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Title

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Permalink

Journal

ISSN

Authors

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Publication Date

2018

DOI

Peer reviewed

Medicaid Spending Differences for Child/Youth Community-Based Care in California's Decentralized Public Mental Health System

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Abstract

This study evaluated spending differences across counties during the decade after California decentralized its public mental health system. Medicaid data for 0–25 year olds using mental health services were collapsed to the county-year level (n = 627). Multivariate models with county fixed effects were used to predict per capita spending for community-based mental health care. While counties increased their spending over time, those with relatively low initial expenditures per user continued to spend less than counties with historically higher spending levels. Spending differences per user were most noticeable in counties with larger racial/ethnic minority populations that also had historically lower spending levels.

Keywords

Public mental health system; Medicaid expenditures; Children; Youth; Counties

Introduction

While public mental health systems nationwide have experienced the trends of deinstitutionalization, decentralization, and an increasing focus on maximizing Medicaid funding, these systems still vary greatly in how they are organized and financed (Buck 2003; Frank and Glied 2006). Although it is clear that there are large differences in per capita mental health spending by state (Substance Abuse and Mental Health Services

Administration 2011; Substance Abuse and Mental Health Services Administration 2012), we do not know if localities in a decentralized system can independently address these financial inequities. California's decentralized system can help us understand whether counties with lower spending per capita, which could signify limited resources for and/or limited emphasis on mental health, leverage flexibility to change their spending relative to other counties or whether financial disparities persist. In this study, we tested the hypothesis that counties with historically lower expenditures per user and more racially/ethnically diverse populations would experience the slowest growth in expenditures for community-based care as compared to other counties, after controlling for county mental health system and county sociodemographic characteristics. We discuss this trend in the context of institutionalized financial constraints and difficulty in attracting racial/ethnic minority children and youth to community-based services.

California has 58 counties, with 57 county mental health departments as two counties share a department. These county-based systems began between 1957 and 1972, after the Community Mental Health Service Act (or Short-Doyle Act) passed (Community Mental Health Service Act 1957). Whereas the initial share of costs for county mental health programs was 50 % state and 50 % local, the state share grew to 75 % in 1963 and to 90 % in 1969 (Frank and Gaynor 1994). This 90-10 state-to-county match lasted until 1991, when counties were granted major control of their public mental health systems. In 1991, legislation was passed that devolved mental health, social, and health service program responsibilities from the state to the counties (Department of Mental Health 2003; Legislative Analyst's Office 2001). Through this "Realignment," counties were given more flexibility in how local needs would be addressed, and were encouraged to substitute away from institutional to community-based care (Vanneman and Snowden 2015). Funding for these services changed from fluctuating annual appropriations from the legislature to a dedicated revenue stream (from a sales tax and vehicle license fees). The allotment given to the counties was based on each county's funding when the legislation was signed. Until 2001, "under-equity" payments were given to certain counties (based on population and poverty measures) to address historical differences in spending.

Studies concerning California's public mental health system after Realignment have focused on spending for adult services (Scheffler and Smith 2006; Scheffler et al. 1998, 2000, 2001) as well as the characteristics of adults served (Snowden et al. 2002; Zhang et al. 2000). Given the importance of early prevention and intervention in mental health, the present study concentrated on community-based services for the child/youth population. Additionally, it is important to analyze child/youth populations separately from adult populations as there is special funding made available for children and youth enrolled in Medicaid. The Early and Periodic, Diagnosis, and Treatment (EPSDT) service has been a part of the Medicaid program since its inception, providing coverage for comprehensive health, mental health, dental, hearing and vision services for children and youth under 21 years old.

In addition to focusing on the child/youth population, this study was purposefully limited to a time period where the focus was on financing for the foundation of the public mental health system (community-based care), versus the more nuanced, specific programs brought about by the next major mental health policy change in California—the Mental Health

Services Act (MHSA) of 2004 (Initiative Measure 2004). Furthermore, its findings serve as a benchmark for policy changes at the federal level related to the Affordable Care Act's (ACA) recent Medicaid expansion in 2014 (Patient Protection and Affordable Care Act 2010).

Finally, this research addressed financial disparities between counties as this topic had only been briefly mentioned in studies of decentralized public mental health systems. In the case of California, Scheffler et al. (2000) expressed concern that, after Realignment, some local mental health authorities decreased spending per capita for adult patients, which could have signified service reduction and worse health outcomes for clients in those localities. Outside of California, Frank and Gaynor (1994) found local spending differences in decentralized mental health systems in Ohio and Texas, but did not differentiate between spending on the adult and child/youth populations. The goal of this study was to examine previously unexplored county differences in spending for fundamental, community-based care for children and youth, thereby addressing these gaps.

In this study, we examined if historical spending differences between counties would be addressed by public mental health systems. We expected that counties with high initial expenditures per user would continue to spend more on community-based specialty mental health care than counties with low initial expenditures per user. Factors likely to contribute to this trend include the wealth of a county along with a county's spending preference on public mental health. Because Realignment funding, which can be used as a match for funding Medicaid services, was based on counties' historical spending levels with minimal payments to address past county-level differences, we did not expect relatively low spenders to become high spenders or vice versa. By design, there is a strong relationship between spending on specialty mental health services through Medi-Cal (California's Medicaid program) and Realignment funding. In California, while physical health services are provided through Medi-Cal managed care plans, county-operated Mental Health Plans (MHPs) are responsible for delivering Medi-Cal specialty mental health services (California HealthCare Foundation 2013). MHPs can use Realignment funds to pay for specialty mental health services upfront. The State later uses these payments to draw down federal matching for Medi-Cal, and then reimburses MHPs. Thus, the amount of Realignment and other local funding that a county has access to affects its spending on Medi-Cal specialty mental health services.

