The Causal Effect of Free Health Insurance Policy on the Well-Being and Health Care Utilisation of Jordanian Children

Ayse Yaylali

Economics, University of Strathclyde, Glasgow, UK

Email address:

aysheyaylali@hotmail.com

Abstract: The provision of free health insurance can be considered as an essential step towards achieving Universal Health Coverage which is one of the Sustainable Development Goals defined by the United Nations. To achieve Universal Health Coverage, Jordan made the health insurance free for the children under the age of six in year 2002. The children lose the free health insurance eligibility on their seventh birthday. This health insurance policy provides eligible children with free health care at any hospital or health center embodied by the Ministry of Health. The paper estimates the causal effect of the Jordanian government's free health insurance policy, which covers children under the age of six, on children's health care utilisation, well-being, and development. To understand the causal impact of the policy on children's well-being and health utilization behavior the paper employs the age-related Regression Discontinuity Design and uses 2017 Jordan Demographic Health Survey data. The results suggest that children under age six are 17 percentage points more likely to be insured. The increase in insurance coverage leads to more frequent hospital visits, a preference for private hospitals and an improvement in children's well-being. Although one might expect that health care spending would be significantly lower in the treatment group, the policy does not have a significant impact on health care spending. This can be explained by the fact that this group prefers to use private health care services in addition to public health care services due to the inefficient public health care system.

Keywords: Free Health Insurance Policy, Health Care Utilisation, Effectiveness

1. Introduction

Access to health care at an early age is essential for children's development, future health, and well-being. There is an urgent need to examine the impact of health insurance policies on facilitating access to health care to achieve desired health outcomes. Millennium Development Goals (MDGs) 4, 5 and 6 address the importance of health care. MDG 4 aims to reduce child mortality by at least two-thirds, MDG 5 focuses on improving maternal health, and MDG 6 calls for action to eliminate HIV/AIDS and epidemics such as malaria. Sustainable Development Goal (SDG) 3 ensures the health and well-being of people of all ages. SDG target 3.8 highlights the need for UHC to ensure that people and communities have access to quality health services without risking financial hardship. In line with the MDGs and SDGs, many low- and middle-income countries have adopted UHC policies to enable low-income households to access health services [13]. Continuous review and improvement of government health care systems are critical to the well-being of society in the face of changing demographics, the risk of epidemics and pandemics, and rising health care costs. Undoubtedly, children under the age of five are the most vulnerable group, as any health problem that occurs in the early stages of life can lead to lasting problems that have a negative impact on children's development later on [36].

Children's lack of access to health care is mainly attributed to poverty or not having health insurance. A growing line of the literature emphasizes the importance of school children's access to health care. The goal of UHC policies is to mitigate financial barriers to accessing health services, protect vulnerable populations by ensuring coverage for the entire population, and provide the full range of health services

needed. UHC primarily aims to ensure adequate access to prenatal and postnatal care, assisted deliveries and caesarean sections, as well as health services for children and the elderly above a certain age.

These services are chosen to primarily protect the poor and vulnerable segments of the population [29]. UHC policies are particularly well suited to low- and Middle-Income Countries (LMICs) and are being adopted by many of these countries to make progress on the SDGs. The Jordanian government is committed to further improving health services to make them accessible to all citizens. One of the most important initiatives of the Jordanian government is related to the implementation of the Civil Health Insurance Plan (CHIP), which has been in force since 1965 and is continuously updated.

Children in LMICs have particularly limited access to health services [15]. Expanding worldwide consideration is being drawn towards UHC, and health insurance policies play a strategic role in that drive. This paper focuses on the free health insurance coverage provided by the Jordanian government to children under the age of six. In accordance with the framework of CHIP, the government began offering health insurance to all government employees, their dependents, disadvantaged households, and children under the age of six in 2002. The government also subsidises health services that benefit uninsured households [37]. Nevertheless, health care financing is a challenge for Jordan, like the case of every other country. The government reportedly spent 8.7% and 7.5% of GDP on health care in 2016 and 2017 respectively [11]. Jordan has the highest healthcare spending compared to most MENA countries, such as Egypt, Iraq, Kuwait, Oman, Qatar, Saudi Arabia, and Yemen. Jordan also has one of the lowest infant mortality rates in the MENA region with 13.64 deaths per thousand live births [14]. However, this figure still needs improvement. Therefore, free health care for children under the age of six in Jordan is worth exploring to understand the impact of government policies and how these policies can be implemented and monitored to improve their effectiveness.

