

ЗАРУБЕЖНАЯ СОЦИОЛОГИЯ МЕДИЦИНЫ

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EMERGENCY ROAD TRIPS: AN ANALYSIS OF SPATIAL BARRIERS TO INPATIENT STATE PSYCHIATRIC CARE FOR SELECT U.S. STATES¹

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Background

From its peak in the 1950s, the number of state psychiatric inpatient beds in the United States has decreased steadily. Today, not one U.S. state meets the generally accepted minimum of 50 inpatient beds per 100,000 in the population. Mississippi comes closest at 39.0 beds per 100,000. The last time the inpatient psychiatric bed situation was so dire was 1850 [1], when the plight of the seriously mentally ill first attracted attention in the U.S.

Deinstitutionalization is the result of societal shifts and policy changes over the last half century, and while the effect in the U.S. has been particularly stark, the broader trend is on display in many high income European countries [2].

By the 1970s, psychiatric hospitals had gained a reputation for substandard care, the likes of which was the subject of the 1975 Jack Nicholson film *One Flew Over the Cuckoo's Nest*, which was filmed at Oregon State Hospital in Salem, Oregon. That hospital opened in the mid-1880s and is still in operation despite numerous citations for unsafe conditions and asbestos exposure [3].

Indeed, despite 50 years-worth of closures, many states still operate psychiatric hospital facilities that were constructed more than 100 years ago, and many that were built in the 19th century. This state of affairs is the result of the political difficulties that come with trying to allocate money for new facilities — the public still associates psychiatric hospitals with negative stereotypes from the 20th century.

With state budgets only now starting to recover following the deep economic recession of 2008, resources are not currently available for building the number of new psychiatric hospitals that the country truly needs. However, small steps are possible, and state policymakers need the best available evidence in order to decide where future facilities should be constructed.

Drawing on my past research in this area, this paper analyzes the role geographic distance plays in serving as a barrier to acute mental health care in states with poor mental health outcomes and low inpatient turnover ratios, which taken together suggest unmet need.

This investigation compares three large high performing states, each of which scores in the top 5 nationally in outcome measures, to three large low performing states (each in the bottom 15 in outcome measures), which all score poorly in the “access to care” indicator while nonetheless maintaining below average turnover rates. Additionally, my research looks at Mississippi (the state with the most inpatient psychiatric beds) and California (the most populous state).

Mississippi finishes in the bottom 10 in overall mental health outcomes, while California's scores are almost exactly at the mean.

Literature Review and Methods

Since the debate around, and eventual passage of, the Patient Protection and Affordable Care Act (ACA) from 2008—2010, most research has focused on administrative and economic barriers to care, including insurance coverage, out of pocket costs, and insurance benefit designs. The only recent study to consider geographic barriers to access was published in 2012 and looked at drug abusers trying to access community-based psychiatric care [4].

Aside from that paper, my literature review did not turn up any other studies investigating geographic or spatial barriers to care for patients in need of a state inpatient psychiatric bed.

This study builds on my earlier investigation into the relationship between the number of state psychiatric inpatient beds per 100,000 in the population and mental health outcomes by state. That study revealed that, despite the focus in policy circles on the number of state psychiatric beds per 100,000, the main driver of good health outcomes was treatment mix (state inpatient beds, for-profit and non-profit private inpatient beds, community care, and residential treatment). The highest performing states have crafted treatment mixes that best utilize their existing infrastructure. For states like Oklahoma, that has meant a focus on care coordination in an outpatient setting. Other states rely more heavily on their state psychiatric hospitals and develop community care programs to help drive patient recovery following discharge from an acute setting.

While the previous study provided insight into what factors drive positive mental health outcomes vis-a-vis inpatient care, it also raised new questions about some states. Certain states with what appear, numerically, to be ideal treatment mixes and solid, if unspectacular, capacity nonetheless are among the lowest performing states. Clearly, factors beyond treatment mix and capacity are having a big impact on mental health outcomes in some states.

This study examines three large states — Washington, Oregon, and Arkansas — that score in the bottom 30% in mental health outcomes and have low annual turnover among their state inpatient psychiatric beds, which suggest unmet need within the state.

Serving as a control group are three large states — New York, Oklahoma, and Kentucky — that score in the top 5% in mental health outcomes. Their annual turnover rates vary from low (New York, 2.07) to very high (Kentucky, 15.12). Further, this study also examines California, the largest and most populous state, and Mississippi, a large state with the most state inpatient psychiatric beds per 100,000 in the population (39.0).

Data Sources and Preparation

The analysis was conducted using ESRI's ArcGIS 10.2.2 software with data sourced from Tigerline [5] (state shapefiles divided by zip code tabulation areas, or ZCTAs)

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and American Factfinder [6] (2009—2013 total population estimates by ZCTA for each state). State psychiatric hospital addresses were collected from state government websites [7] and entered into the datasets.