We also expected that counties with more racially/ethnically diverse populations would spend less per capita on community-based specialty mental health care than counties with less diverse populations. This was likely for two major reasons—namely that many racial/ethnic minority children/youth use fewer community-based services than White children/youth (US Department of Health and Human Services 2001), and because of the historical association between economic disadvantages and racial/ethnic minority communities.

Given particularly tight financial constraints, one would expect that under-resourced counties would be less able to achieve the same service levels as better-resourced counties. In general, county public mental health programs have not been able to generate enough revenues to keep up with an increasing number of clients, an expanding number of services

used, and rising expenditures for those services. These increases have been particularly dramatic for California's Medicaid population and specifically for the child and youth versus adult population. Some counties even fear that they will have to cut the number of clients served or the level of service provided (Department of Mental Health 2003).

Providing enough system-level resources can play a unique role in reducing disparities, including dedicating the financial support that is often necessary for disparity reduction efforts. Community outreach and specialized, culturally and linguistically sensitive programming—which can attract minority clients and keep them in treatment—must be underwritten by financial commitments. For example, outreach and provision of translation services have been shown to increase treatment access levels (Snowden et al. 2011).

However, facing financial constraints, mental health administrators might assign the special efforts necessary to attract and retain minority clients a lower priority than what they consider more pressing responsibilities, such as treatment of disruptive and threatening adults. Lack of support for specialized programming may have a cumulative effect, as lack of early budget commitment makes new budget commitments harder to come by because of competition with increasingly entrenched interests. In short, these financing systems may lock in differences in spending trajectories.

Hampered by financial constraints over time and due to difficulties in attracting racial/ethnic minority children and youth to community-based services, we hypothesized that counties with historically lower expenditures per user and more racially/ethnically diverse populations would experience the slowest growth in expenditures for community-based care as compared to other counties, after controlling for county mental health system and county sociodemographic characteristics. With sustained resource constraints, we expected it to become increasingly difficult for these counties to address racial/ethnic utilization differences.

Methods

Sample and Variables

The study population consisted of all full-scope Medi-Cal (California's Medicaid program) enrollees 25 years and younger who received any specialty mental health care from fiscal year (FY) 1993–1994 through FY2003-04, on average approximately 156,000 children/ youth per year. We focused on the Medi-Cal population because Medicaid is the payer for the majority of consumers using public mental health services (The Kaiser Family Foundation 2011) and because California's county data on the uninsured is considered unreliable (Department of Health Care Services 2014). Additionally, we studied children/ youth—a population that has been fairly generously covered through the Medicaid program. For example, Medi-Cal covers approximately 90 % of children with serious emotional disturbance in California (California HealthCare Foundation 2013).

Variables used in this analysis came from the Medi-Cal paid claims database from the California Department of Mental Health. Each child/youth had a dedicated unique identification number across the years. Each record listed the individual's age, race/ethnicity,

diagnosis, date of service, foster care status and disability status, type of mental health service used, and the cost of each service. These claims data were merged with the Medi-Cal provider database, also from the California Department of Mental Health. They were then collapsed to the county-year level (57 county-based public mental health systems × 11 years of data; n = 627) for analysis purposes. County was determined by each patient's county of residence.

The main outcome variable was the annual Medi-Cal specialty mental health expenditures for community-based care per user for each county. A community-based service included every item that was billed for intensive and rehabilitation day treatment services, case management and brokerage services, outpatient mental health services, collateral services, therapeutic behavioral services, medication visits, and crisis intervention services in outpatient settings. As a comparison, institutional services included inpatient services at local acute general or psychiatric hospitals, psychiatric health facility services, residential care services, crisis stabilization services in emergency rooms or urgent care settings, and inpatient professional services (categorized as mental health services, medication support, and crisis intervention). These claims data completely represent specialty mental health services rendered through Medi-Cal because county-operated MHPs pay providers directly for care, in a fee-for-service (vs capitated) manner (California HealthCare Foundation 2013).

To assess our hypothesis, we grouped counties by initial spending levels and racial/ethnic diversity. Because "the original allocations to each jurisdiction [from the state] were based on their level of funding in these program areas just prior to realignment" (Legislative Analyst's Office 2001), we categorized counties as "baseline_high" if a county spent above the mean Medi-Cal expenditures per specialty mental health user in our first year of data (FY1993-94) and as "baseline_low" if a county spent below the mean Medi-Cal expenditures per specialty mental health user in FY1993-94. We further categorized counties as "less_diverse" if a county had less than 50 % racial/ethnic minorities in its population during our study period or "more_diverse" if a county had at least 50 % racial/ethnic minorities in its population during our study period. We decided upon the 50 % diversity cut point by examining the portion of racial/ethnic minorities in counties during our study period (see sensitivity analysis in the "Appendix" section). We then placed counties into four mutually exclusive groups: baseline high and more diverse, baseline high and less diverse, baseline low and more diverse (our reference group), and baseline low and less diverse. We examined trends in community-based expenditures for these four groups over "time", a variable that started with a value of one in FY1993-94 and increased by one each year thereafter, ending with a value of 11 in FY2003-04.

We ran regressions to test our hypothesis that more diverse counties with low baseline spending would have the slowest growth in expenditures for community-based specialty mental health services per capita when compared to the other county groups, after controlling for additional factors that could influence their spending. The following interaction variables were included because they were anticipated to have an effect on the slope of spending with respect to time: baseline_low&less_diverse*time, baseline_high&more_diverse*time, and baseline_high&less_-diverse*time. Along with these key independent variables of interest, we included time-varying controls for county

mental health system characteristics and county sociodemographic characteristics (Table 1). County mental health system characteristics included need and/or demand factors (the fraction of the population by age group as well as foster care, disability, and seriously emotionally disturbed or seriously mentally ill status) as well as access factors (number of mental health facilities per user and the caseload to population ratio) (Clausen et al. 1998; Garland et al. 2003; Hurlbut et al. 2004; Repetti et al. 2002). County sociodemographic characteristics included financial factors (per capita income and fraction unemployed) and population factors (total population, rural versus urban, and a binary political variable for whether or not the Republican State Assembly candidate received the majority of votes cast in the county) (Grogan 1994; Snowden et al. 2007; Snowden et al. 2008).