The paper uses DHS IPUMPS data and employs Regression Discontinuity Design (RDD) to assess the causal impact of free health insurance on health care utilization and developmental outcomes of eligible children. The paper also uses data from the United Nations (UN) sources for analytical background information. Insurance coverage has recently begun to be included in the datasets, hence there are only a few studies that establish a causal relationship between insurance policies and changes in health and health utilisation in developing countries. This paper contributes to the understanding of the effectiveness and weaknesses of free health insurance for children by focusing on an Arab LMIC country and provides insights on how these interventions can be accompanied to lead to better health outcomes by using fuzzy RDD, a robust methodology for analysing the effectiveness of health insurance interventions.

2. Background

2.1. Jordan's Health Profile and Health Insurance Policy

Jordan has one of the most sophisticated and progressive healthcare systems in the Middle East, and remarkable progress has been made because of the health policies implemented and constantly updated since the 1980s. The country has achieved universal health immunisation and made progress in reducing potential health risks for children and maternal mortality. For example, the country has been polio-free since 1995 [39]. The child mortality rate in Jordan is the lowest compared to other MENA countries, and the JDHS 2012 report suggests that the child mortality rate has been decreasing steadily since the 1990s. All types of immunizations are available to 93% of children under the age of two, and 100% of children under the age of six can access all types of health services as they are covered by the national health insurance [27, 8].

Jordan's healthcare system comprises of public/semi-public and private facilities that provide hospitals, primary care clinics, pharmacies, and ancillary services. Since 2018 the Ministry of Health (MoH) and Royal Medical Services (RMS) are mainly responsible for providing health care services to 70% of the population [14]. Jordan University Hospital and Jordan University of Science and Technology Hospital serve 5% of the population. 21% of the population utilises private hospitals, and the remaining 4% uses missionary health services. Table 1 compares public and private hospitals in Jordan. There has been a continuous investment to increase the number of hospitals in the country and it can be seen that private hospitals outnumber the public hospitals.

Table 1. *Number of Hospitals in 2003 & 2007.*

Sector	2003	2007
Ministry of Health	29	31
Royal Medical Services	10	15
Private Sector	56	69
Total	97	117

Source: [19]

The MoH is responsible for regulating and auditing the entire health sector and acts as the leading provider of primary, secondary and tertiary level health services in the public sector (The World Bank, 2017). Almost 80% of the Jordanian population holds insurance with the public sector and the rest is covered by private insurance, United Nations Relief and Works Agency for Palestine Refugees (UNRWA), and other sources [18]. Children under six years of age and citizens who are 60 years old or older are eligible for free insurance in the public health sector. Public sector provision includes the health services of MoH, university hospitals as well as those of the military Royal Medical Services [39]. Free health insurance for children under the age of six is implemented as a part of the health sector reform by Royal Decree. Prior to this reform using public health services was not free for the children under the age of six. The free health insurance reform also

comprises of the civil servants and their dependents as well as poor and disabled individuals [33]. Private insurance in Jordan only reimburses a part of the expenses so using outpatient services would cost around 16.1 Jordanian Dinars with private insurance and 46.2 Dinars for people without insurance. For inpatient care, people without insurance pay around 143.7 Dinars while insured individuals pay only around 32.1 Dinars [2].

One of the main reasons underlying this free insurance policy for children under the age of six is child mortality rates. MDGs 4 and 5 are about improving maternal and child health and reducing mortality. Considerable progress has been made with maternal mortality falling from 523,000 to 289,000 between 1990 and 2013 due to the improvements in Antenatal Care Coverage (ANC) [23]. Such policies play a crucial role in achieving good health outcomes, but it is also important to ensure that all citizens have access to these facilities. Women living in disadvantaged areas of Jordan may be unable to attend antenatal visits to hospitals. Those visits are critical to preventing complications during pregnancy [10]. Between 1990 and 2007, with the help of the free health insurance policy for children under six, neonatal and under-five mortality dropped from 33% to 21% and from 40% to 24%, respectively. [33].

2.2. Policy Background

Jordanian Government is committed to achieving the UHC target, especially for the vulnerable individuals that make up 4.7% of the population. In recent years, the government has extended health insurance coverage to children under the age of six and people over sixty. In addition, citizens residing in low-income neighborhoods are exempt from health fees provided by the MoH [3]. This policy has been in place since 2002, and the citizens must apply for this insurance. Nearly 312,000 children currently benefit from this free health insurance coverage provided by Royal Decree [21, 24].