This study draws heavily on data used to inform my previous study, with health outcome figures sourced from SAMSHA survey data, bed numbers sourced from The Treatment Advocacy Center, and population figures sourced from US Census data.

Analysis and Mapping

In ArcGIS, state maps were created with population per ZCTA displayed in seven levels classified according to natural breaks (Jinks). ZCTAs containing at least one state psychiatric hospital are colored red. ZCTAs of which at least part of the territory is within 20 miles (as the crow flies) of a ZCTA with a state psychiatric hospital are covered in red cross-hatches. ZCTAs within 100 miles (as the crow flies) of a ZCTA with a state psychiatric hospital are covered in yellow-orange cross-hatches. Twenty miles is a distance at which the vast majority of the population, regardless of automobile ownership or economic resources, can reasonably be expected to travel to help a loved one in need access acute mental health care. One hundred miles is the greatest distance at which the vast majority of the automobile-owning public can be expected to help a loved one in need access acute mental health care.

Population numbers were totaled for each state, the ZCTAs with state psychiatric hospitals, the 20-mile hotspots, and the broader 100-mile coverage zones. Those numbers were then tabulated for the high performing and low performing states, and the mean figures for each group are compared against the other group as well as California and Mississippi. This study aims to discover a spatial association between the population contained within coverage areas (both at the 20-mile and 100-miles levels) and treatment outcome data, specifically “access to care”.

ZCTAs are utilized as the area of measurement within states because of the ease of access to data and their appropriately small geographic size. Coverage areas were created by performing a ‘Search by Location’ with the “ZCTAs with a State Psychiatric Hospital” serving as the base layer and the “Population by ZCTA” acting as the search by layer. New layers were then created for the 20-mile hotspots and the 100-mile coverage areas. Statistics were tabulated by attribute field and totaled in spreadsheets in Microsoft Excel.

Discussion

This study considers two coverage areas — hotspots within 20 miles of a state psychiatric hospital and larger coverage zones within 100 miles of a state psychiatric hospital. The study shows that although the importance of each coverage area is dependent on state specifics, in general, the 100-mile coverage area determines whether or not distance is an actual barrier to accessing care. Within 100 miles, for most states, the differences in travel time determine the degree of ease of accessing care. However, the data suggests that people in states like New York, which have large urban populations, value the 20-mile coverage zones to a greater degree than other states, perhaps due to the low automobile ownership rate in New York City.

The Access Champions — Kentucky, New York, and Oklahoma

Outside of strong mental health policy, in which all three states score among the top 10% nationally, Kentucky,

New York, and Oklahoma share little in common. One state is mountainous and rural (Kentucky), another includes the most populated city in the country (New York), and the third is a dust bowl state in the southern part of “tornado alley” (Oklahoma).

Each state takes a different route to achieving successful mental health outcomes. Kentucky has built successfully around its state psychiatric hospitals, New York leverages its third-in-the-nation inpatient bed count to patch any holes in its outpatient care, and Oklahoma utilizes coordinated community care to make up for its lack of inpatient beds.

One thing all three states have in common is that nearly all of their citizens are within 100 miles of a state psychiatric hospital. Even Oklahoma, with its statistics-distorting panhandle, includes more than 91% of its residents within the 100-mile coverage zone.

Kentucky

The fact that the state with the highest rating for adult access to mental health care is relatively poor, rural, and mountainous highlights the importance of policy and planning. Kentucky is one of the five highest performing states in mental health outcomes nationwide, but on access, it succeeds in large part due to the spatial distribution of its state psychiatric hospitals, which form the base of its mental health services.

Kentucky has four state psychiatric hospitals, and 46.77% of the state’s population is within 20 miles of at least one of those hospitals. That number is actually below average for this study. Kentucky is mountainous in the eastern part of the state, but does not present any specific barriers to automobile traffic.

Of the states examined in this study, Kentucky’s 100-mile coverage area includes the highest proportion of the population (99.88%). Kentucky also has the third highest percentage of its population living in a ZCTA with a state psychiatric hospital.

Overall, Kentucky has created an acute state psychiatric system that does a good job of locating beds near enough for patients to access them without undue burden. Kentucky has 10.3 beds per 100,000 in the population, which is only 20% of the generally accepted minimal amount necessary, and yet the state has a higher percentage of its population within 100 miles of a state psychiatric hospital than Mississippi, which has four times the amount of beds, controlling for population.

New York

New York’s mental health strategy is clearly influenced by New York City, where nearly one-third of the state’s residents live. Since 56% of New York City households do not have a car, and car ownership rates are also low in other metropolitan areas throughout New York [8], locating state psychiatric hospitals in population centers is crucial to ensuring access to care.