The research protocol for this study was approved by the Committee for the Protection of Human Subjects for the University of California, Berkeley and for the State of California.

Analysis

All statistical analysis was conducted using Stata 13. Estimates were made using ordinary least squares (OLS) as well as linear models with either fixed-effects (FE) dummy variables for each county or county random effects (RE). The use of dummy variables for counties accounts for any unobserved time-invariant variables by estimating a separate intercept for each county. FE allows cluster-specific intercepts to be correlated with covariates in the model, whereas RE is a more efficient estimator but assumes that county-level omitted variables are uncorrelated with the explanatory variables. Additionally, these models were estimated excluding and including control variables in order to examine how robust the key independent variables were to other factors changing over time in the counties.

A series of Breusch–Pagan, Hausman, and related specification tests were conducted in order to inform appropriate model choice. The null hypothesis was rejected for all Breusch–Pagan tests, indicating that there was county-level clustering. OLS was thus inefficient and had biased standard errors. The null hypothesis could not be rejected for the Hausman tests performed for the FE and RE model pairs. This indicated that both FE and RE were consistent. Although RE was more efficient in this case (Wooldridge 2009), FE results are presented here for the following reasons. First, FE removed the effect of time-invariant characteristics within each county from the independent variables; this way, the net effect of the independent variables could be assessed. Second, the point estimates and standard errors were very similar for both RE and FE. In other words, the efficiency gained with RE was not remarkable and presenting FE results is justified. Because the county groups (based on baseline spending and diversity) are time-invariant, their main effects (along with those of other time-invariant factors) are captured by the fixed effect, and thus do not appear in the FE regression tables.

The FE regression models presented here include expenditures (for absolute change) or the log of expenditures (for percent change) for community-based specialty mental health care as a function of all the independent variables listed in Table 1 as well as a time-invariant county-level error term and a time-varying county-level error term. Because there were two natural cut points for the portion of racial/ethnic minorities in counties (35 and 50 %, see

"Appendix" section), we conducted a sensitivity analysis by including each value in the models.

Before running our regression model, we graphed our outcome variable over time by county groups, and noted that there were only slight fluctuations above and below where the regression line would fall. Thus, a linear model seemed suitable. In order to test this assumption, we conducted a post-estimation analysis. We graphed the residuals versus the fitted values, and there was no pattern to the residuals as a function of the fitted value. Thus, we concluded that a linear model was appropriate.

Results

There is a wide range in the amount that California counties spent on community-based mental health services per child/youth. On average across all study years, counties spent approximately $3499 (in 2013 dollars) per child/youth Medicaid specialty mental health user, with considerable variation (standard deviation of $2117). Notably, and consistent with the deinstitutionalization movement, the vast majority of care for children and youth is provided in the community (Fig. 1). Thus, it is most meaningful to examine county differences in expenditures for community-based care.

To gain a preliminary understanding of the variation in expenditures for community-based care, we first examined county spending over time by baseline spending and diversity level without adjusting for covariates (Fig. 2). As expected, while expenditures for community-based care increased over time, counties with relatively low initial spending per user continued to spend less than those counties with historically higher spending levels. These unadjusted spending differences are illustrated in Fig. 2 by the gap between the top two lines (baseline high counties) and the bottom two lines (baseline low counties). Unlike baseline spending, the racial/ethnic diversity of the counties by itself did not have a strong connection to spending level; this is evidenced by the overlapping of the top two lines as well as the overlapping of the bottom two lines in Fig. 2.

Our hypothesis about county spending differences was upheld by our regression analyses; per capita growth in spending on community-based care was slowest for more diverse counties with low baseline spending when compared with other county groups. Descriptive statistics for the variables included in these models appear in Table 1. Regression results appear in Table 2. For all regressions reported, the inclusion of control variables did not have a large effect on the point estimates for the key independent variables of interest, indicating that the key independent variables are robust to changes in the counties over time. Holding all else constant, for more diverse counties with high baseline spending and for less diverse counties with low baseline spending, each additional year was associated with approximately $393 more spending per user (Table 2).[1] The additional annual spending for these two county groups is not statistically different from one another, as illustrated by the overlapping 95 % confidence intervals (CI) in Fig. 3. Yet, their community-based

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[1]This was calculated by adding the relevant coefficients from the regression for each county group, and taking their average. For baseline high, diverse counties: time (190.16) + baseline_high&more_diverse*time (199.27) = 389.43. For baseline low, less diverse counties: time (190.16) + baseline_low&less_diverse*time (205.52) = 395.68. The mean of 389.43 and 395.68 is approximately 393.

expenditures per user at the beginning of the study were quite different. In FY1993-94, counties where diversity and spending were high spent approximately $3485 per user per year, whereas counties where diversity and spending were low dedicated $1326 per user per year for community-based care (Fig. 2).

After controlling for all other variables in the model, for less diverse counties with high baseline spending and for more diverse counties with low baseline spending, each additional year was associated with approximately $199 more spending per user (Table 2).[2] The additional annual spending for these two county groups was not statistically significantly different from one another, as illustrated by the overlapping 95 % CI in Fig. 3. Yet, there were large spending differences for community-based care per user at the beginning of the study. Less diverse counties with high baseline spending dedicated $3606 per user per year, while more diverse counties with low baseline spending dedicated $1890 per user per year (Fig. 2).

