Spatial Typologies of Care: Understanding the Implications of the Spatial Distribution of Off-Base Civilian Behavioral Health Providers Who Accept TRICARE Prime to Service Persons and Their Dependents

Eric Schultheis, JD; Amy Glasmeier, PhD

ABSTRACT Over the last decade, demand for services from military treatment facilities (MTFs) has frequently exceeded capacity resulting in increased usage of off-base civilian Tricare providers (OCTP). This capacity shortage has been particularly acute for mental health care. At many installations, OCTPs are the main source of mental health care for military personnel and their families. Utilizing data on the location of mental health OCTPs and demographic data, we examine the spatial accessibility of mental health OCTPs around five military installations. Variation exists in the spatial accessibility of mental health OCTPs depending on the geographic context of an installation. There is a mild correlation between the number of mental health OTCPs proximate to a base and the beneficiaries enrolled in an MTF. There is a strong correlation between the size of the general population proximate to an installation and the number of mental health OCTMPs present. Installations located in densely populated areas had high ratios of mental health OCTPs to the MTF beneficiary population but not when the civilian demand on these providers was accounted for. This study's findings open several avenues for future research and policy aimed at increasing the effectiveness of the mental health OCTP network.

INTRODUCTION

A major challenge facing the nation's military health care system is the growing demand for mental health services among active duty service persons and their families. Researchers estimate that as many as 20% of service persons returning from the Operation Enduring Freedom/Operation Iraqi Freedom (OEF/OIF) conflicts needed a referral for mental health care or were already receiving such care.[1] Hospitalization and ambulatory care rates for mental disorders at military installations have risen sharply in recent years. The prevalence of mental health issues among service persons is itself troubling. A related concern is the rise in expenditures on military mental health care services to meet the demand. In FY2012, over half the total expenditures made by the military health care system was for mental health care.[2]

In this study, we present an analysis of the spatial accessibility of mental health providers around five military installations located in various representative geographic contexts. Our investigation of the spatial accessibility of mental health providers focuses on the relationship between the density of the off-base, civilian mental health provider network (OCMHPN) and the two sources of demand on the OCMHPN—the population enrolled in the military treatment facility (MTF) and the civilian population proximate to the installation. Our effort is intended to (1) explain how and why the spatial distribution of OCMHPNs is germane, (2) describe the spatial distribution of OCMHPN around the study installations, (3) suggest a method for examining the spatial distribution of OCMHPNs, and (4) explain the policy and operational implications of our findings. We begin by defining relevant terms, move forward by describing the data used in our study, review our methodological approach, and lastly we discuss our findings.

Defining Accessibility

The term accessibility has many meanings. In this study, we adopt a definition of accessibility first advanced by Khan[3] and subsequently used by a variety of social service and health care accessibility researchers.[4–6] Khan[3] asserts that accessibility can be decomposed into four analytically distinct dimensions: spatial, social, potential, and realized. This framing of accessibility is sometimes explicit in a given research project; however, it is more commonly implicitly adopted via research design or implementation (Table I).[7–9]

In this study and in Kahn's[3] typology, "spatial" accessibility measures physical barriers to obtaining a service. Physical barriers are factors such as time, distance, and degree of effort that a person must overcome to use the service. In contrast to physical barriers, "social" accessibility measures experiential aspatial social characteristics that mediate service usage by population type or, as Patel et al[4] state, "social access ... stresses the relevance of non-geographic barriers or facilitators, essentially [addressing] personal idiosyncrasies and individual perception." Distinct from physical and

Post-Traumatic Stress Innovations Project, Sociotechnical Systems Research Center, Massachusetts Institute of Technology, 77 Massachusetts Avenue (E38-600), Cambridge, MA 02139-4307.