Of the states examined in this study, New York has the highest percentage of its population (77.65%) within 20 miles of a state psychiatric hospital. It is able to achieve this impressive coverage number due to its large urban population and the fact that it has a state psychiatric hospital in every major city in the state.

New York achieves the second highest population rate within the 100-mile coverage zone (99.29%), with only the northeast corner of the state further than 100 miles from any state psychiatric hospital. Parts of the state are mountainous, but overall, there are no major geographic barriers to access.

Oklahoma

Unlike the other two states in the high performing group, Oklahoma does not make its state psychiatric hospitals the core of its mental health system. Rather, the focus is on community outpatient care, with the goal of preventing as many cases as possible from reaching the acute state. This strategy is due in large part to the state only having two state psychiatric hospitals and 10.7 beds per 100,000 in the population.

Only 35.47% of the state's population is located within 20 miles of a state psychiatric hospital, the third lowest percentage among states examined. Still, the two hospitals are located in the middle of the two largest population centers in the state. As the map reveals, the northwest part of the state is sparsely populated, and that is largely the case in the southeast part of the state as well.

Nearly 92% of Oklahoma's population is located within 100 miles of a state psychiatric hospital. Although this total is less than Kentucky and New York, it is still impressive given the fact that there are only two hospitals in the state. Not surprisingly, Oklahoma scores lower on access to care for adults than the other two high performing states: 88 out of 100 (85 is the average). The panhandle in the northwest does present unique challenges and absent locating a new state psychiatric hospital in that portion of the state, which is unlikely given the low population, people in that area are likely to continue to experience a spatial barrier to access. The land is flat, though, with no geographic barriers, meaning the added miles do not present any additional challenges. More concerning is the southeastern-most ZCTAs, which do have some geographic barriers (in white on the maps) to access.

The Underperformers — Oregon, Arkansas, and Washington

Among the 15 states with the worst overall mental health outcomes are Oregon, Arkansas, and Washington. While Arkansas's 7.0 beds per 100,000 in the population likely contributes to its struggles, as a group these three states have a mean of 14.47 beds per 100,000. Again, that is significantly below the minimally accepted amount of 50 per 100,000, but it nearly equals the 15.53 per 100,000 mean of the three high performing states.

While the amount of beds per state, controlling for population differences, is similar between the two groups, they diverge in their coverage areas. On average, 53.30% of the population in the high performing states is within 20 miles of a state psychiatric hospital and 96.90% is within 100 miles. In contrast, only 37.64% of the population in the low performing groups is within 20 miles of a state psychiatric hospital and 75.38% is within 100 miles. That is a difference of 15.66 percentage points in the 20-mile coverage area and 21.52 percentage points in the 100-mile coverage zone. As great as those differences are, they only begin to tell the story.

Oregon

Oregon's three psychiatric hospitals are located in the three population centers in the western portion of the state. The 20-mile hotspots around these hospitals overlap, forming one large coverage area that includes 67.18% of the state's residents, the second highest total of the states examined. There is, however, a major geographic barrier just beyond the 20-mile coverage zone in the east — the Mt. Hood and Willamette National Forests. Very few roads run

through these forests, complicating travel during acute psychiatric episodes [9].

Extending the coverage zone out to 100 miles only covers 82.90% percent of the population. The nearly one-fifth of the state population that is located more than 100 miles from a state psychiatric hospital is spread out over nearly two-thirds of the state's landmass, mostly in the eastern part of the state.

Residents in the northeast corner of the state can drive the nearly 200 miles to the nearest state psychiatric hospital, in Portland, in under three hours, but residents in the southeast quadrant of the state will need at least 4.5 hours to drive the more than 250 miles to the closest state psychiatric hospital, in Salem. Also, a large portion of the population in the eastern part of the state is comprised of Native Americans who live on reservations. These populations have notoriously high rates of mental illness and poverty, further complicating their ability to access care.

Arkansas

Arkansas has only one state psychiatric hospital, and it is located right in the middle of the state. Only 22.15% of the state's population is within 20 miles of the hospital, even though it is located in Little Rock, the capital and one of the state's major urban centers.

Washington is the only other state in which less than 35% of the state's population lives within 20 miles of a state psychiatric hospital. Not surprisingly, annual turnover in Arkansas State Hospital is only 3.35 per bed.

Extending the coverage area out to 100 miles seems to include most of the state's geographic landmass. From a population perspective, however, many people are left far from care. Almost 43% of the state's population is located more than 100 miles from the hospital. Because a large portion of the state's population is located in the northwest and northeast corners of the state, solving the spatial access problem will require the construction of more than one new facility. Thus, improving the state's access to mental health care rating, which currently stands at 74, 11 below the mean, will take time. The low annual turnover rate and high percentage of the population located more than 100 miles from the lone state psychiatric hospital suggests there is significant unmet need for inpatient services in Arkansas. However, as the maps show, there are clear spatial areas to target if and when approval is granted for funding new state psychiatric inpatient facilities.