As an additional assessment of differences between these county groups over time, we also examined the percentage change in spending by running a regression on the log of expenditures for community-based services (Table 3). Less diverse counties with low baseline spending had the fastest annual growth in expenditures at approximately 14 % (Fig. 4). This is statistically significantly different from the other county groups; the 95 % CI for baseline low, low diversity counties does not overlap with the 95 % CI for the three other county groups. The growth in expenditures for the other low baseline counties (with more diversity) did not exhibit the same trend as those with low diversity. Their annual growth in expenditures was approximately 6 %, and was not statistically significantly different from the annual percentage change in spending for counties with high baseline spending (Fig. 4).

In summary, counties with historically lower spending per user on community-based care and more diversity had a distinctly different spending trajectory than the rest of the counties; they began with a low level of spending, added the smallest absolute amount to total spending per user per year, and did not begin to close the gap in spending with counties that had high historical spending levels.

Discussion

We sought to understand if differences in county per capita spending for child/youth community-based mental health care in a decentralized system would change over time or if they would persist. While all counties increased their spending over time, a gap remained between those with historically higher spending and those with historically lower spending. Several policies likely contributed to the statewide growth in Medicaid spending for children and youth. First, in 1995, there was an expansion of services covered in Medi-Cal's EPSDT program. As a result of the T.L. v. Belshe settlement in 1995, EPSDT continued to cover medically necessary mental health care and additionally included coverage for services to correct or improve a mental health condition of full-scope Medi-Cal enrollees under 21

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[2]This was calculated by adding the relevant coefficients from the regression for each county group, and taking their average. For baseline high, less diverse counties: time (190.16) + baseline_high&less_diverse*time (17.65) = 207.81. For baseline low, diverse counties: time (190.16) = 190.16. The mean of 190.16 and 207.81 is approximately 199.

years old. Second, the Emily Q. v. Belshe lawsuit was settled in 2001, creating a new class of Medicaid community-based services called therapeutic behavioral services (TBS). TBS are supposed to help prevent children and youth from being institutionalized or help transition them out of institutional care. Yet, because these policies did not address counties' relative ability to increase their funding for their public mental health system, differences persisted. These differences in spending were most noticeable in counties with larger racial/ethnic minority populations that also had low baseline spending levels per user.

Some general factors could be linked to these spending differences. Overall, without further interventions to address the availability of financial resources for and/or the prioritization of spending on mental health, counties with low baseline or high baseline spending per capita are unlikely to change their spending behavior relative to one another. Additionally, without specific policy interventions to address utilization differences for community-based care between racial/ethnic minority and White children and youth, counties with more or less racially/ethnically diverse populations are also unlikely to change their spending behavior relative to one another.

The spending differences found in this research might be further explained by the financial system set up by Realignment, which helped sustain funding for a public mental health system in need, but also hampered changes (Vanneman and Snowden 2015). First, baseline spending was institutionalized because the adequacy of funding in the three service sectors (health, social, and mental health) were not taken into account under realignment, and realignment funding was based on the funding that counties were receiving when the legislation was signed. Thus, it is not surprising that spending patterns persisted. Second, due to a variety of other service needs, it has been hard for counties to prioritize public mental health spending and, thus, change their spending trajectories. Distributions for mental health have decreased, largely because of increased spending on child welfare/foster care and In-Home Supportive Services (IHHS). Furthermore, through Realignment, counties are allowed to transfer up to 10 % of funds from their social service, health, or mental health subaccount to another subaccount. Overall, transfers out of the mental health account have exceeded transfers into the mental health subaccount (Department of Mental Health 2003). Third, although distributions were made for equity reasons, they did not have a marked effect on reducing differences in county public mental health funding. The under-equity payments were small as they were predicated on growth in revenues (vehicle license fees and sales tax) during tough economic times (Vanneman and Snowden 2015) and the equity subaccount became dormant in 2001 (Legislative Analyst's Office 2001).

It is important to consider the following limitations in this study. First, this study is intended to be a step toward understanding spending differences in an already decentralized public mental health system. Future qualitative and quantitative research could be conducted to better understand the respective contribution of resources (i.e., county finances) and preferences (i.e., residents' spending priorities) to these spending differences. For example, resources and preferences could help explain the decreasing or flattening out of spending seen in Fig. 2 after FY2002, when counties became responsible for 10 % of EPSDT costs above a specified level, which they pay for with Realignment funds. A second limitation of this study is that we had access to data on all Medi-Cal beneficiaries 25 years old and

younger receiving specialty mental health services, but we did not have data on the total number of Medi-Cal enrollees 25 years old and younger. Thus, we could not include a control for the mental health service penetration rate (the ratio of the number of beneficiaries using specialty mental health services to the total number of enrollees) at the county-level. A high penetration rate could be related to expenditures (e.g., signifying a county's focus on this population). However, we mitigated this concern by including controls related to access that are likely correlated with penetration rate (i.e., number of mental health facilities per user and the caseload to population ratio).

Finally, the findings from this research along with its limitations can motivate future studies related to county fiscal behaviors. As discussed, the present study examined expenditures for community-based, "usual care" for hundreds of thousands of children and youth in California's county-based public mental health system. The next major state policy that impacted this population was the Mental Health Services Act (MHSA) of 2004. Existing reports on MHSA highlight programming meant to impact the lives of a subset of children and youth utilizing the public mental health system (UCLA Center for Healthier Children, Youth, and Families 2013a, b). For example, statewide, 80 % of the MHSA funding received by counties is for community services and supports (CSS), which included outreach and engagement to approximately 17,000 children, youth, and families (CYF) and 10,000 transition-age youth (TAY) as well as full service partnerships (FSPs) for approximately 6000 CYF and 7000 TAY in FY2009-10. Notably, these numbers may not represent mutually exclusive children and youth, and also represent a small fraction of the total child and youth population served by the public mental health system. While the focus of MHSA is quite different than the core services studied here, the findings from the current research may be applicable to county-level MHSA studies. It is possible that particular counties have been more aggressive in seeking MHSA funding and implementing MHSA services than others; the historical spending and racial/ethnic framework used in the current study might be useful in studying variability in MHSA activity by county.

