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ABSTRACT

The Effect of Universal Health Care on the Out-Of-Pocket Health Expenditures: Evidence from a Natural Experiment

In the first two quarters of 2013 the Georgian government introduced and fully implemented a universal health care (UHC) plan covering all those not-yet publicly or privately insured. We estimate the effect of the introduction of the universal healthcare plan on the level of out-of-pocket (OOP) health expenditures of households. We find that the program saved households an economically and statistically significant amount of 92 GEL per household/month: a major effect, amounting to about 10% of the average household monthly income and 30% of the average individual monthly income at the time. The OOP payments reduction is almost totally attributed to people utilizing serious, emergency, or life-saving inpatient and outpatient services—lending support to the hypothesis that the UHC program, not only has reduced the OOP health expenditures, but it might have also improved the overall health status in the country.

JEL Classification: I13, I18, H51

Keywords: universal healthcare, out of pocket health expenditures, public health, health insurance

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1. Introduction

Health care accessibility and affordability are important determinants of life quality. Under the Soviet Union, Georgia offered universal health coverage, which was financed through taxes. The so called Semashko model of health care, which operated in the Soviet Union, was generally viewed as a success until the 1970s. Nevertheless, high level of specialization and decreasing role of district physicians which acted as gatekeepers rendered the system hard to navigate for patients. While in principle most services were supposed to be free, people often paid out-of-pocket (OOP) to ensure quality of care (Bulletin of the World Health Organization, 2013).[1] In 1991, following the collapse of the Soviet Union it became impossible to sustain public health care spending and real per capita public expenditures on health care decreased drastically from $13 in 1990 to less than $1 in 1994. As the system became more market based the importance of OOP payments increased, resulting in a diminished access to health care services (Rukhadze, 2013).

Georgia is a country with one of the highest OOP expenditures for medical services in Europe and other countries with a comparable economic profile, with around 90% of the health care expenditures being financed with OOP money (Shengelia et al., 2016). This can have serious implications for both accessibility and affordability of health care services and can translate into lower quality of health, higher rate of self-treatment or no treatment and even increased mortality rates. This is especially problematic for the low-income population that cannot afford private insurance and are often disincentivized from seeking medical services. In 2006 the government of Georgia started implementing a Medical Insurance Program (MIP) with an intention of decreasing OOP spending for the most vulnerable population. The program provided households with

[1] OOP payments are defined as "copayments, fee-for-service payments, self-medication, informal payments and all other expenses paid directly (in cash or in-kind) by the households for the health services and goods, including drugs and other medical non-durables." (Belli et al., 2004).

vouchers that could be used at an insurer of their choice. In 2009, the government also offered voluntary public health insurance program that cost 5 Georgian Lari (GEL) and offered a basic insurance package.[2] In 2012 MIP was expanded to include pensioners, people with disabilities, students and children under the age of 6 who were not included in the first phases of the program. They enjoyed the same benefits as the initial beneficiaries, however, with small copays. In 2012, around 38% of the population had public insurance from the state, 8% had private and corporate insurance and 54% of the population were uninsured (Shengelia et al., 2016). Despite the fact that some people received state insurance, only a small share of services was included in the package, leaving OOP expenditures above 75% in 2012 (World Bank, 2019).

In 2013, the Georgian government introduced a set of reforms in the health care system. The Universal Health Care (UHC) Program was launched and covered more than two million citizens who were still uninsured at that point. The two programs (MIP and UHC) offered similar benefits but remained as separate programs until April-September in 2014 when all public insurance programs turned into one Universal Health Coverage program (WHO, USAID, WB, 2015). The rationale behind the UHC was to increase financial and geographical accessibility to medical services, especially to the primary health care services, which act as a gatekeeper and can be used to regulate health care costs, by preventing unnecessary referral to high-cost services (Shengelia et al., 2016). Nevertheless, the cost of the program was significant. Healthcare spending doubled from 2012 to 2013 from 365 million to 634 million GEL, making assessment of the program and its effectiveness crucial (Verulava et al., 2016).

[2] 1 USD = 2.71 GEL as of Aug 09, 2022.

While there are several studies evaluating the effects of the Universal Health Care program on health care service utilization in Georgia, the studies that look at the changes in OOP expenditures are scarce and fail to provide detailed analysis of the topic. With a high burden of OOP expenditures on the Georgian population, especially on the poor, determining whether this program alleviated the situation for the most vulnerable population is important.

This paper evaluates the effect of UHC program on the OOP expenditures of the previously uninsured population. We find that UHC indeed reduced OOP health expenditures by a great margin (around a monthly 92 GEL per household, which is about 9.5% of the average household income and 30.5% of per capita income). Moreover, almost all (96%) of this reduction was experienced by people who needed inpatient and outpatient important and emergency medical services, rather than less life threatening conditions like dental services, therapeutic appliances, pregnancy and delivery, preventive care medicine, and chronic diseases. In that, the program can be deemed life-saving.

