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Does long-term care subsidization reduce hospital admissions and utilization?☆

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ABSTRACT

We use quasi-experimental evidence on the expansion of the public subsidization of long-term care to examine the causal effect of a change in caregiving affordability on the delivery of hospital care. More specifically, we examine a reform that both introduced a new caregiving allowance and expanded the availability of publicly funded home care services, on both hospital admissions (both on the internal and external margin) and length of stay. We find robust evidence of a reduction in both hospital admissions and utilization among both those receiving a caregiving allowance and, albeit less intensely, among beneficiaries of publicly funded home care, which amounts to 11% of total healthcare costs. These effects were stronger when regions had an operative regional health and social care coordination plan in place. Consistently, a subsequent reduction in the subsidy, five years after its implementation, is found to significantly attenuate such effects. We investigate a number of potential mechanisms, and show a number of falsification and robustness checks.

1. Introduction

Healthcare systems face the challenge of responding to the rising costs of health care treatments, which are in part driven by an increasingly ageing population (Breyer et al., 2010). However, part of this rise in the demand for healthcare is argued to be due to an inefficient use of health services (especially hospital care) by those patients in need of long-term care (LTC). Such care is often not available because of limited coordination (Mur-Veeman and Govers, 2011; Hofmarcher et al., 2007; Bodenheimer, 2008) and, most commonly, as a result of limited affordability (Costa-Font et al., 2015). However, only limited research has so far focused on the identification of an expansion in the access of affordable LTC from quasi-experimental evidence.

We use evidence from a reform that extended the public subsidization of LTC services in Spain from January 2007 (referred to in Spanish as the *Sistema de Autonomía y Atención a la Dependencia* – SAAD). This unexpected reform both universalized the access to previously means-tested LTC services (to those qualifying after a needs test) and made it more affordable. One of the reform's advantages is that SAAD was heterogeneously implemented in each region (e.g., differences emerged in the stringency of needs tests, diversity in co-payment rules, etc.), which allows a reasonable identification of its effects on hospital admissions at both the intensive and the extensive margin (i.e., the probability of hospitalization and the number of hospital admissions), as well as utilization (i.e., hospital length of stay – LoS). An additional advantage of the estimates from the implementation of SAAD is that it offers a second experiment to test the reform's robustness in terms of the reduction in the subsidy in 2012 (amid austerity cuts). Finally, given the regional decentralization of the Spanish healthcare system, we have been

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able to further examine the heterogeneous effect of SAAD in regions with pre-existing coordination plans.[1] Given that SAAD provides both in kind (by extending the network of home healthcare), and in cash subsidies (by providing a caregiving allowance), we have been able to study whether the subsidy exerted heterogonous effects depending on the subsidy format.

We draw upon data from the Survey of Health, Ageing and Retirement in Europe 2004–2013, which contains a rich set of time-varying controls, both at individual and regional level. We can use these to measure social and health-related needs.[2] In addition, we have carried out a simple micro-simulation exercise to measure the effect the extension of the LTC subsidy has had on hospital costs. Finally, we have further examined a number of mechanisms that drive our results. Specifically, we describe and test the effect SAAD has on preventing hospital admissions, and specifically on early discharge, thereby reducing LoS. This is important as there were no major reforms in hospital care in the period examined.

Our research extends the previous literature in three ways. First, unlike most previous studies, our estimates are based on quasi-experimental evidence. Second, we examine a number of potential individual-level mechanisms, such as the early detection of symptoms, the prevention of unmet needs (Kemper et al., 2008; Rice et al., 2009), and the provision of a smoother transition of care from hospital to home,[3] income, and housing quality. Third, we can distinguish the effect on hospital admissions and LoS. During the early post-discharge period, defined as the first three to five weeks, approximately 20% of the oldest patients experience adverse events (Forster et al., 2003) that could lead to readmissions (Naylor et al., 2007). These effects can be significantly improved with additional support, and there is specific evidence to suggest that family caregiving improves patients' reported success after hospital discharge and suitable outpatient medication (Bragstad et al., 2012; Scheurer et al., 2012), and that the use of home care by the vulnerable population may reduce the number of hospitalizations (Konetzka et al., 2012).