This policy is an essential instrument to ensure that all children are vaccinated and protected against all types of diseases. Figure 3 illustrates the data from United Nations Inter-agency Group for Child Mortality Estimation (UN IGME) between 1961 and 2020. The dataset aggregates the data from African, European and Asian countries. The figure summarises the global prevalence of mortality in different age groups to provide an overall picture of the urgency of the issue. Infant mortality refers to deaths of children under one year of age and under-five mortality, also known as child mortality, refers to deaths of children under five years of age. Child and infant mortality are communicated as deaths per 1,000 children. The figure shows that the global infant and child mortality rates are almost 24%.
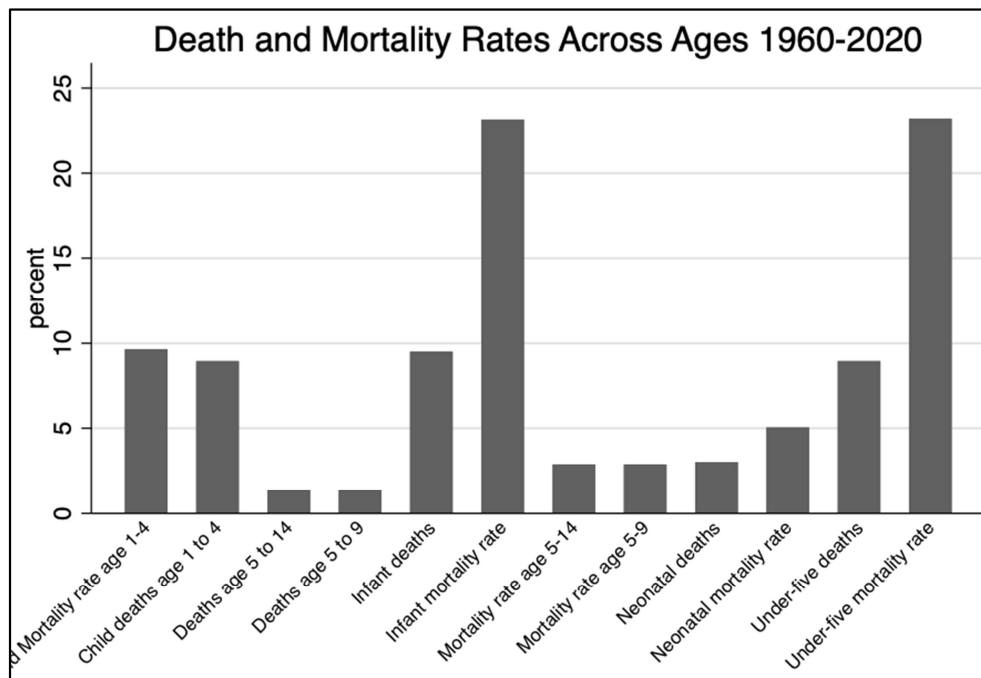

Figure 1. Mortality Across Age Groups.

Given the vulnerability of young children to risk factors, free health coverage for children under six is essential for immunisation against communicable diseases, school, health, and treatment of other illnesses. The introduction of free health insurance has dramatically improved immunisation among children. Measles vaccines coverage increased from 45% in 1982 to 100% in 2005, and the number of children who received the full dose of poliomyelitis increased from 74% in 1982 to 95% in 2005 [32].

Jordan free health insurance policy for children under the age of six is an important step to achieve the comprehensive health coverage goal. Only a few countries such as Vietnam, Philippines, Taiwan, and Karnataka state of India have

employed similar policy targeting children [26]. Therefore, there are few empirical studies evaluating the impact of these policies on achieving UHC goal. This paper contributes to the existing literature by analysing free health insurance policy covering children under the age of six within the context of Jordan and reach to conclusions on effectiveness of the policy and how it can be expanded to result in better outcomes.

3. Data, Identification Strategy, and Identification Framework

In Jordan, the MoH is the main provider of health services and is supported by USAID. Therefore, USAID keeps track of the improvements in the health system, so this paper uses USAID's Jordan DHS to conduct the primary analysis. The data is obtained from DHS IPUMPS, which provides information on demographic and health indicators. The main results are from the JDHS 2017. The dataset includes information on health insurance status, women's and children's health and well-being, development outcomes, health service utilisation, and out-of-pocket expenditures. There are two groups treated differently in this study. Children up to 72 months of age are eligible for free health insurance by the MoH, and children beyond the age of 72 months have to pay for their visits to hospitals or health centres. Using RDD with age as the running variable, the paper examines how free health insurance coverage leads to differences in health care utilisation between these groups. RDD is one of the most useful tools for evaluating policy changes. As explored in the literature review, RDD is widely used to evaluate health policies, especially health insurance policies. This paper exploits the discontinuity based on the age of the children, which is the determinant of free insurance eligibility. The paper uses age in months to ensure an accurate analysis and precision of the treatment effect.

RDD allows causal inference using observational data by assigning individuals to a treatment or control group. The treatment group consists of children older than 72 months, which is the threshold for free insurance eligibility, and the control group includes children younger than this threshold. First, insurance coverage data are used to examine whether the insurance status of children older than 72 months has changed. Then, health service use behaviors are examined, as these are likely to change due to the change in insurance status. The number of visits to health services such as health centres and hospitals, outpatient visits, and use of private clinics are examined to assess the change in behaviour. To understand the impact of the policy on out-of-pocket spending, the cost of the most recent outpatient visit and other health-related expenditures are considered.

