



Effects of universal health insurance on health care utilization, and supply-side responses: Evidence from Japan[☆]

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ABSTRACT

We investigate the effects of a massive expansion in health insurance coverage on health care utilization and supply-side responses, by focusing on universal health insurance introduced in Japan in 1961. There are two major findings. First, health care utilization (measured in terms of admissions, inpatient days, and outpatient visits to hospitals) increased significantly. Second, we also find a supply response but the size of the supply response differs across service types: while the number of beds increases, effects on the number of medical institutions, physicians, and nurses are either negligible or inconclusive. Our results suggest that countries planning a large expansion in health insurance coverage would need to generate sufficient financial resources to cover the surge in health care expenditures, both in the short and long run. Our results also indicate that any slowdown in the supply-side response may constrain the ability of the health care system to meet increased demand.

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1. Introduction

Most developed countries have implemented some form of universal public health insurance system to ensure that their entire population has access to health care. Even the United States, a rare exception, is moving towards near-universal coverage through health care reform.² Despite the prevalence of universal health care, most studies on the impact of health insurance coverage on utilization and health have been

limited to specific sub-populations, such as infants and children, the elderly, and the poor.³

This paper studies the impact of a large expansion in health insurance coverage on utilization and health by examining the case of Japan, which achieved universal coverage for its entire population in 1961. We identify the effects of health insurance by exploiting regional variations in health insurance coverage prior to the full enforcement of universal coverage. In 1956, roughly one-third of the population was not covered by any form of health insurance, and the proportion of the uninsured population ranged from about zero to almost half across all prefectures. Our empirical strategy identifies changes in outcome variables in a prefecture in which the enforcement of universal coverage had a large impact, relative to a prefecture in which the impact was smaller.

This study has several advantages over those in existing literature. First, since universal health insurance was achieved as early as 1961 in Japan, we can examine the impact of health insurance expansion in the long term. Since the effects of such a large policy change may emerge with lags, it is important to examine the long-term impact, in order to capture the overall implication of a large policy change.

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² The Patient Protection and Affordable Care Act, passed in March 2010, imposes a mandate on individuals to either obtain coverage or pay a penalty.

³ Examples of studies that examine specific populations include Currie and Gruber (1996a,b), Hanratty (1996), and Chou et al. (2011), on infants and children; Finkelstein (2007), Card et al. (2008, 2009), and Chay et al. (2010), on the elderly; and Finkelstein et al. (2011), on the poor. An important exception is Kolstad and Kowalski (2012), who examine the impact of the introduction of universal health insurance in Massachusetts in 2006; however, they are unable to explore long-term effects as their data cover only the 3 years following the policy change.

Second, our study of large coverage expansion enable us to examine the case of general equilibrium effects, rather than solely partial equilibrium analysis such as the RAND Health Insurance Experiment (hereafter, RAND HIE). Finally, we provide a more detailed analysis of supply-side responses to large demand shocks by investigating several outcomes that have not been explored extensively in previous studies, such as the number of physicians.⁴

We obtain two key findings. First, we find that the expansion of health insurance coverage results in large increases in health care utilization, measured in terms of admissions, inpatient days, and outpatient visits to hospitals. For example, our estimates suggest that the introduction of universal health insurance increased inpatient days by 7.3% and outpatient visits by 12.6%, from 1956 to 1961. The long-term impact is even larger: the estimated increase in inpatient days and outpatient visits from 1956 to 1966 was 11.6% and 25.1%, respectively.

Second, we find that supply-side responses to demand shocks differ across the types of services supplied. While the expansion of health insurance coverage did not increase the number of clinics and nurses even in the long term, the number of beds increased in response to the expansion in health insurance coverage. Our results on the number of hospitals and physicians are mixed and sensitive to the way in which we control for regional time trends. We observe a robust positive effect only on the number of beds; probably because it is less costly for existing hospitals to add beds than for new hospitals and clinics to pay large fixed costs to enter the market. The response of the number of physicians and nurses is weaker possibly because their supply is limited by the capacity of medical and nursing schools. Furthermore, we find that even the number of beds increased at a slower rate than increases in health care utilization.

This paper is related to several strands of literature. The first relevant body of literature comprises studies on the effects of health insurance on utilization and expenditure. The pioneering works of the RAND HIE typically find modest effects of individual-level changes in health insurance on health care utilization and expenditure (Manning et al., 1987; Newhouse and the Insurance Experiment Group, 1993). In contrast, Finkelstein (2007) examines the impact of the introduction of Medicare in 1965, and finds a much larger effect on aggregate spending than that predicted by the RAND HIE, by virtue of individual-level changes in health insurance. Finkelstein (2007) attributes this larger effect to a shift in supply induced by market-wide changes in demand. Our study of large coverage expansion also examines the case of general equilibrium effects, rather than partial equilibrium analysis such as the RAND HIE.