The next section provides a contextual background of the country and its healthcare system; it also surveys the relevant studies about this issue. Section 3 describes the data used in this study. The econometric methodology used to study the effect of public healthcare plans on OOP health expenditures is found in Section 4. Section 5 provides the main results and findings of this study. Section 6 provides concluding remarks.

2. Background

Georgia is a developing country with a population of 3.7 million people. Approximately 58% of the population is urban, with a large majority living in the capital city of Tbilisi. Population growth in Georgia is 1.5% and the share of the elderly is growing, increasing the financial burden of healthcare and pensions. The average income has been growing annually for the past fifteen years,

however, poverty rate, inequality, and unemployment continue to be some of the major challenges in Georgian society. The average monthly income per household has been growing consistently over the past years, reaching 1,110.7 GEL, while average monthly income per person is as low as 317.2 GEL, with subsistence minimum for working age male is 175 GEL according to 2018 data about employment and wages.[3]

2.1 The Healthcare system in Georgia

Healthcare system of Georgia has undergone various challenges since the collapse of the Soviet Union. From 1990-1994 public per capita healthcare spending decreased from $13 to just $1 and since then the government has been actively involved in reforming the healthcare system in Georgia. The first wave of the reform took place in 1991-2004 and introduced the Basic Benefit Package (BBP), which covered some of the basic services free of charge, however combined with inadequate health care management, corruption and serious underfunding, it failed to provide adequate level of care and protection to the population (Shengelia et al. 2016).

In 2004 the second stage of the reform started, aiming at improving quality, accessibility, and affordability of health services. Unlike the first stage, government was actively supporting privatization of hospitals and development of private sector. By 2010, almost 100% of the hospitals were sold to private owners, mostly pharmaceutical companies. Monopolization resulted in rising health care costs and combined with high poverty rate and out-of-pocket expenditures public's ability to access healthcare was extremely limited (Shengelia et al. 2016). In 2007, 70.9% of total health expenditure were financed by out-of-pocket money, and public provision on healthcare was only 1.5% of GDP (Rukhadze, 2013). In 2006, the government introduced Medical Insurance for

[3] Statistical office of Georgia, GeoStat: https://www.geostat.ge/en/modules/categories/50/households-income (last accessed 11-8-2022).

the Poor (MIP), which targeted the most vulnerable population—people below the national poverty line. In 2009 the program was extended to include IDPs, orphans and teachers, and in 2012 children under the age of 5 and elderly above 65 were also included. In 2009 voluntary public health insurance program was offered for general population which cost 5 Gel and offered basic benefit package with 2/3 copay funded by the government. These programs increased total health expenditure significantly, reaching 9.9% of GDP in 2011. Private health expenditure accounted for 77.9% of the total expenditures, with 89.2% of that amount being out-of-pocket spending (Rukhadze, 2013). These numbers indicate continued struggle of the Georgian population to pay for health care services.

To address these problems, in February of 2013 the Universal Health Care (UHC) program was introduced, which covered more than 2 million previously uninsured people (90% of the population, the remaining 10% were privately insured). From February 28 to June 30 of 2013 UHC covered only basic services: urgent hospital assistance, urgent outpatient assistance and scheduled outpatient services. In July 1, UHC expanded its services and started offering additional services, including primary health care services, urgent outpatient assistance, extended urgent hospitalization, planned surgeries, oncological diseases and child delivery (Shengelia et al., 2016). We utilize the peculiar time of introducing and implementing this program (quarters 1 and 2 of 2013) to study its effects on OOP health expenditures, using a panel of households who have been observed both right before and right after the implementation of this program (quarters Q4/2012 and Q3/2013).

2.2 Previous Studies

Various studies indicate that high OOP expenditures can discourage low-income people from seeking medical care, and in case of serious illness can lead to significant financial burden and

impoverishment of the family or alternatively, inadequate quality of care and medical attention. By 2006, health care utilization rate in Georgia was one of the lowest in Eastern Europe and Central Asia (WHO, 2009). Among those who received medical care, the financial burden was significant. Gotsadze et al. (2005) showed that 30% of the poorest households in Georgia that received outpatient services were unable to pay medical bills and 70% of them borrowed money from friends or relatives, 10% sold valuables and 10% sold household goods to finance the expenditure. Evidence from Cambodia indicated that medical services often led to indebtedness and majority of the poor households were unable to repay within a year's time, putting these families under financial stress (van Damme et al., 2004). Similar problems exist in Latin American countries, where the share of out-of-pocket expenditures is high among the first two deciles of income distribution, which translates into the lack of financial security for the poorest (Galárraga et al., 2010).