The content of this article does not necessarily reflect the position or the policy of the Government, and no official endorsement should be inferred. Any and all errors in this article are solely attributable to the authors of this manuscript.

doi: 10.7205/MILMED-D-14-00229

TABLE I. A Typology of Accessibility (Recreated from Patel, Balmer, and Pleasance[2])

	Spatial (Geographic)	Aspatial (Social)
Potential	Potential Spatial/ Geographic Access	Potential Aspatial/ Social Access
Realized	Realized spatial/ geographic access	Realized Aspatial/ Social Access

experiential attributes, "potential" access examines the entire universe of possible service users. In contrast, "realized" access examines individuals who overcame barriers to accessing a service and actually used the service.

Application of the Accessibility Framework to Studies of the Military Mental Health Care System

One stream of research on the military mental health care system focuses on the stigma associated with seeking mental health care.[10–12] We will demonstrate how two emblematic studies related to mental health care stigma, one by Kim et al[11] and one by Britt,[12] fit into the four-dimension accessibility typology. Kim et al[11] examine how an aspatial factor (stigma) mediates the use of mental health care services by active duty personnel. In addition, Kim et al[11] examine how stigma affects actual usage of care. To the extent that Kim et al[11] explores these two dimensions, their study falls into the social/realized dimensions. In contrast, Britt[12] broadly explores how stigma affects the accessibility of mental health services without examining actual service usage rates. Instead, Britt[12] examines how stigma affects a service person's potential usage of mental health care. Given these two characteristics of the research, Britt's[12] research examines the social/potential dimensions. Our study examines the physical barriers that affect how service persons might use mental health care and thus deals with the spatial/potential dimensions of accessibility.

The four dimensions of accessibility, when viewed together, offer a comprehensive perspective on accessibility. Each individual dimension, however, only illuminates one aspect of accessibility. For example, purely spatial accessibility studies are unable to account for how aspatial attributes such as stigma, outreach, or organizational structure mediate service usage. Similarly, studies of realized access provide insights into the population that uses a service but they cannot tell us much about who might be a service user but for access barriers. We observe that existing research tends to focus on the aspatial aspects of mental health care accessibility for service persons and their families. Ahead of formal research studies, some organizations are currently advocating for programs aimed at addressing issues of spatial access to health care of veterans, service persons, and their families.[13,14] These efforts call forth the need for policy-oriented spatial accessibility research. This study is an attempt to address this need.

METHODS

This study examines the "potential spatial accessibility" of the OCMHPN. We study the potential spatial accessibility of the OCMHPN because it provides an important baseline concerning the supply of mental health care providers and, secondarily, it opens the door for investigations into possible agglomeration and/or congestion effects in the OCMHPN. We use a case study methodology that examines the spatial distribution of civilian mental health care providers who accept TRICARE Prime around five military installations (Camp Lejeune, Camp Pendleton, Fort Drum, Fort Hood, and Schofield Barracks). Using this approach, we examine whether and how the OCMHPN varies by geographic context, for example, the rural context of Fort Drum versus the urban context of Camp Pendleton versus the semiurban context of Camp Lejeune.

Our focus on the OCMHPN reflects our belief that studies of the military mental health care system should focus not only on the care available to service persons but also to their families. A family-centric approach is justified by both the relevant literature,[15–17] the sheer number of dependents to whom the Department of Defense (DoD) must provide care, and the resources expended to meet this care obligation. Why does a family-centric examination require an examination of the OCMHPN? Dependents of service persons frequently have limited access to MTFs and must rely on the OCMHPN for mental health care.

The MTFs connected to the five study areas had a combined enrollment of approximately 259,400 individuals. Active duty soldiers and medically eligible guard or reserve members comprised roughly 41% of this population. Dependents of active duty service persons and medically eligible guard or reserve members comprised roughly 40% of this population. The remaining portion of the enrolled population consisted of retirees, dependents of retirees, inactive guard or reserve soldiers, dependents of inactive guard or reserve soldiers, dependents of survivors, and persons in a catch-all "other" category. A research effort focused solely on the care delivery system for service persons fails to account for the needs of nearly half of system beneficiaries.

