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# An instrumental variables approach to post-acute care nursing home quality: Is there a dime's worth of evidence that continuing care retirement communities provide higher quality?

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ABSTRACT

For the affluent elderly, continuing care retirement communities (CCRCs) have become a popular option for long term care and other health care needs related to aging. While CCRCs have experienced significant growth over the last few decades, very little is known about the quality of care CCRCs provide. This paper is the first to rigorously study CCRCs on a national scale and the only study that focuses on nursing home quality. Using a national sample from 2005, we determine if the quality of post-acute care provided by CCRC nursing homes is superior to traditional nursing homes. To mimic randomization of patients, instrumental variables analysis is used with relative distance as an exclusion restriction to handle the endogeneity of the type of facility where care is provided. After adjusting for endogeniety, we find that CCRC nursing homes provide post-acute care quality that is similar or lower to traditional nursing homes, depending on the quality measure.



## 1. Introduction

Long term care is becoming an increasingly important public policy concern given the growth in demand that will be associated with the aging of the "baby boomer" generation. To meet this demand, multiple innovations in providing long term care have been developed. One of these innovations is the continuing care retirement community (CCRC). A CCRC is an organization that provides long term care to elderly individuals through a combination of housing accommodations and health care services that depend on the level of care needed. CCRCs offer a tiered approach to the aging process by facilitating residents' needs, starting with independent living through the continuum of care of assisted living, skilled nursing, and nursing home (NH) care. While CCRCs are an expensive long term care option, CCRCs experienced steady growth over the last few decades. Between 1997 and 2007, the number of elderly individuals in CCRCs more than doubled, from 350,000 to over 745,000. As of July of 2010, there are over 1861 CCRCs in the United States (US Congress, 2010).

Given the rapid growth of CCRCs and expensive cost structure for consumers, it is important to investigate if CCRCs provide superior quality of services compared to traditional provider options. The few studies that look at CCRCs are limited in scope and there are no comprehensive studies that compare CCRCs against other alternatives on a national basis. Furthermore, the Great Recession has depressed housing prices and significantly reduced the value of financial assets, hindering the ability of the elderly to afford the large upfront costs required to enter CCRCs. This has led many CCRCs to seek additional sources of revenues by providing care to residents in the surrounding community. The best example of this revenue seeking behavior is providing rehabilitative services after a hospitalization, known as post-acute or skilled nursing care. By filling empty beds in the NH component of CCRCs with post-acute patients from the local community, the CCRC is able to increase revenue by leveraging their reputational advantage to broaden the base of consumers that demand any of their services. However, CCRCs primarily focus on providing long term care and the ability of CCRCs to provide high quality services to post-acute care patients is questionable.

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This paper is the only study that rigorously examines CCRCs on a national basis and is the first to address any aspect of NH quality. Specifically, we compare the quality of care provided for Medicare reimbursed post-acute care in the NH component of CCRCs to NHs that are not affiliated with a CCRC. We focus on Medicare post-acute care patients for a few reasons. CCRCs locate in more affluent areas, which makes location endogenous and allows CCRC NHs to attract healthier patients. Since distance is an important consideration in the choice of NH services, endogeneity can be addressed with instrumental variables analysis using distance as an exclusion restriction. This distance measure is valid for post-acute care patients because they are admitted from the surrounding community, whereas long term care patients could have transitioned into NH care from other living arrangements within the CCRC. Furthermore, studying post-acute care patients makes it possible to ignore price as a factor in facility choice, as the first 20 days of post-acute care are fully paid for by Medicare.

Since quality is multidimensional, we utilize three clinical measures of post-acute care quality developed by the Centers for Medicare and Medicaid Services (CMS) as part of the national Nursing Home Quality Initiative, which publicly reports NH quality. The findings suggest that distance is a valid exclusion restriction as it significantly affects NH choice and passes standard econometric validity tests. Moreover, CCRC NHs are able to attract healthier and more affluent patients, suggesting that patient selection is an issue. When this patient selection is ignored, results that compare CCRC to traditional NH quality are mixed. CCRC NHs have better outcomes in regards to pressure ulcers, no difference in the delirium quality measure and lower quality in terms of pain management than traditional NHs. However, after adjusting for the endogeneity of being in a CCRC NH, the findings are suggestive of CCRC NHs having similar quality for pain and delirium while having lower quality than traditional NHs in terms of pressure ulcers. This suggests that CCRC NHs may not provide better quality for post-acute care than traditional NHs.

