The Long-Term Impacts of Access to Health Care during Early Childhood: Evidence from Vietnam

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Extended Abstract

Economists and health researchers have a longstanding interest in studying the extent to which providing access to health care for children can improve their health especially in the long run. It has been long recognized that (1) early childhood is a critical stage of child development as a mild negative health shock during this period can still leave long-term consequences on a child, and (2) timely intervention can mitigate such lasting damages[1]. Subsequently, policies providing access to health care for children, e.g. public health insurance, can play a crucial role in improving population health and reducing health inequities in the long run because they allow children to receive appropriate treatments even if they are unaffordable.

Empirical studies on the causal relationship between access and long-term health, mainly focus on evidence from the Medicaid program in the US[2]. While these studies found that the establishment and expansion of the program improves adult outcomes for those who were eligible for the program at early ages, it is not yet clear whether such findings can apply to other country given how unique the US health care system is. On the one hand, public health insurance may not have any long-term impact in countries where medical prices are not as extreme as in the US, and hence people can still pay for health care even without any insurance. On the other hand, public health insurance may have a greater role in countries where negative health shocks are much more likely to happen to children.

In this study, I investigate the potential impacts of children's access on long-term health in Vietnam through a policy change in 2005 that expanded health care access for young children. Specifically, the country launched a program known as the "Free Health Care for Children under 6" program which fully subsidizes any medical expenses at public health facilities for all children under the age of 6. Because the program is well-known for increasing utilization of health services among the eligible children (Nguyen and Wang, 2012; Palmer et al., 2015; Nguyen and Lo Sasso, 2017), the research question of this study is whether exposure to the program at early age, namely age 0 to 5, affects a child's medical needs *after* they are no longer eligible for the program, namely age 7 to 20. The outcomes of interest are health care utilization as well as out-of-pocket spending for inpatient, outpatient treatment and preventive care. I focus primarily on the effects on inpatient treatment (hospitalization) because it likely reflects changes in individual's health compared to the other two services. I found robust evidence that the program decreases the probability of needing inpatient treatment but I did not find evidence that the program affected any other outcome. As comparison, Wherry et al. (2017) found that the Medicaid program decreases the probability of hospitalization by 7 to 15 percent for adult Blacks.

There are two reasons why studying this program is particularly important. First, the program creates a natural experiment to get at the causal effects of access on long-term health. Specifically, there is variation in exposure across birth cohorts due to the age eligibility rule, and there is also variation in exposure rates across 63 provinces as they rolled out the program at different paces. The causal effect is captured by the

[1] See Almond and Currie (2011); Currie and Vogl (2013); Almond et al. (2017) for an overview of theories and empirical evidence on this topic.

[2] See e.g. Boudreaux et al. (2016); Wherry et al. (2017); Thompson (2017); Brown et al. (2017); Goodman-Bacon (2017) for studies looking at the long-term effects of the Medicaid program. Studies on developing countries tend to focus on short-run effects of access to health care on health and medical needs (e.g. King et al., 2009; Gruber et al.; Fitzpatrick and Thornton, 2018).

relationship between geographical variation in difference in outcomes between the unexposed and the exposed cohorts and the geographical variation in exposure rates. Second, this program provides valuable lessons for both Vietnam and other developing countries. Specifically, millions of children previously uninsured[3] were provided access to free health care through this program. The program also replaced the role of the controversial program Health Care Fund for the Poor (HCFP), which previously covered 18 percent of the young children in the country[4].

In this study, I take advantage of the unusual design of the program for my empirical strategy. Specifically, the program uses a "free health care" card system to keep track of total eligible children in each province in each year for budgeting purposes. However, the program explicitly states that eligible children can receive free health care by presenting their birth certificate to prove their age if they do not have a card. An important implication is that having a free health care card is likely uncorrelated with individual's underlying health, a major difference from having a health insurance card[5]. I assemble a panel sample from the Vietnam Household Living Standard Survey (VHLSS) in 2004 and 2006 (before and after the program took place) to formally test and show that this implication is likely true. It follows that the fraction of eligible children who had a card in each province is also not driven by selection on individual's health at the province level, and hence, is used as a measure of province's exposure rate[6].

Formally, the study employs a difference-in-differences (DiD) approach to estimate the extent to which exposure to the program during age 0 to 5 affects different utilization outcomes at age 7 to 20. The primary data source of this study is the nationally- and provincially-representative and biannual Vietnam Household Living Standard Survey (VHLSS). The main sample is drawn from the 2010, 2012, 2014, and 2016 samples including those who were born between 1995 and 2004. The exposure rates are assembled using the VHLSS 2006 and 2008. The general empirical approach involves estimating the following regression:

$$Y_{b,p,y} = \beta_0 + \beta_1 . E_p \times exposed_b + \mathbf{X_{b,p,y}} . \theta + \gamma_b + \delta_p + \epsilon_{b,p,y}$$

where $Y_{b,p,y}$ denotes the outcome of birth cohort b living in province p and appearing in survey year y, E_p denotes province's exposure rates, $exposed_b$ indicates whether the birth cohort was eligible for the program at any point in life, $\mathbf{X_{b,p,y}}$ is a vector of demographic controls, and γ_b and δ_p denote a vector of dummy variables for year of birth and province. In this model, $beta_1$ is the coefficient of interest as it captures the average treatment effect of the program conditional on demographic controls and unobserved heterogeneity across province and birth cohorts.

