

The Expansion of Long-term Care Use in Japan: A Case of Supplier-Induced Demand?

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Following the introduction of Japan's long-term care insurance in 2000, long-term care utilization in Japan experienced a remarkable expansion. According to the official statistics provided by Japan's Ministry of Health, Labour and Welfare, total expenditure on care use through the scheme totaled 6.18 trillion yen in FY2004, a 75.4 percent increase over the 3.52 trillion yen in FY2000 which is largely accounted for by the jump in at-home care use. Until 2000, under the "distribution system", only the wealthy were able to afford care services and the market was accordingly small; everyone else was assigned to nonprofit providers as part of the government's welfare policy. However, along with the introduction of the elderly care insurance, the government also encouraged new providers to enter the market and allowed for-profit providers of at-home care for the elderly for the first time (MITCHELL et al., 2004). Aimed at breaking the bottleneck in the supply of care services, deregulation was successful in spurring an increase in the number of establishments providing at-home care from 9,833 in September 2000 to 17,295 four years later.

The simultaneous rapid expansion of supply and demand is often explained by the pent-up demand before the year 2000 that found an outlet following deregulation. However, another possible explanation is that the rapid demand expansion was driven by suppliers. In other words, the growing number of care providers may, in fact, have played at least a partial role in creating demand for their services.

Under the public insurance system, care suppliers are reimbursed on a fee-for-service basis. Prices for each type of service are set by the central government and

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apply to all care providers in Japan. Thus, suppliers face the incentive to increase revenues by stimulating care needs. Moreover, care managers, who are in charge of determining the care needs of each eligible person, may also attempt to increase the demand for the care services of the provider he belongs to. It is therefore possible that care suppliers may be inclined to providing unnecessary care to increase profitability in the face of greater competition in a congested market.

This type of supplier moral hazard, also labeled supplier-induced demand (SID) has been widely discussed in the health economics literature. It is typically the result of the information asymmetry between the supplier and the customer/patient that springs from suppliers' specialized knowledge and that generates the opportunity for providers to create unnecessary needs. Yet, even though there is a substantial body of research on this issue, whether SID exists and, if so, what its magnitude is, remain moot points. For example, although a considerable number of studies suggest supplier-induced demand may be prevalent, few have succeeded in clearly distinguishing whether an increase in demand was the result of SID or patient preferences. A greater number of suppliers, on the one hand, invites the possibility of SID; but on the other, it also affects patient preferences through lower access costs (McGUIRE, 2000). One effective way to discriminate between supply-side and demand-side factors is to use a two-part model. Such a model divides the determinants of medical expenditure into two components: the fraction of the population receiving medical services (= probability) and the medical costs per patient.

The purpose of this study is to apply such a two-part model to a rich micro-level dataset based on the "Survey of Long-term Care Users" in order to examine whether there is any evidence of SID in Japan's at-home care market. To our best knowledge, this is the first study to use micro-level survey data to examine SID in the elderly care market and apply the two-part model to distinguish between client-induced demand and SID. The "Survey on Long-term Care Users", on which our database is based, was performed in 2001, 2002 and 2003 by the Cabinet Office, Government of Japan. The survey subjects were picked from among the respondents to the survey of a private research company. They were randomly chosen based on the household registration system and the distribution resembles the census data. Households contained in the "Survey on Long-term Care Users" are those that have a care receiver living at home, i.e., households with an institutionalized care receiver are not included. The sample in this study includes both care receivers entitled to care services through the long-term insurance scheme as well as those who are not covered by the scheme.

For the first survey, conducted in 2001, the research company that conducted the survey on behalf of the Cabinet Office mailed the questionnaire to 1,300

households and received responses from 1,005 (for a response rate of 77.1 percent). For the second survey in 2002, households surveyed in 2001 were contacted again, of which 617 responded and still had a family member receiving at-home care. In addition, 457 households were newly chosen in 2002. Thus, the sample size for 2002 is 1,074 households. The third survey was implemented in December 2003. Of the households surveyed both in 2001 and 2002, responses were obtained from 381 households who were surveyed in both years and from 251 households who were first surveyed in 2002. In addition, responses from 349 households which were newly chosen are available. Thus, the sample size for 2003 is 981 households.

