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Effect of Racial and Ethnic Composition of Neighborhoods in San Francisco on Rates of Mental-Health Related 911 Calls

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Abstract

Objective—This study investigated the association between San Francisco neighborhoods' racial/ethnic residential composition and the rate of mental-health-related 911 calls.

Methods—Calls to the San Francisco 911 system from January 2001 through June 2003 (n=1,341,608) were divided into mental-health-related and other calls. Police sector data in the call records were overlaid onto U.S. Census tracts to estimate sector demographic and socioeconomic characteristics. Negative binomial regression was used to estimate the association between black, Asian, Latino and white resident percentage and rates of mental-health-related calls.

Results—Percent of black residents was associated with a lower rate of mental-health-related calls (IRR=.99, 95% CI .98–1.00). Percent of Asian and Latino residents had no significant effect.

Conclusions—The observed relationship between black residents and mental-health-related calls is not consistent with known emergency mental health service utilization patterns. The paradox between underutilization of the 911 system and overutilization of psychiatric emergency services deserves further investigation.

The 911-call system plays an important and frequently overlooked role in the provision of access to public mental health services. It can protect the community from violence by individuals in psychiatric crisis who are engaging in dangerous or threatening behavior (1). It is also a means through which individuals who are at risk of harming themselves can contact the public safety system, and through which others can alert the system of danger and thus prevent suicide or other self-injurious behavior. Through 911 calls, persons with severe mental illness in crisis receive acute psychiatric services that can subsequently connect them to other mental health care.

Well-established, persistent and troubling racial/ethnic disparities exist in mental health services delivery and access in the United States (2). These disparities are seen in the psychiatric emergency system: black patients are disproportionately represented in psychiatric emergency rooms (3); Asian patients are underrepresented in outpatient mental health services and tend to access the mental health care system later and at more severe levels of illness than do whites (4); Spanish-speaking Latinos with severe mental illness are less likely than English-speaking Latino and white patients to use psychiatric emergency services (5). The psychiatric emergency

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response systems of cities are potentially important settings in which to explore racial/ethnic differences in mental health service use.

Although the 911 system handles many types of emergencies, it is linked closely with law enforcement. Law enforcement officers' role in the disposition of calls makes them *de facto* gatekeepers to safety net mental health services (6). Distrust of law enforcement is common in communities of color (7). Police and ambulances have been found to bring black patients with psychoses to psychiatric emergency service more frequently than other patients (8). Distrust and fear of law enforcement may lead some communities of color not to trust that mental-health-related calls will be handled appropriately and therefore be reluctant to use the 911 system when they or people they know experience a mental health crisis. Furthermore, the perceptions of persons with mental illness within racial/ethnic minority communities may also affect the community's response to those exhibiting symptoms of illness. Stigma concerns and the fear of hospitalization have both been identified as obstacles to mental health treatment in black, Asian and Hispanic communities (9). Although prior work has examined racial disparities in emergency service utilization and the social context of help-seeking behaviors (10), differences between racial/ethnic groups in the perception of law enforcement and use of 911 services have not, to our knowledge, been previously explored.

We would expect both distrust of law enforcement and stigma about obtaining mental health services to lead to a reduced tendency of racial/ethnic minorities to seek help in psychiatric crises through the 911 system. Calls to the 911 system regarding mental-health-related crises generally originate in the physical location where the crises occur, so attitudes in those places towards public health and safety authorities, as well as towards mental illness, could affect the rate of mental-health-related 911 calls. From this it follows that neighborhoods with higher proportions of residents from racial/ethnic minority groups would be expected to have a lower frequency of calls related to mental-health-related crises than neighborhoods with fewer minority residents. Fewer 911 calls would then keep persons with severe mental illness in minority communities at risk of harming themselves or others and delay needed mental health treatment during psychiatric crises.

This paper investigates the hypothesis that the rate of mental-health-related 911 calls is negatively associated with the percentage of racial/ethnic minority residents, after controlling for other sources of differences in propensity to call 911, such as crime (11), neighborhood socioeconomic status, and demographic composition. We tested this hypothesis using existing 911-call data and Census 2000 data from San Francisco, a racially heterogeneous city with a population in 2005 of approximately 739,000, of which about 33.0% are Asian/Pacific Islander, 7.3% are black, and 14% are Latino (12).

METHODS

Prior to the initiation of research, approval for the study was obtained from the institutional review board at the University of California-San Francisco.

We analyzed pre-existing data on all 911 calls occurring in San Francisco County from January 2001 through June 2003. The 911 dispatcher assigned a code to each call based on the callers' description of the nature of the emergency. Calls were included if they were made by individuals from the community; calls from automated systems such as burglar alarms and calls from police officers to the dispatch center were excluded. We identified three codes that indicated a mental health-related call: 800 ("mentally disordered person"), 801 ("person attempting suicide"), and 5150 ("mental health detention"). The 5150 code is generally used for calls from treatment providers; the 800 and 801 codes are used for calls made by either providers or citizens. Other community-initiated call codes (i.e. for crimes and other

complaints) were classified as not mental health-related. The 911 dataset yielded a sample of approximately 1.34 million calls in the study's 30-month period, including 28,197 mental-health-related calls.