Once out-of-pocket spending exceeds a certain threshold (which can vary, but is commonly considered to be 40% of household's income), healthcare expenditures are classified as catastrophic spending. Wagstaff et al. (2017) conducted a retrospective observational study on catastrophic health spending in 133 countries between 2000-2015 with an intention of finding associations between catastrophic health spending and health related variables like availability of universal health coverage and the share of GDP spent on health. They found that availability of health insurance or national health services "is a poor indicator of financial protection. Increasing the share of GDP spent on health is not sufficient to reduce catastrophic payment incidence; rather, what is required is increasing the share of total health expenditure that is prepaid, particularly through taxes and mandatory contributions." Despite the fact that the authors do not discuss the results on individual country basis, they present a map showing the incidence of catastrophic health

spending and Georgia ranked among the countries with highest out-of-pocket spending among the 133 countries, stressing the importance of this problem.

Richard et al. (2018) studied the relationship between OOP expenditures and medical debt in the United States. The study indicated that the burden was especially heavy on people with chronic conditions. Households with 1-3 chronic conditions had 1.74 higher odds of having OOP payments compared to households without chronic conditions and also had higher odds of having medical debt. They also showed that the medical debt was more prevalent in female-led households, and the age group that suffered the most from OOP expenditures were people between 18-34. Interestingly, they found that people without insurance were less likely to have OOP costs than people with health insurance (potentially indicating avoidance of medical visits), but among those uninsured who had OOP costs, they had higher expenditure compared to the insured population.

Gotsadze et al. (2015) studied the effect of the medical insurance for the poor (MIP) program on access and affordability of healthcare services. They found that MIP played a major role in reducing the costs of health care services. The reduction was larger for the poor segment, and decreased spending by 26.8 Gel for outpatient visits and 68.7 Gel for monthly healthcare costs. Despite positive effects of MIP, overall utilization of services did not increase. According to Shengelia et al. (2016), exclusion of pharmaceutical costs from the package constituted a major hindrance in visiting doctors.

Since February 28, 2013, Georgia joined the list of countries that offer universal health coverage. The goal was to increase accessibility and affordability of healthcare services by turning 2,300,000 previously uninsured people into the beneficiaries of the program. Verulava et al. (2016) assessed utilization of healthcare services and patient satisfaction with the program. The results indicate

that UHC program significantly increased healthcare visits for all the categories, including visits to family doctor, specialized doctor, lab analysis, and for instrumental examination. Also, qualitative research and phone survey carried out in 2014 showed that only 2% of the population were dissatisfied with UHC program. Experts believed that the program increased accessibility of services, introduced free choice of providers and included a wide variety of services and examinations. On the other hand, limited coverage of medicine was assessed negatively, as well as long waiting time for planned surgeries. Physicians were also worried about monopolization of insurance market under public insurance and its effects on development of insurance market and prices of medical services.

3. Data

We use data from the Integrated household survey (IHS), conducted by the statistical office of Georgia (GeoStat). The survey has been implemented annually since 1996, although publicly available data are found only from the year 2009 onwards.[4] The IHS is a rotating quarterly panel data, with a quarter of the sample renewed quarterly and staying in the sample for four consecutive quarters.[5] Data that are more than one year apart include completely different and totally independent households.

Although the fact that households can be observed as a panel for at most four quarters is limiting, we still can utilize the structure of these data to capture the effect of the introduction of the UHC program: since implementation of the UHC program started in the first quarter of 2013 (to be exact, on Feb/28/2013), and has been completely implemented by the second quarter of 2013 (around the

[4] Data were collected for the whole of Georgia excluding conflict areas Apkhazeti and Tskhinvali; since 2017 the data were consolidated from different sources and renamed "Household incomes and expenditures survey," see: https://www.geostat.ge/en/modules/categories/128/databases-of-2009-2016-integrated-household-survey-and-2017-households-income-and-expenditure-survey.

[5] http://www.lisdatacenter.org/wp-content/uploads/our-lis-documentation-by-ge10-survey.pdf

end of June 2013), there is a set of households who have been observed in Q4/2012, right before the implementation of the program, who also have been observed in their last interview in Q3/2013, right after the complete implementation of the program. With this subset of the data (Q4/2012 with Q3/2013, of the very same households) we can study the effect of the introduction of the universal health care (public insurance) program on the out-of-pocket (OOP) health expenditures of these people—by comparing people who have been with some sort of public health insurance program and continued to be covered by the new UHC program (the control group) with people who have not been covered by any type of health insurance and turned to be covered by the UHC after full implementation (the treatment group).

