Racial Differences in Health Care: Evidence from the Veterans Health Administration

A number of studies have documented that minorities and in particular blacks have higher mortality and hospitalization rates for chronic conditions. Differences in the outcomes of cardiovascular disorders account for over 40% of this gap. The treatment of cardiac conditions has become the focus of racial disparities research because of their marked effect on morbidity and mortality and the fast advances in treatment practices during the 90s.

The racial composition of hospitals has been shown to influence individual patient outcomes. However the degree of hospital segregation and the socio-economic status of the patient population may be jointly determined by an unobserved factor. This problem has prevented previous studies from drawing robust conclusions about causality.

In 1996 the Veterans Health Administration (VHA) initiated a national reform which shifted the focus from inpatient to outpatient-based care. A number of new outpatient clinics were set up across the country. Using this reform I overcome the endogeneity problem. I use the opening of a new clinic geographically close to an already established center of care to instrument for the racial composition of the old clinic. I use inpatient, outpatient and prescriptions data on veterans diagnosed with Chronic Heart Failure (CHF) and treated at outpatient clinics between 1998 and 2004. I replicate the results obtained by others using their methodology and my data. The empirical results show that accounting for the endogeneity of the clinic's racial composition and including a full set of controls yields significantly different effects of segregation on patient outcomes.

This paper relates to studies by Skinner et al (2005), Barnato et al (2005), Baicker et al (2004) and Nichols (2005). While Skinner et al find that hospitals with a disproportionate share of black patients show consistently worse outcomes, Nichols suggests that physician specialization may lead to better outcomes for minority patients treated in "blacker" hospitals. The present study has two main advantages. The first is in terms of data. All previous nationally representative studies use data from the Medicare FFS file, which does not include data on personal income and excludes about 12% of Medicare recipients who are enrolled in HMOs. The sample used here is nationally representative, yet allows for controls of socio-economic status and patient compliance with therapy at the individual level. The second is in the methodology. I include both time and clinic-level fixed effects to isolate the differential effect of the clinic racial profile on individual outcomes. Moreover, I trace the same patients through all hospitalizations and referrals to specialists. This allows me to construct more accurate proxies for their health status. Finally, I correct for any remaining bias by using instrumental variables. To my knowledge, there are no previous studies that utilize this strategy.

Data:

The data in this study are from the VA Medical SAS inpatient and outpatient datasets, the Beneficiary Identification Records Locator Subsystem (BIRLS) death files, the Enrollment files, and the Veterans Service Support Administration (VSSA) clinic performance measures database. Any hospitalization in a Veterans Affairs or related hospital would be recorded in the inpatient files. All outpatient visits are recorded in the outpatient files. Death data come from the VA BIRLS files, the enrollment files, and the Medicare beneficiary file. The sample comprises all VHA patients who had at least one outpatient visit for Chronic Heart Failure in an outpatient clinic or a VA medical center. These conditions produce a sample of 123000 patients.

Using VA data I avoid some of the common problems with data from private health care providers. Because blacks on average have lower socio-economic status (SES) and tend to delay seeking health care, it is likely that "blacker" hospitals are also "sicker" or poorer hospitals. Even

studies which use data from Medicare claims, suffer from the fact that provider quality is influenced by the financial status of all patients, not only those covered by Medicare. Medicare claims data do not include HMO patients, which may introduce selection bias. The advantage of VA data is that the centralized budgeting system of the VA is government-sponsored, hence the SES of the patients does not influence the resources of the clinic. Financial and other resources are distributed on the basis of the patient load - clinics serving a larger proportion of patients get more funding.

VA data allow me to control for individual income. Income is reported on the enrollment forms each year and is used to determine the patients' priority group and their benefits. There is significant evidence that health improves with income. Having and individual measure of income provides an advantage over studies using Medicare claims data, which do not include such a measure.

The VA outpatient datasets contain data on all co-existing health conditions. To control for health status, I construct a matrix of co-morbidities based on commonly observed co-existing health conditions. These conditions were picked to correspond closely to the Charlson-Deyo index of co-morbidities, which has become the standard reference in the health literature.

Unobstructed access to pharmaceuticals is particularly important for the management of chronic conditions such as Heart Failure. A common drawback of previous studies is that they do not include controls for access to pharmaceuticals. Using VA data alleviates this omitted variable problem. All veterans who utilize the VA healthcare system are eligible to receive prescription medications through VA pharmacies. Based on these data I am also able to construct a measure of patient compliance with prescribed therapy. The pharmacy data also include unique provider identifiers, which allow me to construct a measure for continuity of care.

Methods:

The racial composition of the hospital and hospital performance may be endogenously determined. Blacks may self-select into hospitals on the basis of an unobserved characteristic, which drives both performance and the racial profile of the clinic. Blacker hospitals may be poorer, understaffed, located in worse areas, which are also more likely to be inhabited by minorities.

There are several reasons why health care providers who treat mostly black patients systematically show worse outcomes. First, physicians may be discriminating against black patients and this drives the performance measures. Second, some hospitals are located in poorer areas and draw their patients from the local population. Treatment location is determined simultaneously with the characteristics of the patient's area of residence. Poorer financial conditions of the hospital create worse conditions for both doctors and patients and influence the outcomes measures independently of patients' clinical characteristics. Bias arising from omitted variables cannot be discounted even when we correct for all observable characteristics of hospitals and patients. Dietary behavior, physical activity, tobacco use and drinking, as well as everyday stress are important factors influencing the development of chronic conditions such as CHF.