I conduct several robustness checks for this model. First, I check the possibility that both geographical variation of exposure and cross-cohort variation of outcomes were both driven by province-specific characteristics in pre-treatment period. To do this, I used the 2004 VHLSS to construct pre-treatment province-specific characteristics, and interact these with birth cohort dummy variables as controls in the original model. Second, I also control for province-specific linear trends in birth cohorts; this is done by interacting the province dummy variable with a birth cohort trend variable. This will control for unobserved heterogeneity arises from birth cohort trends across provinces. Table 1 presents the estimates for the coefficient of interest β_1 for different outcome variables under different specifications. The effect of the program on inpatient treatment is robust across all specifications.

Every DiD model relies on the parallel trend assumption which is outcomes following the same birth cohort trends in the absence of the program. While not included, I estimate the same model using only the unexposed cohorts to show that violation of the assumption is unlikely. Finally, I assemble data on under-5 mortality, 5-year and lifetime migration and found no evidence that the program affects these outcomes; these results suggest that selective mortality and migration are unlikely.

[3]According to my estimation from the national household survey in 2004, up to 75 percent of 6 millions children under 6 years old were uninsured.

[4]Wagstaff (2010) showed that the program only reduced out-of-pocket spending but did not increase utilization. The World Health Organization (2011) reported several problems with this program.

[5]With health insurance, individuals can select into having health insurance based on their health; this is commonly known as adverse selection (**?**). Provinces may also select individuals with better health to award cards if a card is tied to free health care. However, both scenarios are unlikely because receiving free care is not conditional on having a card.

[6]The extent to which this measure is uncorrelated with other province-specific characteristics is also tested extensively in the paper.

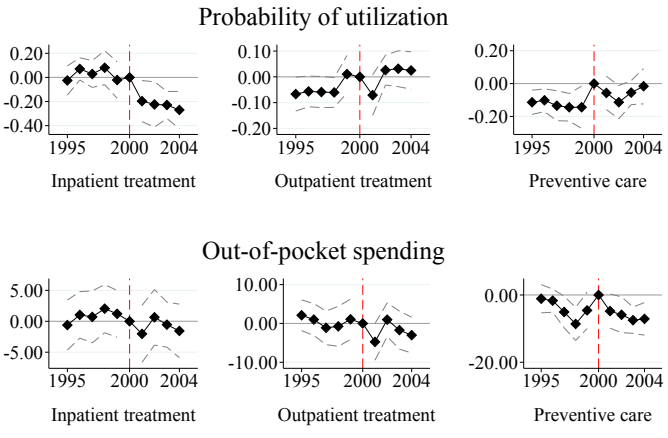
Table 1
Difference-in-differences estimates of effects of exposure to free health care on utilization outcomes.

Dependent variable	(1)		(2)		(3)		(4)	
	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.	Coef.	S.E.
Probability of utilization								
Inpatient treatment	-0.13***	0.05	-0.15***	0.05	-0.13***	0.04	-0.19***	0.07
Outpatient treatment	-0.04*	0.02	-0.02	0.02	-0.01	0.02	-0.01	0.03
Preventive care	0.03	0.02	0.03	0.03	0.02	0.02	-0.07*	0.04
Log out-of-pocket spending per visit								
Inpatient treatment	-1.98*	1.16	-2.13**	1.05	-1.52	1.00	-2.09	2.22
Outpatient treatment	-1.80	1.39	-0.46	1.39	0.25	1.39	0.19	2.39
Preventive care	-0.47	1.23	-0.55	1.31	-0.69	1.22	-2.01	1.74
Additional controls								
HCFP free health care	No		Yes		Yes		Yes	
Province's demographic conditions in 2004	No		No		Yes		Yes	
Province FE x linear trends	No		No		No		Yes	
Observations	2453							

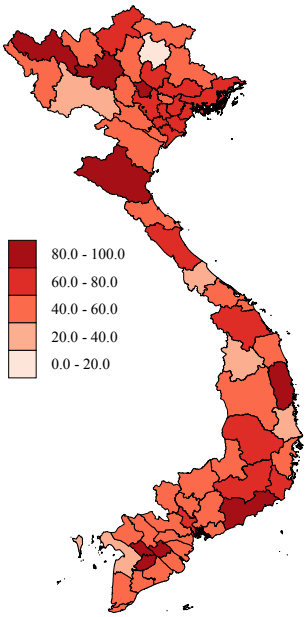
Source: 2010-2016 VHLSS. Data is collapsed by survey year, province of residence, and year of birth using survey weights.

Note: Standard errors are clustered at the province level. *** p < 0.01, ** p < 0.05, * p < 0.1. Table reports estimates for the interaction term between exposure rate and a dummy variable for being born after 2000. Each row corresponds to a dependent variable and each column corresponds to a specification. All models control for province FE, birth cohort FE, and vector of demographic variables - female, age, age squared, urban. Column (2) includes controls for province's proportion of children under 6 who had a HCFP free health care card in 2004. Column (3) also includes controls for province's demographic conditions in 2004: average commune density (households/km2), proportion of poor communes, and proportion of remote communes.

(1) Event study analysis.



(2) Geographical variation in exposure rates.



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