Conclusion

Our findings suggest that without policy inputs that address county-level differences, it is unlikely that existing disparities will be addressed by localities. Thus, future efforts that place more attention on system-level differences are important. Because the State maintains some oversight authority for county-based public mental health systems, it could play an important role in this process. We do not yet know if these financial differences are associated with the public mental health system's ultimate concern—the effectiveness of care provided. It is feasible that children and youth in counties that are spending more on mental health care are receiving either higher or lower quality care than children and youth in counties spending less. We also do not know if this care is equally effective for all groups —e.g., racial/ethnic minority populations. It is not currently feasible to assess mental health outcomes across counties because there is great variability in what measures counties track and how they are reporting these measures. The California Department of Health Care Services is working to standardize and centrally collect performance outcomes from all counties for children and youth using Medi-Cal specialty mental health services, and

anticipates that such data will be available in the summer of 2016 (Department of Health Care Services 2014).

The results from the present study have important policy implications. They raise the question of whether or not we should attend to financial or other differences in our public mental health system and other decentralized systems. This is a particularly salient issue as additional services have been or could be devolved to more local levels. For example, on the state-local level, California's FY2011-12 state budget explicitly built off the 1991 realignment model by transferring more responsibility for public safety, including additional mental health services, to the counties (Brown 2011; California Healthline 2011). Decentralization issues are also active on the national-state level. After a 2012 Supreme Court decision, the Affordable Care Act's Medicaid expansion became optional for states. Those states that expand Medicaid to adults at a higher income level anticipate subsequently enrolling more children and youth who are eligible but uninsured through the program. The optional nature of the Medicaid expansion combined with already varying rates of children's Medicaid participation rates by state (from 55 % in Nevada to 95 % in the District of Colombia and Massachusetts; Health Affairs 2011) means that there will be differential spending on Medicaid and differential access to coverage by geographic location. This has meaningful consequences for Medicaid-eligible children and youth, particularly for those most in need of care, such as those with serious emotional disturbance or serious mental illness. In California, which is an expansion state, counties may have differing capacity to care for newly enrolled children and youth in their public mental health systems. We may see differences by the county groups examined in the current study.

The persistent spending differences identified in the present study shed light onto a potentially key disparity between counties in a decentralized state system. Resource differences at local levels could be compounded as other services are devolved. Lessons learned apply to further devolution planned at the national, state, and local levels.

Acknowledgments

Appendix: Sensitivity Analysis

To test whether the model was sensitive to the definition of a diverse population in counties, a different cut point for the variable "diverse" was chosen. Figure 5 below shows a histogram of the fraction of the population that is a racial/ ethnic minority in each county, averaged over the 11 years of this study. A roughly bimodal distribution was observed. A 50 % cut point for "more diverse" was used in the main analysis of this study because that indicates that the majority of the population was a racial/ethnic minority. For the other cut

point, those with a fraction of racial/ethnic minority population above 35 % were in the "more diverse" group, and those below 35 % racial/ethnic minority population were considered "less diverse." At this cut point, there were: 19 low baseline spending counties that were less diverse, 15 low baseline spending counties that were more diverse, 9 high baseline spending counties that were less diverse, and 14 high baseline spending counties that were more diverse. A cut point higher than 50 % could not be analyzed because it resulted in very small samples for the more diverse groups of counties.

The patterns experienced by these new groups of counties (with the lower diversity cut point) (Fig. 6) are somewhat similar to the patterns experienced by those at the higher diversity cut point (Fig. 2). There is considerable overlap in both cases between the spending levels for baseline high counties whether or not they have more or less diversity. There is also considerable overlap in both cases between the spending levels for baseline low counties whether or not they have more or less diversity.

Differences between the two diversity cut points are illuminated by the regression analyses. As we expected, the trends experienced by the four county groups over time were more similar with the lower diversity cut point (Table 4) than with the higher diversity cut point (Table 2). At the 35 % cut point level, holding all else constant (Table 4), each additional year was associated with approximately

- $256 more spending per user in more diverse counties with high baseline spending.

- $363 more spending per user in less diverse counties with low baseline spending.

- $284 more spending per user in more diverse counties with low baseline spending.

- $206 more spending per user in less diverse counties with high baseline spending.

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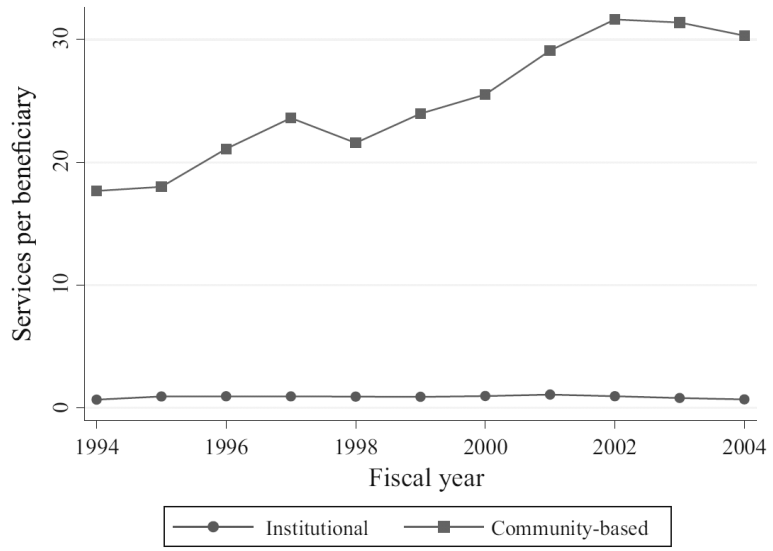
Fig. 1.
Number of institutional and community-based services per beneficiary, all counties, 0–25 year olds, FY1993-94 to FY2003-04