To show the causality between the policy and child well-being, the prevalence of wasting among children is analyzed. The results are presented in non-parametric form. The change from the cut-off is estimated by taking the closest point to the cut-off with sufficient observations. This method allows for covariate-adjusted point estimation, heteroscedasticity-robust and cluster–robust estimation methods [16]. This method allows relaxing the assumption that the mean of the outcome is the linear combination of the covariates [34].

To count for the endogeneity of the treatment effect, that is purposefully caused by the changes in insurance status, the estimation framework is Fuzzy Regression Discontinuity. In Fuzzy RD, the continuous variable is not the determinant function of the outcomes; it only changes the probability of receiving the treatment. In Fuzzy RD, the reason for discontinuity that insurance status becomes the instrument for the second stage estimations. The first stage variable is the insurance status, and it is estimated by using the ordinary least Squares (OLS). Using OLS for the second stage estimations would lead to biased estimates. Fuzzy RD is similar to the Instrumental Variables (IV) Approach as the reason of discontinuity becomes the instrument and leads to 2SLS estimates. The parametric IV form can be represented as:

$$D_i = \gamma + \beta_1 T_i + \beta_2 (A_1 - c) . T_i + \beta_{k \sum_k x_{ki}} + \epsilon_i$$

Regression discontinuity assumes internal validity, which means that the causal inference is valid at the cut-off and that there would be no discontinuity in absence of the policy [9]. Therefore, it refers to how confident we can be about the association between an intervention and an outcome [42]. RDD also assumes external validity that is the generalizability of the results and to achieve this, it is necessary to contrast the observations close to the cut-off to the ones far from the cutoff [1]. RDD relies on assumptions such as perfect adherence to the cut off rule, and no factors other than the program of interest are the reason for the discontinuity [41].

4. Results

This section describes the variables chosen to conduct the analysis and provides the summary and descriptive statistics, followed by the first-stage OLS estimates and the second-stage IV estimates. The results are shown in Tables 2, 3 and 4 respectively. The discontinuous jumps at the border are illustrated in RDD pathways to support the analysis. For the OLS and IV estimates, covariates are included to increase the precision of the results. These covariates are household size, male household head, household income status, child's sex, and mother's educational attainment in years. In RD, generally the observations closest to the cut-off present the most accurate results as there may be other factors further away from the cut-off that can affect the outcome. The availability of observations allowed the range to be set within six, twelve and eighteen months of the cut-off to provide valid results.

***Table 2.** Summary and Descriptive Statistics.*

Variable	Whole Sample		Treatment		Control	
	Mean (s.d)	Obs.	Mean (s.d)	Obs.	Mean (s.d)	Obs.
Insurance	0.749 (0.434)	9,445	0.758 (0.489)	6,616	0.729 (0.440)	2,829
Number of Visits	1.444 (0.765)	9,445	1.507 (1.298)	6,616	1.298 (1.507)	2,829
Outpatient Visits	0.050 (0.212)	9,445	0.050 (0.212)	6,616	0.048 (0.207)	2,829
Using Private Hospitals for Outpatient Visits	0.079 (0.270)	9,445	0.080 (0.271)	6,616	0.077 (0.267)	2,829
Wasting Among Children	0.132 (0.339)	9,434	0.142 (0.350)	6,610	0.109 (0.311)	2,824
Cost of Health-Related Expenses	3.513 (30.292)	9,439	3.563 (30.410)	6,590	3.396 (30.123)	2,789

Notes: The table shows the mean and standard deviation of the variables of interest for overall sample, treatment group that includes the children under the age of six and the control group that includes the children older than six years old.

4.1. Outcome Variables

The first stage outcome is the insurance coverage that indicates whether the children are covered with health insurance or not, and this is the variable to which the policy primarily refers. As the summary statistics in Table 2 show, 75% of children ages 0 to 12 have health insurance. The descriptive statistics show that coverage for children under 72 months of age is 76%, while 73% of children older than 72 months are insured. Under normal circumstances, this percentage should be close to 100%, given that insurance is free, and the government wants to ensure that all eligible children are insured. However, there is some friction; enrollment is voluntary and people in rural areas of Jordan do not have access to information about the availability of government services. Free health insurance is provided based on registration, and in rural areas, birth registration which is a prerequisite for accessing government services can be problematic due to cost, lack of information or geographical reasons [7].

