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Higher prices, higher quality? Evidence from German nursing homes☆

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A B S T R A C T

Objectives: This study investigates the relationship between prices and quality of 7400 German nursing homes.
Method: We use a cross section of public quality reports for all German nursing homes, which had been evaluated between 2010 and 2013 by external institutions. Our analysis is based on multivariate regressions in a two stage least squares framework, where we instrument prices to explain their effect on quality controlling for income, nursing home density, demographics, labour market characteristics, and infrastructure at the regional level.
Results: Descriptive analysis shows that prices and quality do not only vary across nursing homes, but also across counties and federal states and that quality and prices correlate positively. Second, the econometric analysis, which accounts for the endogenous relation between negotiated price and reported quality, shows that quality indeed positively depends on prices. In addition, more places in nursing homes per people in need are correlated with both lower prices and higher quality. Finally, unobserved factors at the federal state level capture some of the variation of reported quality across nursing homes.
Conclusion: Our results suggest that higher prices increase quality. Furthermore, since reported quality and prices vary substantially across federal states, we conclude that the quality and prices of long-term care facilities may well be compared within federal states but not across.

1. Introduction

An ageing population poses severe challenges with respect to financing and securing high quality long-term care. Long-term care is among the fastest growing branches of health care markets. For instance, in Germany, it increased from 8.6% of total health care expenditure in 1997 to 11.2% in 2013 [1]. While prices and quality vary substantially across nursing homes [see, e.g., [2]], they may also be interdependent [3]. On the one hand, higher prices may facilitate higher quality. On the other hand, since nursing homes can be classified as experience goods, high prices

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may be used to signal high quality irrespective of its actual level [4].

In this study, we exploit transparency reports, i.e., the quality report cards of 7400 nursing homes in Germany, which were published between 2010 and 2013. Some studies for Germany have already described the relationship between nursing home prices and quality [2,5,6], however, without looking at the variation across federal states and without considering competition between nursing homes. Both [6,2] find positive correlations between (some) quality measures and prices. Other find some quality indicators to be positively correlated with prices while others do not show any significant effect [5]. [7] explains differences in remuneration rates across German federal states, yet without controlling for quality differences. Looking at Medicaid reimbursement rates, [8,9] find an effect of higher reimbursement on staffing ratios but not on outcomes, while [10] also shows a small increase in an outcome-oriented quality measure. [11] shows that quality differs significantly by ownership type. For-profit nursing homes provide lower quality than non-profit nursing homes in Germany independent of prices charged. Unlike these studies, the following analysis looks at quality conditional on prices and differentiates across federal states.

This study draws from [3] by using a two-stage least squares approach which instruments nursing home prices in the quality equation. They find that competition reduces prices which pushes down quality in English nursing homes.

We add to previous insights by investigating the relationship between prices and quality controlling for a large set of regional characteristics including income, nursing home density, demographics, and infrastructure. First, we show descriptively that quality and prices vary substantially across nursing homes, counties and federal states. Second, we find that quality indeed causally depends on prices in a two-stage least squares framework, which accounts for the endogenous relation between negotiated price and reported quality. Moreover, a county's higher number of places in nursing homes relative to people in need is associated both with lower prices and higher quality. Thus, more resources spent to build up capacities in those counties may contribute to higher average quality. Additionally, we find that unobserved factors at the federal state level explain a substantial part of the variation of reported quality across nursing homes.

2. Institutional background

Health insurance and long-term care insurance are mandatory in Germany and are offered as one package both in the private and the statutory system. Of all insured, 54% belong to health insurances organised at the federal state level [12], while the remaining health insurances are organised at a different regional or at the national level.

In principle, there is no regulated upper limit for the price that nursing homes may charge. However, prices cannot be set freely but are negotiated for a certain time (at least one year) between each provider and the affected sickness funds (§85, SGB IX) of the provider's residents. In a second step, contracts between nursing homes and residents are individually agreed on. Formal care is partly financed by the health plan and partly out-of-pocket. If the residents (or their families) cannot afford it, social welfare covers the private share of the price. The part paid by the long-term care insurance is constant across federal states and nursing homes and only depends on the care level of the individual in need.

The care level is set by the regional Medical Review Boards (MRB) of the German Statutory Health Insurance after an examination of the individual's needs. The MRBs are organised at the federal state level with three exceptions: North Rhine-Westphalia is the largest state in terms of population and is thus split into North Rhine and Westphalia-Lippe, while Schleswig-Holstein and Hamburg as well as Berlin and Brandenburg are organised in one MRB, respectively. In our analysis, we split the federal state effect of North Rhine-Westphalia into two regional binary indicators and combine Schleswig-Holstein and Hamburg as well as Berlin and Brandenburg accordingly to control for the impact of the respective MRB together with many other unobserved factors at federal state level (e.g, education or other political decisions).

In 2008, the "care transparency agreement (CTA)" (*Pflege-Transparenzvereinbarung*) was introduced to increase transparency regarding the services offered and the quality of the nursing homes. The evaluation process is carried out by the regional MRBs. Trained representatives of the independent MRBs evaluate all nursing homes regularly. The same 64 criteria are tested in all nursing homes and the reporting of the results is standardised. The results of each evaluation are published in online report cards (for instance, at www.pflegelotse.de or www.bkk-pflegefinder.de), where only the latest report is available. For a more detailed discussion of the chances and drawbacks of the German transparency reports we refer to [13].

3. Estimation strategy

In the following, we present our econometric approach to study variation in nursing home quality. In particular, we estimate the quality of nursing home i as a function of its average price, its size and regional characteristics at the county level, such as income, supply density, demographics or infrastructure. We apply a two-stage least squares framework [using the ivreg2 STATA-command by [14]]. Due to reverse causality problems and possible unobserved factors influencing both, quality and price, we follow [3] and instrument the price in the quality regression. That is, we estimate a first stage in which we regress the endogenous price on all control variables as well as three exogenous instruments. Since prices are negotiated with the payors for a specific period (at least one year) and are (at least partly) not dependent on the resident (the same price for housing and investments applies to all residents), prices are less adjustable than quality in the short run. Furthermore, the price serves as an important policy variable and can be adjusted according to the respective goals in the negotiations, while quality is more difficult to regulate and monitor. In the second stage, the predicted price, which is now independent of unobserved correlations between