/indicator/SP.POP.GROW?locations=PS&view=chart

World Bank Group. (2011). *West Bank and Gaza - Coping and conflict : poverty and inclusion.* Washington, D.C.

World Health Organization . (2021). *World Health Organization Sustainable Development Goal .* Retrieved from www.who.int: https://www.who.int/topics/sustainable-development-goals/targets/en/

World Health Organization. (2015). *Palestine health profile .*

World Health Organization. (2018). *World health statistics: monitoring health for the SDGs, sustainable development goals.* Geneva.

World Health Organization. (2020, September 8). *World Health Organization.* Retrieved from www.who.int: https://www.who.int/en/news-room/fact-sheets/detail/children-reducing-mortality

Appendices

Appendix 1. descriptive statistics for circumstance variables: composition

Characteristics	Composition	Characteristics	Composition
Mother's Level of Education		Jerusalem	8.542
Primary	3.277	Bethlehem	2.949
Preparatory	13.31	Hebron	9.577
Secondary	42.72	North Gaza	10.58
Higher	39.69	Gaza	18.55
Education of Household Head		Deir El-Balah	7.258
None	1.175	Khan Yunis	9.685
Basic	39.48	Rafah	8.063
Secondary	27.59	**Wealth Index**	
Higher	31.77	Poorest	29.79
Area		Second	20.67
Urban	77.23	Middle	17.91
Rural	14.06	Fourth	17.29
Camp	8.705	Richest	14.41
Region		**Residence**	
West Bank	45.87	Household Owns Dwelling	76.77
Gaza Strip	54.13	Household doesn't Own Dwelling	23.23
Governorate		**Gender of the Child**	
Jenin	5.052	Male	51.12
Tubas	0.6677	Female	48.88
		Children Under the Age of Five Living in the Household	
Tulkarm	2.292	One Child	23.06
Nablus	6.606	Two to Three	72.08
Qalqiliya	1.18	Four to Six	4.86
Salfit	1.502		
Ramallah & Al-Bireh	5.781		
Jericho and Aghwar	1.719		

	Mother's Level of Education	Household Head Level of Education	Area	Wealth Index	Children Under Five Living in the Household	Region	Gender of the Child	Residence	Governorate
Mother's Level of Education	1.000								
Household Head Level of Education	0.387	1.000							
Area	-0.387	-0.029	1.000						
Wealth Index	0.161	0.105	0.005	1.000					
Children Under Five Living in the Household	-0.085	-0.118	0.014	-0.104	1.000				
Region	-0.006	0.063	-0.105	-0.808	0.076	1.000			
Gender of the Child	0.002	0.032	-0.020	0.032	0.033	-0.005	1.000		
Residence	-0.046	-0.072	0.075	0.076	0.180	-0.055	-0.014	1.000	
Governorate	0.002	0.047	-0.127	-0.617	0.014	0.799	0.011	-0.061	1.000