Other outcomes of interest include variables concerning the healthcare utilisation such as children's use of outpatient services, number of outpatient visits and use of private health services. Changes in eligibility status for insurance coverage can cause big differences in healthcare utilisation. The variable of interest is continuous and indicates the frequency of children visiting the hospital and it is a mother reported outcome. The summary statistics in Table 2 in the Appendix show that children aged between 0 to 144 months visit the hospital 1.5 times. The descriptive statistics in Table 2 show that children under 72 months visit the hospital 1.5 times, and children older than 72 months visit 1.3 times.

Outpatient visits do not require a prolonged stay at the facility and patients usually leave the hospital the same day. Zhou et al. [22] analyse the effect of health insurance on the utilisation of outpatient services, and their study suggests that the utilisation of outpatient services is significantly lower among uninsured individuals. The summary statistics in Table 2 show that 5% of children had an outpatient visit within the last four weeks. On average, there is no difference between children who are eligible for free health insurance policy and those who are not, as shown by descriptive statistics. The Jordanian MoH provides subsidised health services at a low cost. In Jordan, the cost of outpatient visits

depends on which service is claimed but on average the cost per visit is 37.4 Jordanian Dinars [40, 17]. However, the public health sector suffers from increasing population, health care costs, unorganized growth of the health care system, poor institutional planning, and lack of qualified health care personnel [31]. This may affect the choice of hospital when it comes to the treatment of their children. In general, insurance is associated with higher utilization and lower out-of-pocket spending, yet this also depends on the insurance scheme in which individuals enrol [35]. As shown in Table 2, 8% of the sample use private hospitals for outpatient visits, and the descriptive statistics in Table 3 show that there is not much difference between the treatment and control groups. Long waiting time is one of the major quality problems in state hospitals. The outcomes that concern wasting, and out-of-pocket expenditures include the variables wasting and cost of the most recent outpatient visit [6].

Wasting is known as low weight-for-height and is caused by malnutrition or frequent illness, and if not properly treated it can increase the risk of death [28]. As stated in the guidelines of WHO, a child is considered as wasted if the weight to height ratio is less than -2 standard deviations below the mean of WHO's Child Growth Standards. Although wasting is a common problem for children under five, it also causes one-third of mortality among school children [12]. The SDGs call for the elimination of all types of malnutrition, which is the cause of wasting and the reduction of the number of children suffering from wasting to less than 3% by 2030. UHC can facilitate the progress towards the elimination of wasting as it can improve the access of children to treatment [5]. The summary statistics in Table 3 show that the prevalence of wasting among children aged between 0-12 years is 13% and the descriptive statistics in Table 3 suggest that it is more common among children aged between 0-72 months. DHS data provide information on out-of-pocket expenditures, and these expenditures include cash payments for health care services such as medications, consultation fees, and laboratory diagnostic tests [25]. In this paper, healthcare costs associated with the most recent outpatient visit, which is a continuous variable is considered. As Table 2 shows, the out-of-pocket expenditures of families with children aged 0 to 144 months is 3.5 on average, and the health care costs of the treatment are slightly lower than those of the control group as shown by the descriptive statistics in Table 2.

4.2. First Stage Estimates

The first stage estimates in Table 3 show the insurance status of children and how their health care utilisation changes accordingly.

Table 3. *First-Stage Estimation Results.*

Insurance	66≥months≥78	60≥months≥84	54≥months≥90
treatment	0.749 (0.434)	0.758 (0.489)	0.729 (0.440)
household_size	1.444 (0.765)	1.507 (1.298)	1.298 (1.507)
male	0.050 (0.212)	0.050 (0.212)	0.048 (0.207)
poor	0.079 (0.270)	0.080 (0.271)	0.077 (0.267)
boy	0.132 (0.339)	0.142 (0.350)	0.109 (0.311)
years_education	3.513 (30.292)	3.563 (30.410)	3.396 (30.123)
Obs,	766	1,434	2,157

Notes: The table shows the first stage estimates that is of insurance coverage of children aged 66 to 78 months, 60 to 84 months, and 54 to 90 months. The chosen bandwidths are within 6, 12 and 18 months of the cut-off. Covariates include household size indicating the number of persons in the household, male indicating that the head of household is male, poor designates that the household belongs to the low-income segment, boy states that the child is a boy, and years in education} is the mother's education level in year. Standard errors are in parentheses. *** p<0.01, ** p<0.05, * p<0.01.