In the remainder of this section, we detail key components of our study's methodology. In particular, we first describe the mental health providers types examined. We then detail how we defined the potential service user population. Third, we delineate the geographic scope of the study. Lastly, we briefly discuss several limitations of the available data.

Selection of Health Care Providers Studied

We examined a subset of the total universe of mental health provider types. We selected this subset to include mental health providers that (1) might provide services related to postdeployment mental health issues and (2) that were roughly comparable across the three regional contracted care provider networks (RCCPN) (HealthNet, Humana, and

United Healthcare). In particular, we examined six different provider categories that meet these criteria: (1) psychiatrist (MD), (2) psychologist (PhD or PsyD), (3) mental health counselor, (4) TRICARE mental health counselor, (5) social worker, and (6) marriage and family therapist. We obtained the set providers in the above categories from the TRICARE Prime provider lists published by the RCCPNs.

Researchers must know both the location of service providers and the sources of demand on those providers (i.e., the potential user population) to examine potential spatial accessibility. In the case of the OCMHPN, there are two sources of demand. One demand source comes from beneficiaries enrolled in TRICARE Prime at the MTF. This population primarily consists of (1) service persons, (2) TRICARE-eligible guard members who are stationed at the base, and (3) the dependents of service persons and TRICARE-eligible guard members. We adjusted the MTF population count by the incidence of diagnosed mental health issues among service persons returning from the OEF/OIF conflict.[1] The second source of demand for mental health providers in the OCMHPN is the civilian market. We estimate the magnitude of this second demand source with the number of persons between 15 and 64 years old who live in the vicinity of an installation (including persons who are garrisoned at the installation), adjusted for the incidence rate of mental health issues in the general population in the United States.[18,19] Based on the findings of Wang et al[18] and Kataoka et al,[19] we applied a mental health incidence adjustment factor to the population of 15 to 17 year olds of 6% and an adjustment factor of 17.98%to the population of 18 to 64 year olds. Based on the findings of Milliken et al,[1] we applied a mental health incidence adjustment factor to the MTF enrolled population of 20.3%.

A comparison of the rate of off-base civilian providers (1) per 1,000 persons enrolled in an MTF, adjusted for mental health issue incidence, and (2) per 1,000 persons between 15 and 64 in an installation's vicinity, adjusted for the incidence of mental health issues, allows us to understand the potential demand on the OCMHPN. A simple example illustrates why our dual rate approach sheds substantial light on the potential spatial accessibility of the OCMHPN. In the 40-mile buffer around Camp Pendleton, the rate of off-base civilian mental health providers per the 1,000 persons enrolled in the Camp Pendleton MTF is 18 once the MTF population is adjusted for mental health issue incidence (Table II). In contrast, the rate of off-base civilian mental health providers per 1,000 persons aged 15 to 64 who reside in the 40-mile buffer around Camp Pendleton is 0.6 once the population is adjusted for mental health issue incidence (Table II). In our example, the relative value of the general population tells us that the population density (and thus potential users of the OCMHPN) around Camp Pendleton is exceedingly high. In turn, a comparison of the two rates tells us that even if the count of providers around Camp Pendleton is high, it is only properly understood as high until we control for the potential civilian demand for the services of these providers.

TABLE II. Rate of TRICARE Providers Adjusted for TRICARE Acceptance Per 1,000 Persons in the 40-Mile Buffer Band Adjusted for Mental Health Issue Incidence and Per 1,000 Persons Enrolled in an MTF Adjusted for Mental Health Issue Incidence

	Adjusted Rate Per 1,000 Population (15–64)	Adjusted Rate Per 1,000 Enrolled in the MTF
Drum	1.4	3.08
Hood	1.17	4.67
Lejeune	1.03	6.21
Pendleton	0.57	18.21
Schofield	0.59	15.67

We used two administrative boundaries to define the geographic study area around each of the five installations examined. The first boundary is a 40-mile buffer around an installation. Military Health Services (MHS) uses this boundary to define the area within which service persons enrolled in an installation's MTF can receive a referral and/or inpatient care.[20] The second boundary is an approximation of the time-based boundary (30-minute drive time) that MHS intends to use to delineate the area around an MTF that a person can receive outpatient care.[21] MHS calls this geographic boundary the Primary Requirement Integrated Specialty Model (PRISM) area.