The IHS includes micro data about the demographic characteristics of all members of the household, as well as the total income and total expenditures, and a detailed decomposition of the expenditures, in particular that related to health expenditures as well as the health-insurance status of the respondents. Also, from the annexes of the data we can learn about the decomposition of health expenditures among its subcomponents like inpatient and outpatient spending, chronic-disease related expenses, spending on preventive care, birth and pregnancy, dentists, and therapeutic appliances. Income and expenditures related data are reported in monthly averages of the last three months. The monetary data were adjusted to inflation, using the general consumer price index, and expressed in the equivalents of Georgian Lari (GEL) of Q4/2012. Analysis samples are limited to one main representative of the household (the head of the household or her/his spouse), aged 16 years or above.

Table 1 includes summary statistics of the main variables used in this study. These refer to the "matched samples," the subsample of the data that includes households that appear in both periods of the analyzed data: in the fourth quarter of 2012 and in the third quarter of 2013. Similar summary

statistics for the "mismatched sample," including all households from Q4/2012 and all households from Q3/2013, are found in Table A1 of the appendix.

Table 1: Summary Statistics, Matched samples

	No insurance		Public		Private	
	Mean	SD	Mean	SD	Mean	SD
			Quarter 4 / 2012			
Health expenditures (household)	69.69	365.49	73.99	149.05	86.93	146.04
Health expenditures (adult equivalent)	23.44	148.87	24.58	43.44	29.10	55.83
Age	42.52	11.28	57.23	16.40	44.56	11.53
Chronic disease	0.17	0.38	0.34	0.48	0.10	0.30
Married	0.80	0.40	0.82	0.39	0.93	0.26
Urban	0.38	0.49	0.25	0.44	0.59	0.50
Size of household	4.03	1.76	3.97	1.88	4.02	1.49
Azerbaijani	0.04	0.20	0.01	0.09	0.00	0.00
Armenian	0.07	0.26	0.07	0.26	0.00	0.00
Total monthly expenditures	952.56	863.32	729.58	607.93	1566.73	1268.27
Monthly income inflows	907.33	890.12	712.40	598.61	1570.83	1262.72
Observations	252		236		41	
			Quarter 3 / 2013			
Health expenditures (household)			80.30	409.58	82.98	181.32
Health expenditures (adult equivalent)			25.12	90.43	32.32	76.36
Age			50.36	15.73	44.94	11.65
Chronic disease			0.27	0.44	0.11	0.32
Married			0.81	0.39	0.91	0.28
Urban			0.32	0.47	0.60	0.50
Size of household			4.09	1.84	3.94	1.55
Azerbaijani			0.02	0.15	0.00	0.00
Armenian			0.07	0.25	0.03	0.17
Total monthly expenditures			819.74	780.40	1843.62	1722.61
Monthly income inflows			830.45	781.64	1919.26	1759.47
Observations			494		35	
Total Observations		252	730		76	

Notes: expenditures and income are all expressed in Georgian Laris (GEL) of Q4/2012, and refer to the monthly average within the quarter. Overall sample size: 1,058.

The summary statistics of the outcome variables (total household health expenditures, and adult-equivalent health expenditures) and the main control variables (like age, martial status, having a chronic disease, nationality, household income and total expenditures) are calculated for matched households only, by period (Q4/2012 versus Q3/2013) and by health insurance status: no insurance, public insurance, and private insurance. The health expenditures do *not* include spending on health insurance—they are out-of-pocket (OOP) expenditures on actual health services when these are received.

Focusing on paired households only, we can observe the average OOP health expenditures in each period, and changes in OOP, in a "transition matrix" that shows those who were and stayed with the same type of insurance (mostly public insurance), as well as movers (switchers) from no-insurance to public/private insurance, or the tiny fraction of households switching their insurance type from private to public and vice versa. These comparisons are found in Table 2.

Table 2: Monthly household health expenditures by status switchers

		Insurance Status in Q3/2013	
		Public	Private
Insurance Status in Q4/2012	No Insurance		
	Expenditures in Q4/2012	70.25 (366.90)	0.00 (0.0)
	Expenditures in Q3/2013	40.07 (88.31)	2.53 (3.58)
	Observations (households)	250	2
	Public		
	Expenditures in Q4/2012	74.17 (149.34)	31.67 (0)
	Expenditures in Q3/2013	125.83 (584.06)	0.00 (0)
	Observations (households)	235	1
	Private		
	Expenditures in Q4/2012	45.19 (85.17)	98.67 (158.11)
	Expenditures in Q3/2013	8.74 (6.43)	90.61 (188.04)
	Observations (households)	9	32

Notes: Household data, for households that appear both in Q4/2012 (their first interview) and in Q3/2013 (their fourth, and last, interview). Expenditures expressed in adjusted Georgian Lari (GEL) of Q4/2012. Total household switchers 529. Standard deviations in parentheses.