Figure 2 below shows the negative discontinuous jump at the cutoff that children older than 72 months are less likely to be insured.
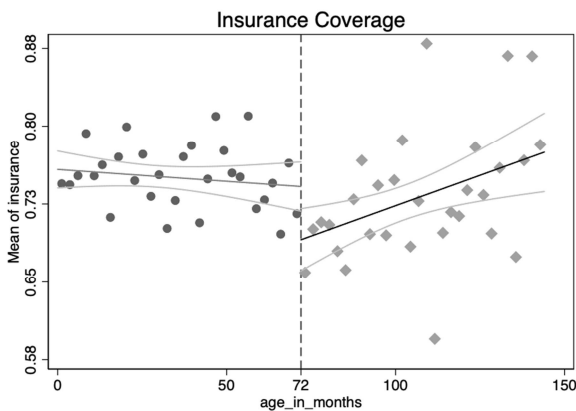

Figure 2. *Insurance Status of Children.*

Despite the negative jump, the regression coefficient of 17 percentage points (pp) is positive. This is because treatment status is assigned to children younger than 72 months and the regression coefficient indicates their insurance status. Therefore, the probability of being insured is 17 percentage points higher in the treatment group and statistically significant within the bandwidth of six months. The observations that are twelve and eighteen months further from the cut-off have lower coefficients indicating a decrease in the likelihood of being insured. The household head being male, and the mother's years of education are two factors that have a positive and significant effect on the treatment status. Having free insurance may affect several outcomes, such as the number of hospital visits, the choice of health care services (public/private), outpatient visits, child wasting, and out-of-pocket spending, which are examined in the next sections. The results are in line with Palmer et al. [26]'s results. The free health insurance policy in Vietnam also increased the likehood of being insured for children under 72 months by 0.202 pp.

4.3. Second Stage Estimates

Panel A in Table 4 shows the outcomes concerning the health utilisation behaviour of children relying on the mother-reported outcomes. Panel B in Table 4 shows the wellbeing and out-of-pocket expenditure outcomes that are concerned with the children suffering from wasting and the cost of the most recent outpatient visit.

The results are also explained by using RDD pathways for the outcomes with significant differences are illustrated in figures 2, 3, 4 and 5. These pathways show that the policy has a significant effect on the outcomes on the children on either side of the cut-off. The horizontal axis of the RDD graphs show the age of the children that is the running variable, and the vertical axis is the mean of the outcome variable.

"To what extent do the changes in the number of hospital visits depend on insurance eligibility?" The variable of interest is continuous and indicates the frequency of children visiting the hospital and it is a mother-reported outcome. Figure 3 shows the negative discontinuous jump indicating that the control group makes less frequent visits to hospitals on average. The second stage estimates in Table 4 show that insurance is positively associated with the number of visits and showing an increase in the number of visits.

Table 4. *Second Stage Outcomes.*

Panel A: Health Utilisation Outcomes									
Variables	**number of visits**			**recent outpatient visit**			**use of private health services**		
	66 & 78	**60 & 84**	**54 & 90**	**66 & 78**	**60 & 84**	**54 & 90**	**66 & 78**	**60 & 84**	**54 & 90**
insurance	1.479**	2.069**	2.479**	0.254	0.242	0.254	0.612**	0.190	0.308
	(0.534)	(0.835)	(0.803)	(0.152)	(0.194)	(0.202)	(0.183)	(0.265)	(0.234)
household size	0.000	0.0037	0.002	-0.001	-0.000	0.000	-0.001	0.000	-0.001
	(0.007)	(0.007)	(0.005)	(0.002)	(0.001)	(0.001)	(0.002)	(0.002)	(0.001)
Male	-0.159	-0.331*	-0.284*	-0.004	-0.050	-0.033	-0.048	-0.068	-0.055
	(0.149)	(0.161)	(0.147)	(0.033)	(0.039)	(0.033)	(0.074)	(0.068)	(0.048)
poor	-0.071	-0.134*	-0.048	0.016	0.010	0.009	0.004	-0.007	-0.005
	(0.057)	(0.058)	(0.057)	(0.022)	(0.013)	(0.010)	(0.028)	(0.014)	(0.012)
boy	0.057	0.034	0.021	0.033	0.015	0.012	0.036	0.016	0.018
	(0.061)	(0.051)	(0.055)	(0.017)	(0.013)	(0.010)	(0.026)	(0.018)	(0.014)
Years_in_education	-0.032**	-0034***	-0.027***	-0.004	-0.003	-0.001	-0.008**	-0.005*	-0.002
	(0.014)	(0.012)	(0.010)	(0.003)	(0.003)	(0.002)	(0.003)	(0.003)	(0.002)
Observations	766	1,434	2,517	766	1,434	2,517	766	1,434	2,517

