

Quasi-Experimental Approaches to Health and Utilization

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The dissertation consists of an introductory chapter and following five papers on health and health care utilization.

Chapter2: Maternal Labor Supply, Childcare Provision and Child Health: Regression Discontinuity Evidence From Japan

In Japan, mothers are likely to exit from labor market when their eldest child enrolls in elementary school because of many institutional barriers such as shortage of after school childcare. Using the eldest child's enrollment in elementary school as an exogenous shock to maternal labor supply, this paper explores how health of the younger preschool siblings responds to the decreased maternal labor supply. Using a regression discontinuity design, I marginally compare preschool children whose eldest sibling enrolls in elementary school or remains in preschool. The results show the maternal employment rate drops by 4-5 percentage points after the eldest child's school entry. In addition, reduction of maternal labor supply leads to an increase of parental care for the younger siblings. As a result of substantial decreases in maternal labor supply and increasing parental care, the probability of taking a "fever" decreases among the younger siblings, suggesting reduction of maternal labor supply improves child health. However, there seem to be no improvements on the other subjective and objective measures of child health such as the incidence of injuries and hospitalization. Taken together, this paper indicates that the reduction of maternal labor supply is associated with improvement of the health of preschool children, but the magnitude is not large at least in the short run.

Chapter3: The Effect of Patient Cost Sharing on Health Care Utilization among Low-income Children

This paper examines how health care utilization among low-income children is affected by a reduction of the coinsurance rate, exploiting an institutional change in the Medical Subsidy for Children and Infants (MSCI) system in Hokkaido Prefecture, the north island of Japan, as a natural experiment. In 2004, the maximum age for MSCI recipients in Hokkaido Prefecture was raised from 3 years to include all children of preschool age. In this age group, the coinsurance rate was reduced from 30% to 0% in low-income children only, whereas it was reduced from 30% to 10% in higher-income children. As a result, the amount of

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co-payment reduction differed by 10 percentage points between low-income and middle- or higher-income children. A standard *difference-in-differences* technique was applied to analyze the effects of this policy change. The implied arc price elasticity among low-income children is -0.16 , which is congruent with the commonly cited value (-0.2) presented in the RAND health insurance experiment and other experimental studies that cover middle- or higher-income populations. Nevertheless, the behavioral responses to cost sharing were found to differ across a variety of services and children's characteristics.

Chapter4: Does Reduced Patient Cost-sharing Improve Child Health ?

Although cost-sharing has been widely used in many developed countries to contain health care expenditure, the effect of cost-sharing on health has been still uncertain in general population. In particular, there are little studies on the effect of cost-sharing on child health. This paper investigates whether the reduced cost-sharing leads to an improvement of health status among preschool and school-age children in Japan, exploiting regional disparities in the expansion of municipality-level subsidization program for out-of-pocket expenditure. With the eligibility for this subsidization program, which is named Medical Subsidy for Children and Infants (MSCI), coinsurance rate generally decreases from 30 or 20 percent to 0 percent for outpatient health care services and drug prescription. In order to uncover the impact of this program, I first conducted an original survey for all municipalities to understand time-series evolution of the eligible age for MSCI. The response rate is 55 percent, but it covers 72 percent of the population under fifteen years old. And then, the probability of being eligible for MSCI are calculated by the age, prefecture where a child live and year. These probabilities are matched to child health data from the Comprehensive Survey of Living Conditions from 1995 to 2010. The results show that eligibility of MSCI improves subjective measures of health status among preschool children. Numerically, MSCI eligibility decreases the probability of having any symptoms by 2.8 percentage points among preschool children. On the other hand, I find no such an improvement among school-age children. In addition, this study finds no evidence that supports MSCI expansion reduced hospitalization both among preschool and school-age children. Finally, all the results survive after inclusion of a variety of covariates and subsample analysis which drops prefectures where the response rate for my original survey is low.

Chapter5: 児童手当が両親の心理的健康に与える影響： 中低所得世帯における検証

民主党政権下で 2010 年に導入された「子ども手当」は、手当の財源として各種控除が廃止されたことから中高所得者にはほとんど恩恵のない政策だった。しかし、中低所得世帯では手当の増加額が控除廃止による負担増を上回ったため、ネットでの可処分所得の増加がもたらされたと考えられる。本稿ではそのような流動性の付与が、中低所得世帯の両親の心理的健康にどのような影響を与えたか、日本家計パネル調査（JHPS）を用いて検証した。分析の結果、「子ども手当」導入による現金給付の拡充は両親の主観的健康を有意に向上させたことが分かった。年間 10 万円の現金給付の増加によって、母親が健康状態について「良い」と答える確率は 9% 上昇し、父親や健康状態について「悪い」と回答する確率は 6% 減少して

いた。また、父親では心身の自覚症状を示す指標が改善し、母親では「現在の生活に不満を感じる」と答えるサンプルが有意に減少するなど生活に対する満足度が上昇していることが確認できた。最後に、喫煙、飲酒といった嗜好品の消費行動や日常的な運動などの生活習慣への影響も分析したが、児童手当の影響は全くなかった。

Chapter6: Hospital Response to Financial Incentives: Evidence From Nighttime EMS in Japan

In many countries, reimbursement for hospital care is linked to the number of days a patient stays in the hospital and the “day” is defined as a period from midnight to next midnight. In Japan, this “midnight-to-midnight” method may give an incentive for hospital to make emergency patients arrive at hospital before midnight since number of bed days increases by an extra day for patients who arrive *before* midnight than those who arrive *after* midnight. We test this prediction using the administrative record of all emergency medical transportations in Japan from 2008 to 2011, which contains 2.1 million records around midnight. The results indicate that there is a significant bunching in the number of arrival to emergency hospital around midnight; the number heaps a few minutes before midnight, but suddenly drops just after midnight. Given that the occurrence of emergency episode is random and the density is smooth during nighttime, severe bunching around midnight suggests that hospital care providers shift hospital arrival time of emergency patients forward by hurrying-up to accept them. In addition, we find significant manipulation only in patients with mild and moderate symptom, not in those with severe symptom. These findings are consistent with the fact that financial incentives to prolong hospitalization become weak as length of stay increases. On the patient’s health benefit, it seems to be a plausible conjecture that health outcomes of patients with mild and moderate symptom are not affected by the manipulation, whereas it increases reimbursement for the hospital. Finally, the manipulation is observed in the prefectures where private hospitals mainly provide EMS, suggesting hospital ownership is associated with the manipulation of hospital arrival time. Taken together, our results show the existence of socially wasteful behavior among hospital care providers in Japan and private hospitals are more likely to engage in such a behavior in order to increase reimbursement.