As seen in the table, the unconditional decrease in OOP expenditures for the switchers (those moving from no-insurance to public UHC insurance) is 30.18 GEL ($40.07 - 70.25 = -30.18$); while there was a secular trend of an increasing OOP expenditures, captured by those who did not change their status—who have been and stayed publicly insured, an *increase* of 51.66 GEL ($125.83 - 74.17$). Hence, the unconditional *relative* change in OOP payments for the switchers is $-30.18 - (+51.66) = -81.84$ GEL. This is the estimate reported in column (2) of Table 3. Similar, unconditional, comparisons can be made for the other groups. The econometric analysis in the following sections will allow the adjustment of the above gross calculation to differences in demographic and other characteristics of the analyzed households and

individuals, yielding a more accurate (conditional) estimates of the average treatment effect of the UHC program.

4. Econometric Methods

The average self-expenditures on health, or out-of-pocket (OOP) health expenditures, can be expressed by the following equation:

$$(1) \qquad E(OOP_{it}|public_{it}, X_{it}) = \alpha + \beta public_{it} + X_{it}\gamma + \delta t + \mu_i,$$

where $public_{it}$ is an indicator of household i (or its representative member) being insured with a public health insurance or enrolled in a universal health care program, versus not being insured altogether.[6] The vector X_{it} includes a set of household characteristics and characteristics of the head of the household (or his/her spouse), such as: the size of the family, urban/rural living quarters, total expenditures (excluding on health), total income, age, gender, education, marital status, and ethnicity (with Azerbaijani or Armenian ethnic origins, as opposed to Georgian). There are also household and representatives of household characteristics, expressed by μ_i, which also affect the expenditures on health but are otherwise unobservable, although time-invariant. The coefficient δ captures general time-trends in expenditures.

Due to the unobserved individual (and household) characteristics, a cross-sectional estimation of this equation would yield biased estimates of the average treatment effects of being enrolled in a public health insurance program, which are represented by β. Utilizing the rotating-panel nature of the data, around the time when the government started rolling a massive Universal Health Care (UHC) program, allows for a consistent and efficient estimation of the average treatment effects of UHC on the out-of-pocket health expenditures. In particular, letting $t = 0$ denote the time period

[6] The option of having a private health insurance will also be considered, as it pertains to a tiny portion of the actual data/population in different, mostly earlier, time periods.

before the massive enrollment in the UHC and $t = 1$ the time period right after it—in particular, $t = 0$ refers to the fourth quarter of 2012, and $t = 1$ refers to the third quarter of 2013—we can write the individual time-period equations, and their difference as follows:

$$OOP_{it} = \alpha + \beta public_{it} + X_{it}\gamma + \delta t + \mu_i + \varepsilon_{it}, \quad i = 1,2,3,\dots,n, \quad t = 0,1$$

$$(2) \qquad \Delta OOP_i = \delta + \beta \Delta Public_i + \Delta X_i \gamma + e_i$$

where e_i denotes the zero-expected value error term. Noting that $\Delta Public_i$ will now denote the switchers (those who moved from no-insurance before the UHC program to public insurance) versus the stayers (or non-switchers), who are those who were insured in some public insurance program and stayed publicly insured. The analysis will refer to two cases: the benchmark main case, where those who are privately insured (own-funds insurance or insured by the employer) are excluded, so that only people who are uninsured or publicly insured are analyzed. As a robustness check, we will also analyze the sample which includes the privately insured individuals (before or after the UHC).

Focusing only on the two quarters in which the very same households are observed—so that their change in health expenditures and change of status can be observed—the quarter right before the introduction of the UHC program and the quarter right after it, it is possible to estimate equation (2) using a two-way fixed-effects estimation of the following equation:

$$(3) \qquad OOP_{it} = \delta + \beta Public_{it} + X_{it}\gamma + after_{it} + (X_{it} \times after_{it})\phi + w_{it},$$

where $w_{it} = \mu_i + \varepsilon_{it}$. The variable $after$ is a dummy variable that takes on the value 1 if the observation is observed in time $t = 1$ (Q3/2013), and zero if observed in $t = 0$ (Q4/2012). Beside capturing the time trend in OOP from equation (2), equation (3) is more flexible and allows for a different time trends in the effect of the control variables.

5. Results

Estimation results of equation (3) are found in Table 3 below. The parameter of interest, β, is the coefficient of the variable $Public$; when taking into account the time trends in health (and other) expenditures, the two-way fixed effects estimation results in columns 2-4 provide causal interpretation of the estimated effect of being covered by a public health insurance (universal health care, UHC) on the out-of-pocket health expenditures of the household (column 2-3) or the individual (column 4).