Panel B: Well-Being and Out of Pocket Expenditures					
Variables	Wasting			cost health		
	66 & 78	**60 & 84**	**54 & 90**	**66 & 78**	**60 & 84**	**54 & 90**
insurance	-0.404*	-0.158	.041	57.238	42.150	50.837
	(0.182)	(0.266)	(0.276)	(37.914)	(47.546)	(46.915)
household size	-0.002	-0.004*	-0.004**	0.052	0.018	-0.034
	(0.001)	(.001)	(0.001)	(0.355)	(0.218)	(0.174)
male	0.076	0.069	0.038	-4.355	-6.334	-6.678
	(.053)	(.045)	(0.035)	(5.282)	(7.611)	(6.022)
poor	.005	0.003	0.000	-1.526	0.039	-0.439
	(.024)	(.015)	(0.014)	(5.282)	(3.990)	(2.600)
boy	-0.030**	-0.011	-0.023	5.504	0.735	0.894
	(0.009)	(0.009)	(0.012)	(3.794)	(2.345)	(1.794)
years in education	0.009**	0.009**	.004	-0.596	-0.545	-0.392
	(0.003)	(0.003)	(0.003)	(.660)	(.641)	(.442)
Observations	766	1,434	2,157	756	1,420	2,141

Notes: The table shows the parametric estimations within six, twelve, and eighteen months of the cut-off. Panel A shows the IV results of the health utilisation outcomes as the independent variable within the bandwidths indicated above. Panel B shows the second stage IV estimates of the outcomes concerning children's welfare and out-of-pocket expenditures.* $p<0.05$, ** $p<0.01$, *** $p<0.001$. Standard errors are clustered according to the running variable.
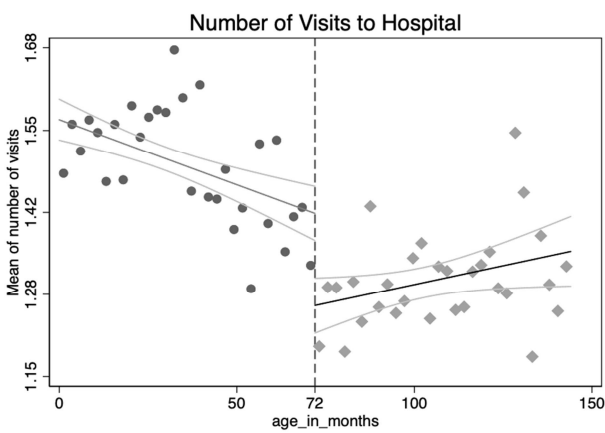

***Figure 3.** Number of Visits to Hospital.*

Outpatient visits do not require a prolonged stay at the facility and patients usually leave the hospital the same day. Zhou et al. [22] analyse the effect of health insurance on the utilisation of outpatient services, and their study suggests that the utilisation of outpatient services is significantly lower among uninsured individuals. Thuong [4] indicates that a revised health insurance policy in Vietnam that expanded the coverage also caused a significant increase in outpatient visits. However, the literature on the correlation between outpatient visits and health insurance is scarce. The regression results in Table 4 also show that the impact of insurance on outpatient visits is positive, indicating more visits by the insured children. However, the effect is not statistically significant. Figure 4 and the IV estimates in Table 4 show that the predicted level of utilisation of private health services is significantly higher than that of the public health services, especially at the closest point to the cut-off. Children who are not eligible for free health insurance are more 61 pp more likely to use public services when they do not need urgent treatment. This may be caused by the low quality of public health services, lack of access to health services, or the fact that parents of children over the age of six are unable to allocate additional funds from their household budgets for heath expenditures, so they are more likely to use government health services. The results are similar to Mata et al. [30]'s findings that compare the insurance status and related outcome of children just above and just below income that determines the free health insurance eligibility criteria. According to their results children who can benefit from free health insurance are 13 to 202 pp more likely to use preventive health care services depending on the age group.
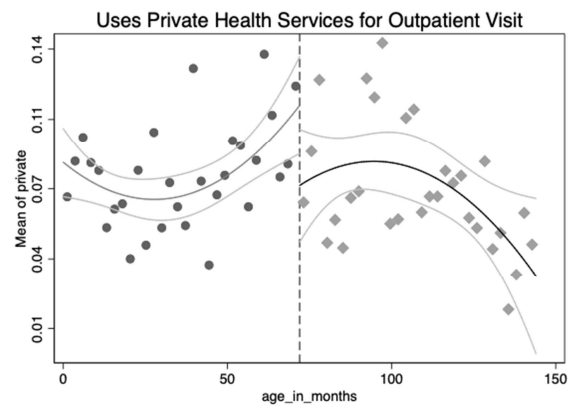