Fig. 2.
Community-based expenditures per Medi-Cal specialty mental health user (in 2013 dollars), counties in spending and diversity groups, 0–25 year olds, FY1993-94 to FY2003-04

Fig. 3.
Annual change in community-based expenditures per Medi-Cal specialty mental health user (in 2013 dollars), counties in spending and diversity groups, 0–25 year olds, FY1993-94 to FY2003-04

Fig. 4.
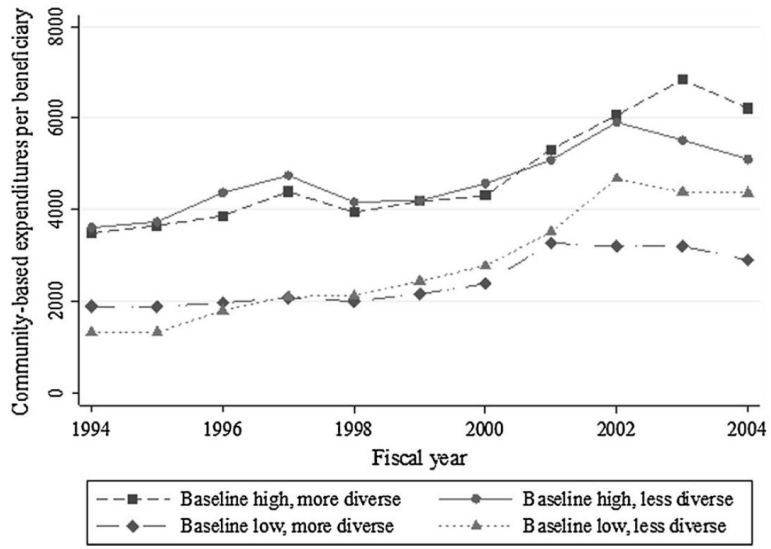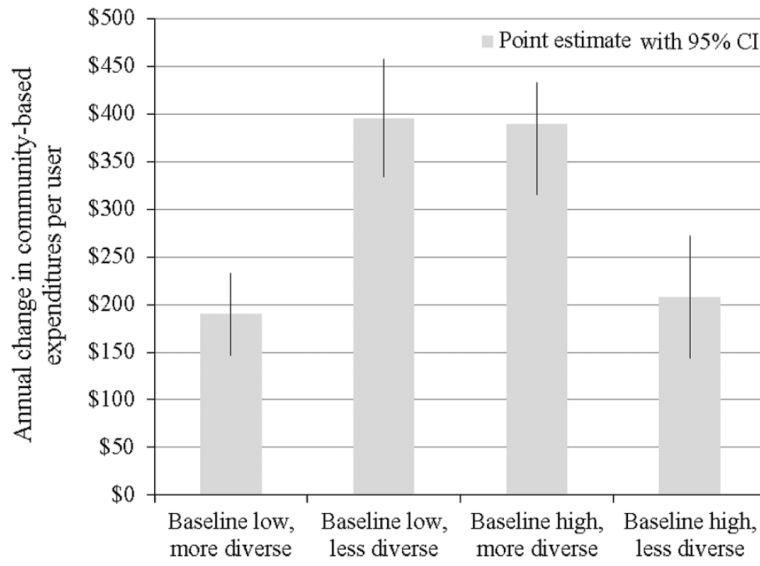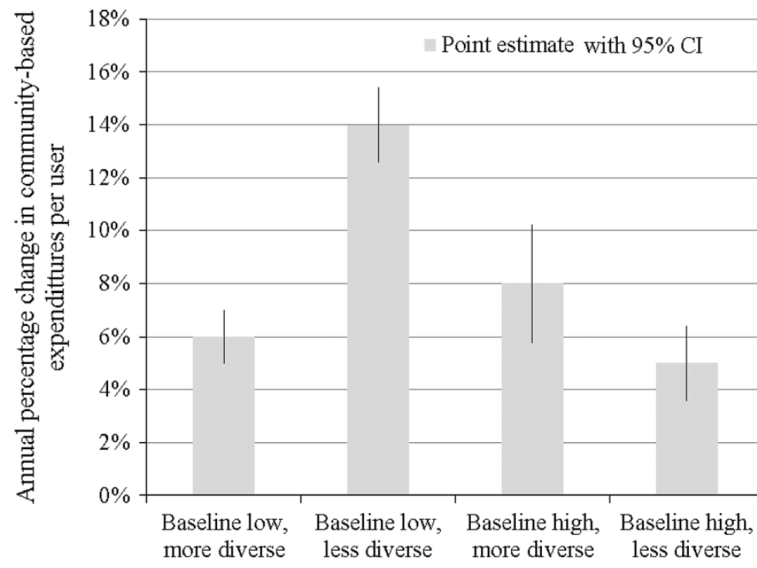Annual percentage change in community-based expenditures per Medi-Cal specialty mental health user (in 2013 dollars), counties in spending and diversity groups, 0–25 year olds, FY1993-94 to FY2003-04
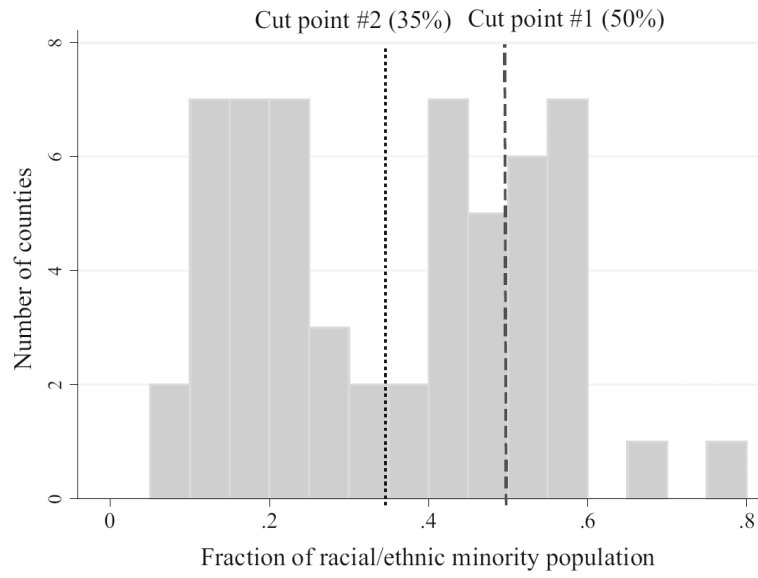
Fig. 5.
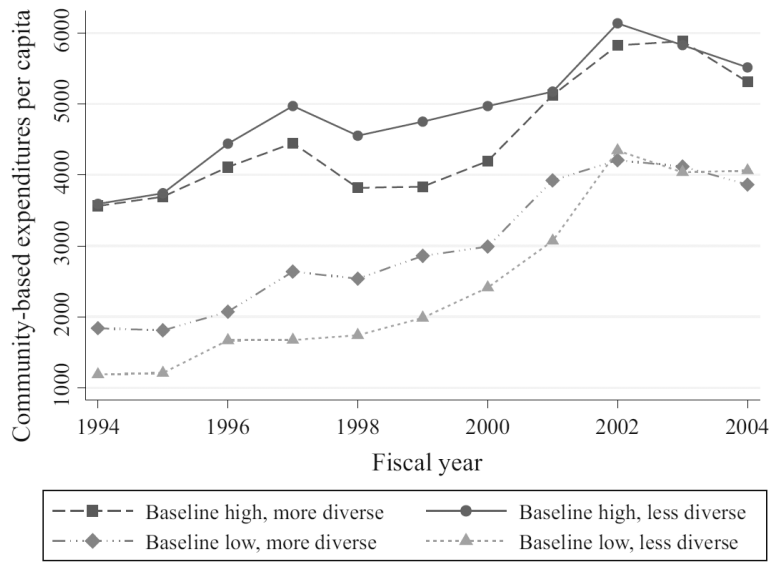Histogram of fraction of racial/ethnic minority population, all counties