Washington

Washington has 18.1 beds per 100,000 in the population, but annual turnover is only 2.38 per bed, suggesting a serious barrier to access. SAMSHA surveys confirm the access problem, with Washington scoring 73 out of 100, 12 points below the average.

Washington has two state psychiatric hospitals — one in the western part of the state, in the Seattle area, and one in the Spokane area in the eastern part of the state. The 20-mile coverage zone is nearly identical to Arkansas: 23.59% of the population is within 20 miles of a state psychiatric hospital.

On paper, Washington does much better than Arkansas with its 100-mile coverage zones, which incorporate 86.20% of the population. However, Washington has numerous geographic barriers (water and mountains predominate) that can complicate access for certain segments of the population. Also, unlike Arkansas, the people furthest from a state psychiatric hospital are those who live in the center

of the state. The one benefit for this population is the fact that they are essentially equidistance from both hospitals, so if a bed is available in one and not the other, there is not the stark difference in travel times that people in the eastern or western parts of the state would encounter.

The Curious Case of Mississippi

Although the evidence provided does suggest that spatial and geographic barriers can, in certain states, prove to be barriers to access to acute state psychiatric care, Mississippi serves as evidence that these are not the only possible barriers to access. The state has more beds per 100,000 in the population (39.0) than any other state in the country, and annual turnover is only 2.83 per bed.

More than 3% of Mississippi's total population lives in a ZCTA with a state psychiatric hospital, the highest total of the states examined. In addition, nearly 51% live within 20 miles, which is five percentage points better than the average for all states examined here.

The 100-mile coverage zone includes 97.43% of the state's population, which is higher than the average of the three high performing states. And yet, Mississippi scores only 78 out of 100 in access to mental health care, 7 below the average of 85.

As the maps show, there is no evidence of a spatial or geographic barrier to acute care in a state facility in Mississippi. Many more people than average (3,366 per 100,000) are treated in community settings, so that isn't likely to be dragging down the overall access rating. Rather, the most likely issue is the cost of receiving care in an outpatient center. In 2013, 14% of Mississippians were uninsured, an above-average level, but far below the 20% in Nevada [10]. However, according to 2011 Census figures, Mississippi has the highest rate of poverty and lowest personal incomes of any state in the U.S. [11] Taken together, these numbers suggest that despite state inpatient care being within the physical reach of most people, private outpatient care is not within their economic reach.

What Mediocre Looks Like: California

California scores right at the mean of 85 in adult access to care as well as overall health outcomes (which, in addition to adult and child access to care, includes outcomes from services, participation in treatment planning, and general satisfaction with care for both adults and children). Like the other states profiled, it is geographically large, which increases the likelihood of spatial barriers to care. However, like Mississippi, there is no evidence of a spatial barrier to acute state psychiatric care.

Just under 52% of California residents live within 20 miles of a state psychiatric hospital, and 98.31% live within 100 miles. Most people in California live along the coast, so the mountains and deserts in the eastern part of the state do not hinder many from accessing care. However, there is a notable section of land in the northern part of the state that is more than 100 miles from a hospital. While not many people live in that part of the state, those that do have to travel a considerable distance to reach the state acute care facility in the San Francisco area. Should there not be a bed available at that facility, it is a prohibitively long trip to the next closest state psychiatric hospital in Fresno.

Conclusion

There is evidence of spatial barriers to acute state psychiatric care in Oregon, Arkansas, and Washington, but

not in Mississippi or California. Kentucky, New York, and Oklahoma demonstrate near universal 100-mile access to state psychiatric hospitals, while nearly one-quarter of the populations of the underachieving states of Oregon, Arkansas, and Washington live more than 100 miles from a hospital.

In most cases, a 100-mile drive can be accomplished in two hours or less. A drive requiring any more time can be prohibitive given the fact that the person in need of treatment has, by definition, reached an acute state. This can mean that the person is violent, hallucinatory, or otherwise a danger to him or herself and those around.

Understanding the spatial barriers to care can help inform policymakers of both the need for more state psychiatric inpatient facilities and precisely where those facilities should be located so as to increase access to care for the most people.

Further research should seek to quantify the intersection of poverty and lack of health insurance (which would make treatment in a private inpatient psychiatric facility possible) in the areas affected by spatial barriers to access. In addition, more evidence is needed about specific state populations and their ability to travel 100, and even 20, miles while a friend or loved one in the car is experiencing an acute mental crisis. While 100 miles seems like a logical maximum, this was an arbitrary distance chosen for the purposes of this study. To date, no research has been conducted on the maximum acceptable travel distance for patients in the midst of an acute mental crisis.

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