Table 3: The effect of public health insurance program on OOP health expenditures

	(1)	(2)	(3)	(4)
	FE	TWFE	TWFE	TWFE
Health expenditures	Household	Household	Household	Adult equivalent
Public insurance	-30.177	-81.841*	-91.797***	-24.142***
	(23.517)	(45.636)	(36.33)	(10.404)
After		51.664	87.853	25.639
		(39.108)	(69.156)	(22.422)
Age			-58.404	-11.032
			(41.274)	(8.927)
Chronic disease			-40.313	1.467
			(68.311)	(15.275)
Married			-39.662	-13.069
			(73.203)	(29.998)
Family Size			21.604	.731
			(33.39)	(12.011)
Female			136.233	11.177
			(112.661)	(28.811)
Total expenditures			.174**	.052**
			(.082)	(.024)
Total income			.122	.039
			(.109)	(.038)
			(.115)	(.039)
Constant	94.175***	105.476***	2588.378	499.159
	(16.9)	(18.944)	(1911.437)	(414.517)
Observations	4311	4311	4311	4311
R^2	.002	.007	.421	.352

Notes: FE stands for Fixed Effects regressions. TWFE stands for Two-Way Fixed Effects regressions. The dependent variable in columns 1-3 is the average monthly total out-of-pocket health expenditures of the household. In column 4 the OOP health expenditures are expressed at the individual (adult equivalent) level—a measure which takes into account the family size and the age distribution within the household. The expenditures are expressed in GEL of Q4/2012. "After" is a dummy variable that takes on the value 1 if the observation comes from Q3/2013. Other control variables include interaction terms of 'After' with each of the included controls. Individuals or households who have been privately insured at any time (in Q4/2012 or in Q3/2013) are excluded from the sample. Robust standard errors are in parentheses.
**** p<0.02, ** p<0.05, * p<0.10*

Controlling for time trends in health expenditures, as well as allowing for flexible time trends in the effects of control variables, yielding the most flexible specification in columns (3 and 4), show that the introduction of universal healthcare program reduced the monthly health expenditures of the previously-non-insured households by 91.8 GEL, relative to other households who have been always covered by some sort of a public health plan. This is roughly equivalent to a 24.1 GEL reduction per individual, as seen in column (4). The effects are statistically significant at all conventional levels. The signs of the coefficients of most other control variables mostly agree with previous findings, but are statistically insignificant for the most part—except for total expenditures which was a statistically significant positive effect in all estimation variations and specifications; families who generally have larger expenditures also spend more on health services.

The estimated effects of UHC are genuinely causal because they capture the changes in expenditures for the very same people who actually changed status from "not-insured" to "publicly insured" (UHC plan), while accounting for any secular trends in health expenditures within the year. Trying to estimate the effects of UHC by comparing overall expectations of expenditures before and after the introduction of UHC—that is, comparing the overall average household health expenditures in Q4/2012 with the average health expenditures in Q3/2013, without distinguishing between the people who changed status (from no insurance to publicly insured) from the rest, will yield a correlation measure between the expenditures and the introduction of UHC, but not a causal effect.

This exercise is done by running OLS regressions, without fixed effects—hence covering bigger samples of all households, not only the matched sets of households—on public health status and the other control variables used earlier. Even when limiting the sample for the matched households, but without distinguishing the switchers from the stayers, we still get a correlational, not causal,

estimate of the change in OOP due to the UHC introduction. These exercises are reported in Table A2 of the appendix, which show a *positive,* yet statistically insignificant, estimate (an increase in OOP expenditures when joining a public health plan).

While the simple OLS estimation is *not* measuring the effect of UHC on OOP expenditures, still we can learn from the positive, yet small, estimates of the coefficient of "public" that on average, for the overall population, automatic coverage by the UHC plan increased people's spending on health services—even though the truly affected ones are paying much less for these services. It might be that the very free and automatic coverage of people encouraged them to utilize health services that were not accessible to them before or that were avoided due to cost considerations. This by itself, if more health expenditures can be a proxy for better health status (as referred to in Erdil and Yetkiner, 2009), might be suggestive that the introduction of UHC contributed to improving health status in the overall population, beside its found contribution in alleviating the costs of health care for the public.

5.1 Robustness checks and the type of health expenditures

Although the share of households who have been privately insured before or after the introduction of UHC is very small, and thus so far have been excluded from the analysis, in this section we include these households in the analyzed samples, and reestimate the main effects of UHC on OOP expenditures. Results of this exercise are reported in Table 4.