The respondents to the survey were the main caregiver in the household. The questionnaire covers a variety of items, including the health condition of caregivers and receivers and household demographics. We only use the 2002 and 2003 survey results because the number of care providers at the prefecture level is not available in 2001 and because we need lagged income and assets data in order to avoid possible endogeneity in the estimation. Confining our observations to those households for which all necessary data for our estimation are available, the sample size for FY2002 is 620 and that for FY2003 is 624. In both surveys, the proportion of those who receive at-home care services is about 60 percent, while the remaining 40 percent are cared for by family members. The amount of monthly out-of-pocket expenditure on care services in the two surveys is in the range of 12,000 to 13,000 yen. The average age of care receivers is above 80, and more than 70 percent are female. Those persons with care level 2 or 3 occupy about 40% of the total samples. The diseases responsible for the initial care needs are mostly age-related such as frailty, bone fractures, dementia and brain vein disease. On average, a patient in the sample goes to hospitals or clinics three times per month and his out-of-pocket medical expenditure is more than 4,000 yen. As regards a household's economic status, the most frequent bracket for annual household income is 4–6 million yen and that for household assets is 30–50 million yen.

As regards the density of care providers, we use the number of at-home care establishments per eligible patient at the prefecture level as our density measure. This information is available as of the end of September of each year in the "Survey on Care Service Institutions and Establishments (Kaigo Service Shisetsu Jigyosho Chosa)", which is compiled annually by Japan's Ministry of Health, Labour and Welfare. This survey collects information from all care providers throughout Japan, which is available at the prefecture-level. The number of care establishments is the sum of establishments that provide home-visit services, home-visit bathing, home-visit nursing, and day care services. The average

number of care providing establishments per person is 0.009. In other words, an establishment on average has 100 customers. The proportion of for-profit operators in all establishments was around a quarter in FY2002 and increased to more than 30% in FY2003.

We adopt the two-part model to identify care receiver-induced demand and supplier-induced demand. We calculate the proportion of at-home care receivers where these are defined as any person who receives any kind of at-home care service, including home-visit services, home-visit bathing, home-visit nursing, home-visit rehabilitation, or day care services. Similarly, care expenditure is defined as the payment for any of these services.

First part – the probability of receiving care services:

$$Y_i^* = \varphi_0 + \varphi_1 X_i + \varphi_2 density_i + \varepsilon_i \quad (1)$$

Second part – monthly expenditure on care services per person:

$$\ln(Exp)_i = \varphi_0 + \varphi_1 X_i + \varphi_2 density_i + \varepsilon_i \quad (2)$$

The dependent variable in (1) is a binary variable that takes 1 if a household receives any care services, and takes zero otherwise. The independent variables include household characteristics and the density measure of health care providers as well as dummy variables for the ten regions into which divide Japan in order to capture regional differences (such as between rural and urban regions) in health care use. We perform the probit estimation using cross-sectional data for FY 2002 and 2003 separately.

The dependent variable in (2), on the other hand, is the logarithm of expenditure on care services per month. It is set to be zero if a household did not receive any care services. We estimate specification (2) using the Tobit model to take account of the truncation of the variable. The independent variables in (2) are identical to those in (1) except a variable representing the share of for-profits in the total number of providers was added since for-profit providers may be more inclined to engaging in opportunistic behavior to make a profit (NOGUCHI and SHIMIZUTANI, 2005b).

Our estimation results show that the coefficients on the density intensity measure are not statistically significant, implying that a higher density of health care providers is not associated with a higher probability of receiving care. Moreover, the coefficient on the density measure in the second part is also not significant. In other words, we find little evidence that a higher number of providers per person stimulates higher monthly expenditures on care services. What is particu-

larly interesting is the coefficient on the share of for-profits. This is either insignificant or negative and significant, implying that there is no evidence that for-profits engage in opportunistic behavior that leads to supplier-induced demand in Japan's elderly-care market.

In sum, our study suggests that it is unlikely that the expansion of long-term care use has been caused by supply-side factors. Rather, the release of pent-up demand for elderly care indeed provides a more plausible explanation. Our finding is conflict with one of our earlier studies (NOGUCHI et al., 2005), which found a large amount of supplier-induced demand in Japan in the treatment of heart attacks with high-tech methods. Previous studies on SID have emphasized the information asymmetry between suppliers and demanders. One likely reason why SID is not observed in Japan's at-home care market is that the information asymmetry is not very critical. The health care services involved, such as home-visit bathing, are relatively straightforward and easy for care recipients or their relatives to understand. There is little room for information asymmetries to arise and it is consequently difficult for suppliers to stimulate demand at will.

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