Individual outcomes are influenced by clinic-level variables such as the segregation of the clinic and the patient load and patient-level variables. Let X_{gtm} be a vector of characteristics for patient m that goes to clinic g at time t. Let Z_g be a vector of clinic characteristics which vary between clinics, but are constant within a clinic. Let B_{gt} be a vector of clinic characteristics which vary between clinic and years, but have the same value attached to patients in the same clinic in the same year. I estimate the following model:

(1) $y_{gtm} = \alpha + \beta X_{gtm} + \gamma Z_g + \delta B_{gt} + \varepsilon_{gtm}$

where y_{gtm} is an outcome at the patient level. I use several outcome measures. First, I test for the probability of hospitalization from any cause in the first year after diagnosis. As an alternative measure I use the number of hospitalizations for any cause in the first year after diagnosis. Next I narrow down hospitalizations to only those that can be directly related to CHF. The last outcomes I use are one- and two-year mortality.

It is possible that some of the unobserved clinic-level variables correlate with the patient-level variables X_{gtm}. I include a clinic-level fixed effect to account for any unobserved clinic-level characteristics which do not vary with time. I include a year dummy to account for unobserved time trends.

(2) $y_{gtm} = C_g + W_t + \beta X_{gtm} + \delta B_{gt} + \varepsilon_{gtm}$

where C_g is a clinic fixed effect and W_t is a year fixed effect. B_{gt} is a measure of clinic 'blackness', equal to the proportion of black patients' outpatient visits over the total number of outpatient visits.

Directly estimating (2) gives a consistent estimate of the blackness coefficient δ if and only if hospital blackness is exogenous. However blackness may be correlated with unobserved determinants of patient outcomes. Hospital or clinic blackness may be determined by patient characteristics:

(3) $B_{gt} = \gamma X_{gtm} + v_i$

Where B_{gt} is the "blackness" of clinic g serving patient m at time t, X_{gtm} is a vector of observed personal characteristics. Since minority status is usually correlated with lower SES, if poorer individuals have a different attitude to health and different health habits, they will have worse health outcomes at any level of hospital blackness. Because they are also more likely to reside geographically close to "blacker" hospitals, we will be attributing the effect of the unobserved differences in health attitudes and practices to "blackness". The OLS estimate of "blackness" will be downward-biased. A consistent estimate of δ can be obtained if there is a component of X_{gtm} which affects "blackness" but not patient outcomes. An instrument is needed which can be legitimately excluded from the estimation of (2).

The VA outpatient reform added a number of new outpatient clinics to the health care system. The largest expansion took place between 1998 and 2002. All clinics opened after 1998 are new, and those who opened in the vicinity of an "old" clinic are used to construct an instrument for old clinic blackness. I use instrumental variables estimation as an alternative to OLS.

Purging the coefficient on the clinic's racial profile from the omitted variable bias leaves two possible explanations for finding a statistically significant δ. On one hand, unobservable provider discrimination may be picked up by the blackness coefficient δ. On the other, there may be specialization on behalf of physicians. Seeing a larger share of black patients may increase the physician's ability of communicate with minorities and raise awareness of certain conditions more common in the black population or treatment practices which are more appropriate for minorities. These effects would have opposite influence δ.

I use the data on providers and prescriptions to construct a measure for continuity of care. Every prescription in the VA system has the id of the provider who called it in. The first continuity of care variable is derived as the ratio of the number of different providers who called in prescriptions for the patient over the total number of prescriptions called in for the patient in a year. For example, if the patient saw two different providers during his 10 visits, he will be assigned a continuity of care equal to 2/10 or 0.2. The higher the ratio of provider changes to total number of prescriptions, the worse the continuity of care for the patient.

I distinguish between different sources of discontinuity. Based on the information on providers, I am able to discriminate between patients who decided to change providers and those who were forced to switch because their primary physician left the location. Another source of discontinuity is a visit to a specialist. The data allow me to flag these cases and differentiate between their effects on outcomes.

I use data on prescription refills to define a measure of patient compliance with therapy. The VA pharmacy data contain a "days supply" variable attached to each prescription, as well as the time when the first dose was dispensed and the time of subsequent refills. Using the "days supply" variable I can determine whether the prescription was refilled on time (on or before the day when the initial supply was depleted). The adherence measure is defined as the number of prescriptions which were not re-filled on time over the total number of prescriptions for the year.

Results:

I replicate the results of previous studies using their empirical approach. I show that when the population is pooled and there are no controls for year and clinic effects the results I obtain are similar to those obtained by others. I then modify the model to include the full set of controls. The effect of black race is still negative and large, however the effect of clinic segregation measured by δ is significantly reduced. In some specifications using the probability of hospitalization as an outcome I obtain positive values of δ. The IV estimates confirm the results from the OLS regressions using the full set of controls.

Conclusion:

This paper offers a robust estimation of the effect of clinic or hospital racial segregation on individual outcomes. The results from a nationally representative sample of veterans show that accounting for clinic and time-specific effects is crucial for obtaining robust estimations. Using a much larger and sharper set of control variables than previous studies, I show that the effect of the racial profile of a clinic's patient population is diminished and in some cases positively correlated with segregation. Provider specialization is one possible explanation for the results.

Selected references:

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