Our results suggest that after the implementation of SAAD there is a reduction in hospital admissions (in both the intensive and the extensive margin) and utilization (LoS). We find a higher reduction in the number of hospitalizations among those receiving a caregiving allowance compared to those receiving subsidized home care. Conversely, hospital LoS was shorter among those receiving home care services. Our estimates reveal a greater effect among regions with prior health and social care coordination plans. Finally, we examine certain specific mechanisms driving the effect, such as an increased use of outpatient care, the adoption of housing alterations, or the reduction in perceived loneliness and depressive symptoms.

The rest of the paper is structured as follows. The next section describes the literature to which the study contributes. Section 3 describes the background and identification strategy. Section 4 contains a description of the data and variables. Section 5 describes the empirical strategy, and Section 6 contains the key results on hospital admissions, the explanatory mechanism, and the impact on hospitalization costs. Finally, the paper ends with a discussion section containing its concluding remarks.

2. Related literature

The effect of the introduction of social care programs on hospitalizations has so far provided mixed results. Hospital readmissions, a lower rate of hospital-delayed discharges, and lower emergency readmission rates decline after the introduction of a home visits program (Hendriksen et al., 1984 for Denmark; Sands et al., 2006 and Xu et al., 2010 for the US; Tomita et al., 2010 for Japan), although other studies find no evidence of this effect (Balaban et al., 1988; Fabacher et al., 1994, and Stuck et al., 1995 for the US; Van Rossum et al., 1993 for the Netherlands; Pathy et al., 1992 and Hermiz et al., 2002 for the UK). Receiving informal care decreases the hospital LoS of US Medicare patients following a hip fracture, stroke or heart attack (Picone et al., 2003). Weaver and Weaver (2014) find that the availability of informal care decreases the average LoS at Swiss hospitals by 1.9 days, although it did not affect the probability of hospital admission.

Another set of studies using a methodology closer to ours draws on quasi-experimental data. Rapp et al. (2015) measure the impact of financial assistance for non-medical care on the probability of requiring emergency care among patients with Alzheimer's disease. They conclude that the beneficiaries of LTC subsidies have a significantly lower rate of emergency care than non-beneficiaries. Holmås et al. (2008) have found that a system of penalties for a non-smooth transfer process from hospital to LTC services involved hospital stays that were shorter by approximately 2.3 days. However, the withdrawal of the penalties led to hospital stays that were three days longer. Our study described below seeks to fill some of the gaps in the literature, and as in previous studies it draws upon individual data to study hospital admissions (Norton and van Houtven, 2004; Card et al., 2004; Nielsen, 2016; Geil et al., 1997).

Finally, some of the literature related to our study examines the effect of improvements in integration and care coordination on healthcare use. Health and social care coordination is found to improve an individual's quality of life (Hofmarcher et al., 2007), without a significant cost increase (Singh and Ham 2005). However, the effects on hospital admission are not always consistent across different programs. We add to this literature by examining a unique reform that extends the subsidization of LTC, and hence also provides an exogenous variation in the access to affordable LTC.

3. Background and identification

3.1. Public insurance expansion

Spain's 'Promotion of Personal Autonomy and Care of Dependent People', Law 39/2006, was passed on December 14, 2006 and enacted in 2007 (we refer to it using its Spanish acronym SAAD). The reform was effectively an unexpected expansion of public funding (the outcome of a last-minute political agreement by different political groups supporting a minority socialist government elected after the 2004 Madrid bombings[4]).

Before the introduction of SAAD, the provision of LTC was means-tested and funded by local authorities. Access to different social services (home care, day centers and nursing homes) was conditional upon the score obtained on a rating scale that considered various characteristics (age, disability status, income, and family situation). The weights assigned to each characteristic were different across regions.[5] In turn, the social security system was

[1] Prior evidence for Spain suggests that about 68% of all patients needing social care end up being treated by health services, and care management coordination can bring savings of up to 27% (Garcés et al., 2006).

[2] Administrative data do not allow controlling for important socioeconomic characteristics (income and wealth) that are key to understanding the effects of LTC subsidisation.

[3] The availability of formal and informal caregivers may provide some post-acute care at the patient's home, and thus reduce hospital LoS.

[4] Spain's LTC reforms were introduced by a government formed by a parliament elected three days after the 2004 Madrid bombings (García-Montalvo, 2011). The new minority socialist government anticipated an agreement toward the end of 2006 to implement a tax-funded subsidization of the LTC system. It is therefore plausible to assume that the reform was not expected.

[5] IMSERSO (2004).