We also analyzed the spatial distribution of off-base, civilian, mental health providers in two additional proximity bands (20- and 10-minute drive time bands). In Figure 1, we present a map of the 40-mile buffer and 30-minute drive time band for Camp Pendleton. In the Results section, we only present our analysis of the 40-mile buffer band as the substantive findings we drew from the various bands were essentially the same.

In the process of implementing this article's analyses, several data-related issues connected to the accessibility of the TRICARE mental health care system came to the fore. First, there are no reliable data on "provider availability." Our analysis assumes that providers are available at a rate based on Avery and MacDermid's[22] TRICARE Prime provider availability rate estimation.

Second, no reliable data exists that provides information about whether a given provider is "trained to treat military or military family patients." Our selection of professional classifications assumes that the providers are capable of treating military-specific issues in addition to mental health issues experienced by the general population.

Third, there is no available cross-region data that can be used to assess the qualifications of the providers examined. We were forced to assume that the "quality of care and provider competence" in the off-base population of mental health providers is invariant across location.

Fourth, using an administrative distance band boundary as our scale of analysis assumes that subpopulations of patients and dependents are "indifferent to effort associated

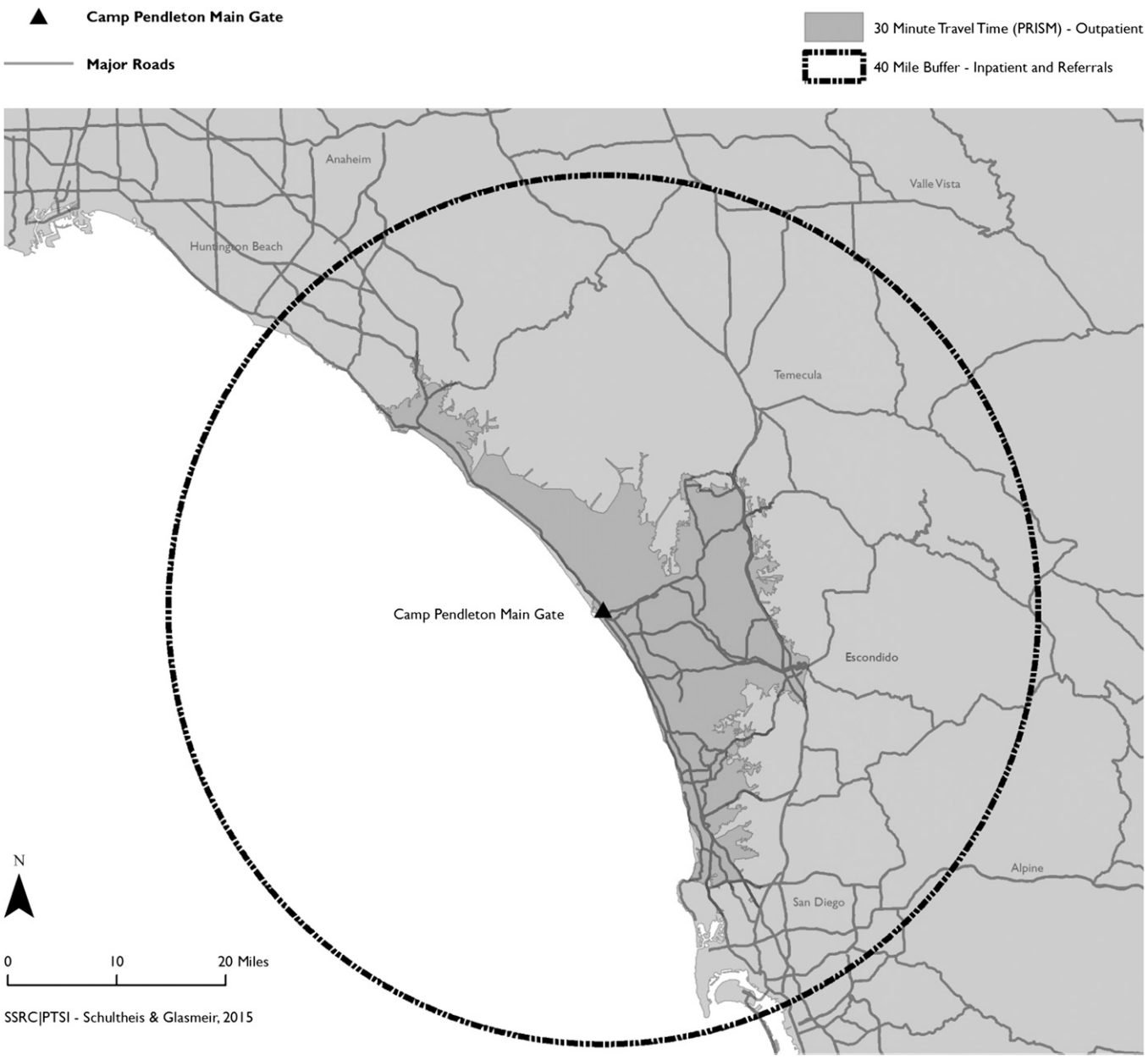

FIGURE 1. 40-mile and 30-minute buffer bands around Camp Pendleton.

with variations in travel time." Research suggests that different segments of a potential user population are, in fact, not indifferent to such variation and 40 miles of travel means something different to a single male adult than a single mother of three.[23–25]

RESULTS