San Francisco is divided into 50 police sectors that are roughly the area of several city blocks, and the sector from which a 911 call originates is routinely recorded. These sectors were large enough to ensure that a sufficient number of 911 calls could be analyzed from each sector. Sector boundaries were not necessarily coterminous with spatial units used by the U.S. Census, so geographic information systems software (ArcGIS9) was used to overlay San Francisco's approximately 175 Census tracts onto the SFPD sectors. Sectors were then characterized in terms of median household income, percent of population by racial/ethnic groups (Asian; black; Latino; white; and other, which includes Native Americans and self-identified "other" groups) and sex, percent of persons living below the poverty level, percent of households occupied by renters, and median resident age. Census-tract-level data on these variables is generally only collected during decennial census years, so data were used from the most recent Census in the year 2000.

Negative binomial regression was performed to estimate the association between the rate of mental-health-related 911 calls and the independent variables. The exponentiated regression coefficients from these models are reported as incidence rate ratios, which can be interpreted as measure of relative risk (13). To account for differences in the total number of 911 calls across sectors, the number of 911 calls per sector was included as an offset. Incidence rate ratios of the number of mental-health-related calls were first estimated using a multivariate model that included all dependent variables. Non-significant variables were removed one at a time from the model (starting with the highest p-value) until all coefficients had t-statistics of at least 2. Models were fit using the GENMOD procedure in SAS version 9.2.

RESULTS

Over the study period, the mean number of 911 calls per sector was $26,832 \pm 11,899$ and the mean number of mental-health-related calls was 564 ± 454 . Mental-health-related calls averaged 2.0% of all calls across all sectors.

Our model indicated that the proportion of black residents was negatively related to the rate of mental-health-related calls, with a one-percent increase in black residents resulting in a 1.1% decrease in the rate of calls. Over one standard deviation increase in the percentage of black residents (12.4%), the rate of mental-health related calls decreased by 13.3% (CI 7.0% – 20%). Contrary to our hypothesis, proportion of Asian and Latino residents was not significantly related to the rate of calls. The racial/ethnic category "other," which represented less than two percent of the population, was significant in the final reduced multivariate model, where a one-percentage-point increase led to a 12.7% decrease in the rate of calls. Three other neighborhood characteristics (higher percentage of male residents, higher percentage of renters, and higher median resident age) were also associated with higher rates of mental-health-related calls.

DISCUSSION AND CONCLUSIONS

The relationship between the observed proportion of black residents and mental-health-related calls is not consistent with known patterns of emergency mental health service utilization. Black adults are over-represented in psychiatric emergency services in San Francisco, relative to overall population size (12), a finding that has also been observed in other cities with high poverty rates (11). The finding that neighborhoods with more black residents generate relatively fewer mental-health-related 911 calls suggests that black patients enter the emergency mental health system through means other than the 911 system, and/or that black

patients who arrive through the 911 system come disproportionately from neighborhoods with smaller black populations. These different explanations cannot be tested with these data but are important topics for future investigations that link 911 calls and admissions to psychiatric emergency services to other potential factors on the pathway to mental health services utilization, such as beliefs about mental health treatment, the social context of psychiatric emergencies, and the role of social networks of persons with severe mental illness (10).

The data available to characterize neighborhoods are less than optimal in some respects. Although the Census Bureau updates citywide population estimates each year, information on the sociodemographic characteristics of areas comparable to the administrative boundaries of the police sectors is only available from decennial census data. Therefore, US Census 2000 data were used to estimate community characteristics. Some neighborhoods may have undergone changes between the collection of Census 2000 data and the study period (2001–2003). However, since the end of the study period (June 2003) was less than four years after the census, and most calls were in the two years immediately following the census, bias from migration following census data collection should be minimal. Another concern is that census tracts and other administrative boundaries may not represent meaningful geographic units, such as neighborhoods. However, the police sectors used in this study are functionally relevant to the systems that use them and could serve as targets for policy change.

The data examined here suggest that racial/ethnic composition is associated with the rate of mental-health related 911 calls in San Francisco neighborhoods, but only through the proportion of residents who are black or of “other” race. One important, potential implication of underutilization of the 911 system by the black community is that needed treatment may be delayed, therefore posing greater risks to the health and safety of both affected individuals and their communities. However, this initial study provides few insights into the reasons for underutilization of the 911 system in black neighborhoods. Investigation of the perceptions of black individuals regarding the 911 system and the role of police in handling psychiatric crisis would be informative, as would a better understanding of the outcomes of mental health related 911 calls (e.g., do black individuals calling 911 for a mental health crisis experience different outcomes than individuals of other ethnicities?) This research could be accomplished by establishing systematic linkages between 911 calls, police incident reports and mental health service records. In conclusion, this initial examination of mental-health-related 911 calls suggests that the 911 system should not be overlooked as a component of the service system as we strive to better understand and address ethnic differences and disparities in mental health care.

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Table 1

Binomial regression model of predictors of rates of mental-health-related calls to 911 in San Francisco police sectors

Sociodemographic characteristics	Incident Rate Ratio	p	95% CI	Incident Rate Ratio over one standard deviation of variable	95% CI
Percent black	.99	<.001	(.98–1.00)	.87	(.80–.93)
Percent other race/ethnicity	.80	<.001	(.66–.98)	.87	(.77–.99)
Percent male	1.06	.029	(1.04–1.08)	1.38	(1.23–1.54)
Percent renters	1.01	<.001	(1.00–1.01)	1.20	(1.10–1.30)
Resident age	1.05	<.001	(1.03–1.07)	1.21	(1.12–1.31)
Dispersion = .062 (.037–.087)					