Table 4: The effect of public health insurance on OOP health expenditures, including the privately insured people

	(1) FE Household	(2) TWFE Household	(3) TWFE Household	(4) TWFE Adult equivalent
Public	-30.157	-73.693*	-94.18***	-25.964**
	(23.364)	(41.606)	(39.818)	(11.963)
Private	-.012	-14.638	-21.075	-16.509
	(28.138)	(32.486)	(89.255)	(25.942)
After		43.306	99.584	30.093
		(34.165)	(66.154)	(22.19)
Age			-81.005	-16.233*
			(50.921)	(9.22)
Chronic disease			-43.449	.008
			(68.317)	(14.987)
Married			195.564	80.008
			(191.901)	(79.601)
Family Size			40.886	7.211
			(40.661)	(13.924)
Female			388.871*	112.656
			(208.809)	(77.605)
Total expenditures			.145*	.043*
			(.086)	(.023)
Total income			.091	.03
			(.095)	(.033)
Constant	92.944***	101.338***	3255.947	583.824
	(17.091)	(18.372)	(2358.967)	(429.439)
Observations	4708	4708	4708	4708
R^2	.002	.006	.314	.271

Notes: See notes of Table 3. Samples now include people who have been ever privately insured (in Q4/2012 and/or in Q3/2013). Additional control variables, beyond those in Table 3, are the dummy for private health insurance "Private," and an interaction term of that with the variable After. Robust standard errors in parentheses.
**** p<0.02, ** p<0.05, * p<0.10*

As is clear from the table, the effect of UHC on OOP healthcare expenditures is negative and statistically and economically highly significant. At the household level, the UHC plan saved the household 94.2 GEL in healthcare expenditures, which translate to roughly 26 GEL at the individual level. These effects are very similar, and even slightly larger in magnitude, to those shown earlier in the benchmark case of Table 3.

Finally, we estimate the effect of UHC on OOP health expenditures separately for each type of that expenditure: inpatient and outpatient, chronic disease, birth and pregnancy, dental care, preventive care, and therapeutic appliances. The sum of the estimated individual effects of UHC on OOP specific expenditures is equal to the estimated effect on the overall expenditures found

earlier. In column (1) of Table 5 we report the earlier estimates (from Table 3) of the effect of UHC on the OOP overall expenditures (an effect of a reduction of 91.8 GEL), as well as the individual estimation of each type of expenditures in columns 2-7.

As seen in the table, the only highly statistically significant negative effect of UHC on OOP expenditures holds for inpatient and outpatient medical services (can be treated as emergencies or serious medical conditions), an estimated effect of a reduction of 88.2 GEL, which constitutes 96% of the overall effect. This evidence lends support to the hypothesis that UHC actually contributed to public health because it was most effective in serious medical conditions and emergencies, that were probably not aptly treated earlier due to unaffordable high costs of necessary health services.

Table 5: The effect of public health care insurance on OOP health expenditures, by expenditures type

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Overall	Chronic disease	Inpatient & Outpatient	Birth	Dental	Preventive care	Therapeutic
Public	-91.797***	.878	-88.241***	-.327	1.707	-4.231	-1.582
	(36.33)	(7.469)	(36.258)	(3.869)	(1.309)	(3.834)	(1.049)
After	87.853	2.353	57.133	11.829	-.704	17.587	-.345
	(69.156)	(15.043)	(65.958)	(10.164)	(3.503)	(15.213)	(1.81)
Age	-58.404	-.900	-57.294	3.413	.002	-3.459	-.166
	(41.274)	(5.918)	(40.972)	(5.352)	(1.315)	(3.468)	(.336)
Chronic disease	-40.313	39.977**	-66.205	-13.037	-.851	.23	-.427
	(68.311)	(18.012)	(73.374)	(18.593)	(1.664)	(2.094)	(.899)
Married	-39.662	83.278***	-106.058	-15.104	-2.698	2.259	-1.338
	(73.203)	(10.871)	(73.038)	(14.387)	(1.801)	(2.819)	(1.49)
Family Size	21.604	14.366***	-8.29	12.088	1.428	-.374	2.387
	(33.39)	(5.778)	(32.882)	(8.045)	(.94)	(.84)	(1.85)
Female	136.233	67.372***	50.751	-.465	10.462***	7.078	1.035
	(112.661)	(14.081)	(113.93)	(13.321)	(3.28)	(6.529)	(1.68)
Total expenditures	.174**	.01	.168**	.003	0	-.005	0
	(.082)	(.011)	(.082)	(.007)	(.006)	(.005)	(.003)
Income	.122	-.004	.117	.002	.002	.005	0
	(.109)	(.011)	(.108)	(.006)	(.005)	(.004)	(.002)
Constant	2588.378	-120.02	2750.388	-198.761	-12.33	168.549	.552
	(1911.437)	(283.027)	(1893.964)	(272.583)	(66.27)	(169.51)	(14.907)
Observations	4311	4311	4311	4311	4311	4311	4311
R^2	.421	.052	.413	.103	.021	.048	.044

Notes: The dependent variable is the household monthly expenditures on health care (overall in column 1, and on the specific type of health services in columns 2-7). Column (1) represents the case of overall household health expenditures, it is identical to column (3) of Table 3. See notes of Table 3. Robust standard errors in parentheses.
**** p<.02, ** p<.05, * p<.1*

Also, although not statistically significant, the positive effects (increases in costs) for dental services and people with chronic diseases shows that either the UHC program was not fully

inclusive of these services, otherwise not associated with life-threatening conditions, or that it favored more pressing needs of emergency, necessary, or life-saving health products and services.