We use frequency tables of providers by category to report the findings of our empirical work. This approach increases the overall clarity of our results. In Table III, we present summary population estimates and the number of MTF TRICARE beneficiaries around each installation who are likely to require mental health care. We estimated the estimated population within 40-mile buffer area and the 30-minute drive time by implementing proportional area allocation with 2010 Census Block Group population data. The estimate includes both civilian and service persons who reside in the 40-mile buffer. This population estimate was then adjusted based on the incidence of mental health issues. We used the TRICARE Operations Center's TRICARE Prime FY2013 beneficiary data to estimate the MTF enrolled population.

In Table IV, we present the percentage share of the total provider population by provider type in each of the three RCCPNs based on the installations that we examined.

Each of the RCCPNs favors different mixes of mental health providers. For instance, HealthNet (North RCCPN)

TABLE III. Incidence Adjusted Population Estimates and MTF TRICARE Enrolled Beneficiaries

	Adjusted 40-Mile Buffer Population	Adjusted 30-Minute Drive Time Population	Adjusted Population Enrolled in the MTF
Drum	19,582	10,649	9,101
Hood	66,994	27,933	17,142
Lejeune	51,612	15,852	8,700
Pendleton	423,585	109,015	13,562
Schofield	108,646	82,915	4,147

and Humana (South RCCPN) rely heavily on mental health counselors, whereas United Healthcare (West RCCPN) providers are overwhelmingly from more traditional, credentialed professions (i.e., psychology, psychiatry, social work, and marriage and family therapy). One implication of these preferences is that it seems likely that there is substantial variability across the RCCPNs in the type, and perhaps quality, of care available to service persons and their families. A service person or a member of their family who needs psychiatric care and is unable to obtain this care at the MTF faces a distinctly different situation in Camp Pendleton than s/he would face if s/he were stationed at Camp Lejeune. Whatever the appropriate level of care a service person or a member of their family needs, the availability of care by provider type varies substantially by RCCPN.

In Table V, we list the percent and count of providers by category within the 40-mile buffer band for each of the five bases studied. We use the following abbreviations in Table V.