Fig. 6.
Community-based expenditures per user (in 2013 dollars), counties in groups, 0–25 year olds, FY1993-94 to FY2003-04

Table 1

Description of and summary statistics for analysis of expenditures for community-based Medi-Cal specialty mental health care

Key variables of interest			
Time	**Year when services were received. Started with a value of 1 in FY1993-94 and ended with a value of 11 in FY2003-04**		
	Description[a]	**N**	**%**
Expenditures and diversity (time invariant)			
Baseline low, less diverse	County system both baseline low and less diverse	25 counties × 11 years = 275	44
Baseline low, more diverse	County system both baseline low and more diverse	9 counties × 11 years = 99	16
Baseline high, less diverse	County system both baseline high and less diverse	17 counties × 11 years = 187	30
Baseline high, more diverse	County system both baseline high and more diverse	6 counties × 11 years = 66	10

	Description[a]	**Mean**	**Standard Deviation**
Controls for county mental health system characteristics (time-varying)			
Age (reference: fraction of 21–25 year olds)			
Fraction of 0–5 year olds	Fraction of the study population that was 0–5 years old	.04	.02
Fraction of 6–20 year olds	Fraction of the study population that was 6–20 years old	.84	.08
Fraction in foster care	Fraction of the study population that was in foster care—custodial care provided by the state	.19	.11
Fraction disabled	Fraction of the study population that was disabled—based on federal and state standards	.18	.08
Fraction seriously emotionally disturbed or seriously mentally ill	Fraction of the study population who are seriously emotionally disturbed or seriously mentally ill	.66	.15
Number of mental health facilities per user	Ratio of the number of facilities to users. Calculated from Medi-Cal provider file and Medi-Cal claims file	.016	.022
Caseload to population ratio	Fraction of the county population that is a child/youth user of Medi-Cal specialty mental health services. Calculated from Medi-Cal claims file and California Department of Finance's Annual Intercensal Population Estimates	.005	.003

	Description[a]	**N**	**%**
Controls for county sociodemographic characteristics (time-varying)			
Rural (vs. urban)[b]	Rural if the county population is less than 200,000—definition used by the California Legislature and Legislative Analyst's Office. Calculated from California Department of Finance's Annual Intercensal Population Estimates	337	54
Republican (vs. Democrat)[b]	Republican if the Republican State Assembly candidate received the majority of the votes cast in the county. Reported by California Secretary of State and Voting Statistics	393	63

	Description[a]	Mean	Standard Deviation
Per capita income[c]	Per capita income (in tens of thousands of 2013 dollars). Reported by California Department of Finance's Bureau of Economic Analysis	$35,315	$11,336
Fraction unemployed	Fraction that is unemployed. Reported by California Department of Finance's Statistical Abstract	.09	.04
Population[c]	Total population (in tens of thousands). Calculated from California Department of Finance's Annual Intercensal Population Estimates	587,761	1,336,823

[a]Variables calculated from Medi-Cal claims file, unless otherwise noted

[b]A binary variable, where 1 signifies presence of the characteristic and 0 signifies absence of the characteristic

[c]Rounded to nearest whole number

Table 2

Effect of time, historical expenditures, racial/ethnic diversity, county mental health system characteristics, and county sociodemographic characteristics on expenditures for community-based Medi-Cal specialty mental health care per child/youth user, fixed effects (FE) models