6. Conclusion

High poverty rates, coupled with the fact that Georgia has been ranked among the highest out-of-pocket (OOP) paying nations for health services, render the accessibility and affordability of healthcare services for citizens and residents of the country severely limited. As a response, in the first two quarters of 2013 the Georgian government introduced, and fully implemented, a universal health care (UHC) plan covering all those not-yet publicly or privately insured. In this study, we estimate the effect of the introduction of this public health insurance plan on the level of OOP health expenditures of households.

Following a set of households observed before and after the proposed UHC plan, comparing the spending of "switchers" (the uninsured before the introduction of the UHC, who became publicly insured after it) with that of "stayers" (publicly insured with any preexisting public plans before the UHC), and controlling for their individual observable and unobservable characteristics, we estimated a negative and significant causal effect of 92 GEL per household/month. This is a major effect, amounting to about 10% of the average household monthly income and 30% of the average per capita monthly income. Further analysis show that most of this reduction (96%) was experienced by those who needed serious inpatient and outpatient health and emergency services, tying the monetary savings with actual health outcomes. Not only did the UHC reduce the OOP health expenditures massively, but it might have actually contributed to the overall public health status of the country and saved lives.

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Appendix

Table A1: Summary statistics, whole gross samples

	No insurance		Public insurance		Private insurance	
	Mean	SD	Mean	SD	Mean	SD
			Quarter 4 / 2012			
Health expenditures (household)	52.83	239.51	79.38	245.24	73.78	139.36
Health expenditures (adult equivalent)	17.33	107.24	28.43	110.91	23.08	49.01
Age	43.60	10.99	57.73	16.36	43.82	11.11
Chronic disease	0.15	0.36	0.38	0.48	0.13	0.34
Married	0.80	0.40	0.83	0.38	0.89	0.31
Urban	0.39	0.49	0.32	0.47	0.60	0.49
Size of household	4.06	1.66	4.04	1.89	3.99	1.46
Azerbaijani	0.06	0.24	0.03	0.18	0.01	0.12
Armenian	0.08	0.27	0.06	0.23	0.02	0.14
Total monthly expenditures	976.10	1338.77	786.04	843.91	1409.33	1002.07
Income	957.33	1347.30	799.94	862.26	1418.80	964.34
Observations	1,213		943		216	
			Quarter 3 / 2013			
Health expenditures (household)			80.54	326.04	86.83	328.61
Health expenditures (adult equivalent)			25.93	92.26	31.99	123.33
Age			50.21	14.93	46.25	11.09
Chronic disease			0.27	0.44	0.17	0.38
Married			0.82	0.38	0.88	0.32
Urban			0.36	0.48	0.54	0.50
Size of household			4.02	1.77	3.83	1.49
Azerbaijani			0.05	0.23	0.02	0.15
Armenian			0.07	0.26	0.02	0.15
Total monthly expenditures			869.45	871.41	1418.57	1169.14
Income			891.77	819.68	1572.09	1194.98
Observations			2,155		181	
Total Observations	1,213		3,098		397	

Notes: expenditures and income are all expressed in Georgian Lari (GEL) of Q4/2012, and refer to the monthly average within the quarter. Overall sample size: 4,708.

Table A2: Overall differences in OOP expenditures by public insurance status

	Whole sample	Whole sample	Matched sample	Matched sample
Public	26.545***	15.733	3.921	29.035*
	(10.538)	(12.773)	(25.155)	(15.492)
After	1.157	-38.368	7.457	-112.878
	(10.635)	(44.828)	(21.149)	(103.594)
Age		.487		.072
		(.396)		(.501)
Chronic disease		60.447***		54.676*
		(19.716)		(31.559)
Married		-2.723		-59.381
		(18.742)		(67.659)
Urban		12.139		23.222
		(10.824)		(15.162)
Family Size		-2.251		-9.796
		(4.098)		(13.461)
Azerbaijani		2.635		14.457
		(16.316)		(43.791)
Armenian		-28.156***		2.876
		(11.928)		(17.922)
Total expenditures		.037**		.067*
		(.018)		(.039)
Income		.01		.086
		(.019)		(.093)
Constant	52.835***	-10.823	70.247***	-5.31
	(6.876)	(12.989)	(23.194)	(29.238)
Observations	4311	4311	970	970
R^2	.002	.170	.0002	.294

Notes: Robust standard errors are in parentheses
**** p<.02, ** p<.05, * p<.1*