This paper is also related to a growing body of literature that examines the effect of a large health insurance coverage expansion on various outcomes in developing countries such as Mexico, Colombia, Thailand, and Taiwan.⁵ Under significant credit constraints in developing countries, health care utilization without insurance can be inefficiently low (Miller et al., 2009). Japan's per-capita gross domestic product (GDP) in 1956 was about one-quarter of that of the United States at that time.⁶ Thus, our estimates may be more relevant to developing

⁴ For example, Finkelstein (2007) finds a large increase in hospital employment in response to the introduction of Medicare in the United States, but her data do not include most of the physicians, because physicians in the United States are not directly employed by hospitals. On the other hand, our data cover all physicians who were working at hospitals in Japan.

⁵ For example, see King et al. (2009) for Mexico; Miller et al. (2009) for Colombia; Cataife and Courtemanche (2011) for Brazil; Dow and Schmeer (2003) for Costa Rica; Hughes and Leethongdee (2007), Damrongplisit and Melnick (2009), and Gruber et al. (2012) for Thailand; and Chen and Jin (2010) for China. There are a considerable number of studies on Taiwan; see, for example, Chen et al. (2007), Chang (2011), and Chou et al. (2011). Studies on Taiwan also examine the effect of the introduction of universal health insurance; however, the empirical strategy of those studies mostly relies on difference-in-difference approaches, by comparing those previously covered to those recently covered. Such a strategy may not be able to capture the effects through market entry, as argued in Finkelstein (2007), unlike our case, which relies on prefecture-level hospital data.

⁶ Countries whose per-capita GDP is about one-quarter of that of the United States today include, for example, Chile and Turkey. Also, Japan's average life expectancy at that time was 66, whereas that of the United States was 70.

countries that are currently considering a massive expansion in health insurance coverage than to those of existing studies on developed countries such as the United States.⁷ Our results show that countries planning to drastically expand health insurance coverage need to set aside enough financial resources to cover the anticipated surge in health care expenditures in both the short and long run. Another implication of our results is that a slow supply-side response can constrain attempts to meet the demand increase induced by large policy changes.

The rest of the paper is organized as follows. Section 2 briefly reviews the history of Japan's universal health insurance system up to the 1960s, and describes our simple conceptual framework. Section 3 describes the data we use, and Section 4 presents the identification strategy. Section 5 shows the main results for utilization. Section 6 analyzes the supply-side responses to changes in demand. Section 7 concludes the paper.

2. Background

2.1. History of health care system in Japan⁸

Japan's public health insurance system consists of two parallel subsystems: employment-based health insurance and the National Health Insurance (hereafter, NHI). Combining the two subsystems, Japan's health insurance program becomes one of the largest in the world today, covering nearly 120 million people, and making it almost three times as large as Medicare in the United States, which covers 43 million people (The Centers for Medicare and Medicaid Services, 2010).

Employment-based health insurance is further divided into two categories: employees of large firms and government employees are covered by union-based health insurance, whereas employees of small firms are covered by government-administered health insurance. In both cases, employers must contribute around half of the insurance premiums, while the other half is deducted from employee salaries. Enrollment in the government-administered health insurance program was legally mandated for all employers with five or more employees, unless the employer had its own union-based health insurance program. If a household head enrolls in an employment-based health insurance program, his or her dependent spouse and children are also covered by the employment-based health insurance.

The NHI is a residential-based system that covers anyone who lives in the covered area and who does not have employment-based health insurance. Therefore, the NHI mainly covers employees of small firms (i.e., fewer than five employees), self-employed workers in the agricultural and retail/service sectors and their families, the unemployed, and the retired elderly. There were 4,877 municipalities in Japan as of 1955 (i.e., about 106 per prefecture on average), and each municipality is responsible for management of the NHI. An important feature of our identification strategy is that the decision to join the NHI system is left to municipalities, not individuals, and individuals living in covered municipalities cannot opt out.

Both health insurance programs offer similar benefits and cover outpatient visits, admissions, diagnostic tests, and prescription drugs. However, different coinsurance rates are applied, depending on the type of insurance. Also, the rates have changed several times. When universal health insurance was achieved in Japan in 1961, the coinsurance rate for the NHI was 50% for both household heads and other family

⁷ Of course, the technology available at that time was quite different from that available now. However, the major causes of death in Japan around that time were not much different from the causes of death in developing countries now (e.g., pneumonia, bronchitis, gastritis, and duodenitis).

⁸ The discussion in this section draws heavily from Yoshihara and Wada (1999).

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