	Model 1[a]		Model 2[b]	
	Without controls		With controls	
	β	SE	β	SE
Key independent variables of interest				
Time	151.84 ***	36.03	190.16 ***	43.14
Baseline_low&less_diverse*time	207.52 ***	42.02	205.52 ***	43.80
Baseline_high&more_diverse*time	168.13 **	56.98	199.27 **	60.00
Baseline_high&less_diverse*time	32.75	44.56	17.65	47.15
County mental health system characteristics				
Age (reference: fraction of 21–25 year olds)				
Fraction of 0–5 year olds	–	–	4875.85	2290.25
Fraction of 6–20 year olds	–	–	1186.72	717.86
Fraction in foster care	–	–	604.30	680.35
Fraction disabled	–	–	−1069.52	749.29
Fraction seriously emotionally disturbed or seriously mentally ill	–	–	179.47	396.64
Number of mental health facilities per user	–	–	14419.92 ***	2892.62
Caseload to population ratio	–	–	−9724.22	34866.43
County socio-demographic characteristics				
Per capita income (in tens of thousands of 2013 dollars)	–	–	−499.39 *	211.97
Fraction unemployed	–	–	3686.31	3344.44
Population (in tens of thousands)	–	–	−11.19	9.92
Rural (vs. urban)	–	–	−370.03	535.61
Republican (vs. Democrat)	–	–	−102.31	218.85
Constant	3127.14 ***	432.42	4732.03 **	1713.17

[a] R^2 = .74, N = 627, df = 60. Fifty-seven county FE dummy variables were included in the analysis, but are not presented in the table above

[b] R^2 = .76, N = 627, df = 72. Fifty-seven county FE dummy variables were included in the analysis, but are not presented in the table above

*
$p < .05$;

**
$p < .01$;

***
$p < .001$

Table 3

Effect of time, historical expenditures, racial/ethnic diversity, county mental health system characteristics, and county socio-demographic characteristics on the natural log of expenditures for community-based Medi-Cal specialty mental health care per child/youth user, fixed effects (FE) models

	Model 1[a] Without controls		Model 2[b] With controls	
	β	SE	β	SE
Key independent variables of interest				
Time	.06***	.01	.06***	.01
Baseline_low&less_diverse*time	.07***	.01	.08***	.01
Baseline_high&more_diverse*time	.003	.02	.02	.02
Baseline_high&less_diverse*time	−.02	.012	−.01	.01
County mental health system characteristics				
Age (reference: fraction of 21–25 year olds)				
Fraction of 0–5 year olds	–	–	−.10	.88
Fraction of 6–20 year olds	–	–	−.88	.37
Fraction in foster care	–	–	.82***	.19
Fraction disabled	–	–	−.09	.23
Fraction seriously emotionally disturbed or seriously mentally ill	–	–	−.12	.11
Number of mental health facilities per user	–	–	2.20**	.80
Caseload to population ratio	–	–	3.87	9.83
County socio-demographic characteristics				
Per capita income (in tens of thousands of 2013 dollars)	–	–	−.20**	.06
Fraction unemployed	–	–	−.31	.93
Population (in tens of thousands)	–	–	−.004	.003
Rural (vs. urban)	–	–	−.10	.15
Republican (vs. Democrat)	–	–	.02	.06
Constant	8.11***	.12	10.20***	.56

[a] R^2 = .74, N = 627, df = 60. Fifty-seven county FE dummy variables were included in the analysis, but are not presented in the table above

[b] R^2 = .76, N = 627, df = 72. Fifty-seven county FE dummy variables were included in the analysis, but are not presented in the table above

*
$p<.05$;

**
$p<.01$;

***
$p<.001$

Table 4

Effect of time, historical expenditures, racial/ethnic diversity (35 % cut point), county mental health system characteristics, and county socio-demographic characteristics on expenditures for community-based Medi-Cal specialty mental health care per child/youth user, fixed effects (FE) models

	Model 1[a]		Model 2[b]	
	Without controls		With controls	
	β	SE	β	SE
Key independent variables of interest				
Time	261.74[***]	28.57	283.86[**]	43.13
Baseline_low&less_diverse*time	76.38[*]	38.22	79.10	40.78
Baseline_high&more_diverse*time	−40.01	41.13	−28.11	43.28
Baseline_high&less_diverse*time	−44.67	46.66	−77.80	49.94
Mental health system characteristics				
Age (reference: fraction of 21–25 year olds)				
Fraction of 0–5 year olds	–	–	3674.01	3089.82
Fraction of 6–20 year olds	–	–	1255.92	739.06
Fraction in foster care	–	–	418.71	699.84
Fraction disabled	–	–	−1424.24	771.22
Fraction seriously emotionally disturbed or seriously mentally ill	–	–	201.99	407.43
Number of mental health facilities per user	–	–	14688.43	2970.91
Caseload to population ratio	–	–	20328.57	35363.61
County socio-demographic characteristics				
Per capita income (in tens of thousands of 2013 dollars)	–	–	−310.86	216.80
Fraction unemployed	–	–	4458.40	3422.96
Population (in tens of thousands)	–	–	−6.90	10.87
Rural (vs. urban)	–	–	−17.60	547.49
Republican (vs. Democrat)	–	–	−205.25	225.75
Constant	3716.58[***]	392.39	4260.29	1801.02

[a]R^2 = .73, N = 627, df = 60. Fifty-seven county FE dummy variables were included in the analysis, but are not presented in the table above

[b]R^2 = .75, N = 627, df = 72. Fifty-seven county FE dummy variables were included in the analysis, but are not presented in the table above

[*] $p<.05$;

[**] $p<.01$;

[***] $p<.001$