The remainder of the paper is organized as follows: Section 2 provides background information on CCRCs. The empirical strategy is outlined in Section 3. Section 4 discusses the data. The results are presented in Section 5 and Section 6 concludes.

## 2. Background

A CCRC is an institutional setting in which individuals are provided a range of alternative housing options and health-related services related to the aging process on one healthcare campus. Upon entering a CCRC, residents are required to deposit money with the organization, which is used to pay for a host of fees, such as entry fees, monthly fees, and additional charges related to care. Most CCRC residents enter the community by renting an apartment or similar independent living arrangement. As the resident ages, they are transferred to the long term care settings of assisted living and NH care. Additionally, should a resident be hospitalized, many CCRCs also provide post-acute care through their NH components. While most care is focused on residents that have bought into the CCRC system, CCRCs will provide post-acute care to patients from the local community to fill any beds that are unused by CCRC residents.

The majority of post-acute care provided by CCRCs is for people that do not live in the CCRC. For all patients that require inpatient post-acute care, the choice of where to receive treatment is guided by hospital discharge administrators but is primarily determined by patient preferences and bed availability. Patients that are affiliated with a CCRC will prefer to receive care at that CCRC. However, regardless of affiliation, one factor that is not included in this decision process is price. Medicare covers the full cost of post-acute care treatment for the first 20 days for a new episode of care. The majority of patients are discharged before this 20 day period although the average length of stay in 2005 is slightly longer at 26 days (Center for Medicare and Medicaid Services, 2007). After 20 days, the patient is required to pay a copayment which is fixed across the entire country. In 2005, this copayment rate is $114 per day. Therefore, if a patient is expected to stay beyond 20 days, the out-of-pocket costs are the same regardless of where the patient is admitted. Furthermore, many patients have supplemental insurance plans that will partially cover the cost of these copayments.

Very little is known about CCRCs. The literature available about CCRCs is limited in scope, is rather dated, and the issues associated with CCRCs has been largely ignored by economists. What is known about CCRCs focuses on reasons for relocating to a CCRC (Cohen et al., 1988; Krout et al., 1992), services used by residents (Newcomer et al., 1995; Krout et al., 2000), regulation of CCRCs (Stearns et al., 1990; Netting and Wilson, 1994), and financial viability of CCRCs (Cole and Marr, 1984; Ruchlin, 1988; Anderson et al., 2008). Previous studies that analyze medical utilization or health outcomes in CCRCs are limited and mostly focus on differences across CCRCs. Jenkins et al. (2002) use data from 167 individuals in independent living and assisted living arrangements in two CCRCs. They found that participation in discretionary activities is associated with higher quality of life. Young et al. (2010) found that perceived quality is the same for all independent living residents aged 65 and over, but activities of daily living vary by the financial arrangement an individual has with the CCRC.

There are a small number of studies that compare CCRCs to alternative care options, with a particular emphasis on independent living. Ruchlin et al. (1993) used a study sample consisting of 1666 CCRC residents from 20 CCRCs and a matched sample of 1379 traditional community residents. They find that CCRC and non-CCRC residents had similar annual Medicare-covered medical expenditures, but CCRC residents had lower hospital expenditures and higher NH care costs in their last year of life. Newcomer and Preston (1994) compared residents from two CCRCs and community residents of similar age and gender, resulting in a sample of 467 CCRC residents and 518 individuals in the community. They find that CCRC residents have a higher rate of outpatient surgery and a lower rate of hospital admissions. Additionally, CCRC residents are more likely to use a NH unit after a hospital stay or outpatient surgery than non-CCRC residents. These studies are limited in scope, use small sample sizes, and focus on independent living residents. Therefore, there is a need for further development of the understanding of CCRCs and quality.

## 3. Empirical strategy

The objective of the empirical strategy is to determine if there are quality differences between the NHs in CCRCs and traditional NHs. There are multiple empirical challenges in attempting to answer this question, the first of which is location. As pointed out by Norton and Staiger (1994), for-profit hospitals locate in more affluent neighborhoods because they can attract healthier patients. Furthermore, these patients are more profitable because they have private health insurance. The locational differences between for-profit and not-for-profit hospitals could result in finding that for-profit hospitals provide higher quality, even if they do not.

The same issue regarding location arises with CCRCs. CCRCs tend to locate in more affluent areas, giving CCRC NHs the ability to attract healthier patients with higher socioeconomic status. Since higher socioeconomic status is associated with better health outcomes, this patient selection will cause quality regressions