***Figure 4.** Use of Private Health Services for Outpatient Visits.*
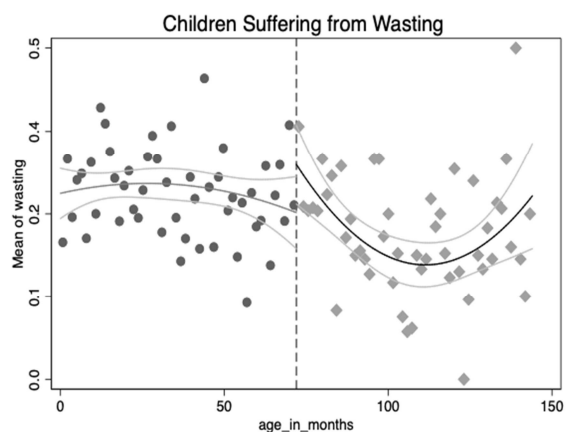

***Figure 5.** Prevalence of Wasting Among Children.*

Although the descriptive statistics in Table 2 suggest that wasting is more common among children aged between 0-72 months, looking at the closest points to the cut-off in Table 4, wasting is 40 pp lower among children in the treatment group. This is also confirmed by Figure 5, which shows a positive discontinuous jump for the control group, which includes children older than 72 months. This suggests that wasting increases among children who start going to the school. This coefficient is insignificant and gets smaller as moving away from the cut-off. WHO indicates that the main reason of wasting is insufficient nutritional intake and it happens at early ages. The underlying reason of the significant negative coefficient at the closest point to the cut-off can be that the children start school at age six, when they lose eligibility for free insurance. When children start school, parents cannot check their nutritional intake regularly. The lack of regular health checks and advice in this transition period may cause an increase in wasting. As moving away from cut-off, parents can notice the problem and take an action and this problem is less prevalent among older children.

In terms of the health care costs, the descriptive statistics in Table 2 indicate that the children in the treatment group have slightly lower expenses than those of the control group. The large but insignificant coefficient in Table 3 confirms the higher out-of-pocket expenditures of the treatment group. The reason for the higher costs is the preference for using private health care services and more prescribed drugs due to more frequent hospital visits. Yet the results do not put forth a significant difference between the treatment and control groups.

5. Discussion and Conclusion

According to the policy, school-age children and teens in puberty are not eligible for free health insurance. For many children, these are crucial times as they start engaging in activities that will have a long-lasting impact on their adult lives. Currently, Jordan may not have sufficient resources to provide health insurance coverage to school-age children. However, the Student Health Survey identifies risk factors in this group. Alarming risks include obesity, mental disorders, and poor dental hygiene. Extending health insurance coverage to school children would pave the way for improving the health of these young individuals. Therefore, as stated by UNICEF [20] a particular programme for school-age children that allows them to access a specific set of preventive health services free of charge can bring long-term benefits. As indicated by Kaldewei [33] the health reform has been successful and improved in the equity of access, setting a goal of full formal insurance coverage for all; and improvements of efficiency and clinical effectiveness of service delivery, and standards of service delivery. Despite the success, challenges such as inefficiencies in provision and financing of health services remain. Currently, Jordan has an advanced and affordable health care system, yet; it is a low-income country. The quality of care in many public hospitals and clinics is low, and accessibility can also be problematic. This paper analyses how free health insurance coverage for children under six changes the healthcare utilisation behaviour and whether it affects household welfare. The results suggest that children who are eligible for free health insurance are more likely to regularly visit hospitals or other health care services, use outpatient care and private health services. Health care-related expenditures are higher for this group, which is a consequence of using private health services. The prevalence of wasting is lower among insured children. This proves that this policy plays a significant role in improving the well-being of children, as wasting can lead to mortality and adverse physical and mental development outcomes. In Table 3, although not significant, the results show an increase in spending on health-related costs for those children who are eligible for free health insurance, which is associated with increased use of private services. However, Sepehri et al. [38] suggest that free health insurance could reduce the burden on household budgets, as the results indicate that such insurance in Vietnam reduced out-of-pocket expenditures by 16 to 18% among low-income households. This issue may be context dependent and might be investigated when more detailed data is released on Jordan. This paper examines the free health insurance policy for children in Jordan by analysing its causal impact on health service utilisation in terms of frequency and type of health service utilisation, out-of-pocket expenditures, and children's well-being. The paper contributes to the existing literature by analysing the effectiveness of current health insurance policy and suggesting ways to make it more effective. The policy of free health insurance plays a crucial role in improving access to health services and is an important tool that paves the way to achieve the goal of UHC. The policy also leads to improved health outcomes for children as wasting is lower among the insured. The most vulnerable group is undoubtedly children younger than six years. Nevertheless, the literature suggests that school children are also at risk and, this is well-supported by the analysis presented in this paper. Wasting is common among school children who cannot benefit from free insurance. Increasing spending on health care is a challenge for any country. A government needs to manage health care spending efficiently to establish a sustainable and equitable system. The impact of this policy can expand if the government can ensure that all eligible children can benefit from this program, along with increasing the insurance eligibility age to cover children entering primary school.

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