In Table V, total column does not always equal the sum of the values of the various provider categories because some providers are listed under multiple categories. We created the provider category counts by grouping unique names within a given provider category, and the total category counts were created by grouping unique names across all provider types. For instance, Provider A might be listed under both the psychiatrist and psychologist categories. In the individual provider category columns, Provider A would count as two entries. However, to generate Total, we collapsed all the providers in a given geographic area based on a unique name. In Total, Provider A would thus only be counted as one provider. The difference between the total and the sum of the provider categories should be understood as the result of cross-category listing of the same provider.

There is a strong correlation between the adjusted population that resides in an installation's 40-mile buffer and the count of providers in the 40-mile buffer ($r = 0.9875$). Surprisingly, there is only a modest correlation between the adjusted number of persons enrolled in an installation's MTF and the count of providers in the 40-mile buffer ($r = 0.419$). These correlation coefficients suggest that the number of providers in an installation's vicinity may be more a function of the overall population density around an installation than a response to the specific needs of beneficiaries enrolled in an MTF. Studies of additional installations are required to confirm this supposition.

In Table II, we list the rate of providers per 1,000 persons enrolled in an installation's MTF and per 1,000 persons who reside in the 40-mile buffer. We adjusted the rates for both populations based on the incidence of mental health issues. We also adjusted the number of providers used in the rate based on Avery and MacDermid's[22] estimate of TRICARE providers listed in official provider lists who actually accept TRICARE. In an effort to err on the side of caution, we assumed a higher level of TRICARE provider availability (35%) than Avery and McDermid's estimation that only 25% of TRICARE providers in the official lists accept TRICARE. When we calculate the incidence adjusted rate of

TABLE IV. Provider Type by RCCPN as a Percentage of All Providers in the Study Area Examined

	Proportion of All Providers Considered in a RCCPN by Type—Percent (Count)		
	North (HealhNet)	South (Humana)	West (United Healthcare)
Psychiatrist	14% (30)	9% (20)	18% (164)
Psychologist	19% (45)	14% (32)	35% (308)
Mental Health Counselor	26% (61)	32% (72)	3% (26)
TRICARE Mental Health Counselor	None in Study Areas (0)	10% (27)	NA (NA)
Social Worker	33% (78)	19% (43)	16% (141)
Marriage and Family Therapist	7% (17)	15% (33)	28% (251)

TABLE V. Unadjusted Percent and Count of TRICARE Providers by Type in the 40-Mile Buffer Band

	Total	Psychiatrist	Psychologist	Social Worker	Marriage and Family Therapist	Mental Health Counselor	TRICARE Mental Health Counselor
Drum	100% (79)	23% (18)	20% (16)	37% (29)	3% (2)	22% (17)	0% (0)
Hood	100% (227)	9% (20)	14% (32)	19% (43)	15% (33)	32% (72)	12% (27)
Lejeune	100% (152)	10% (15)	19% (29)	32% (49)	10% (15)	29% (44)	0% (0)
Pendleton	100% (703)	18% (126)	29% (201)	17% (117)	34% (239)	<1% (23)	NA
Schofield	100% (183)	21% (38)	59% (107)	13% (24)	7% (12)	2% (3)	NA

providers per 1,000 beneficiaries enrolled in an installation's MTF, Camp Pendleton (18) and Schofield Barracks (16) have substantially higher rates of providers relative to the incidence adjusted MTF-enrolled population than Fort Hood (4.7), Fort Drum, (3.1), or Camp Lejeune (6) (Table II). In contrast, if we calculate the incidence-adjusted rate of providers per 1,000 persons who reside in the 40-mile buffer, a rough measure of all sources of possible demand on providers, we observe that Camp Pendleton and Schofield Barracks have "lower" rates of providers than Fort Drum, Fort Hood, and Camp Lejeune (Table II).

Lastly, regardless of installation size, there tends to be a cluster of mental health providers in the immediate vicinity of an installation. Whether such clusters are sufficient to meet demand for mental health services is outside of the scope of the present study. However, it appears that the geographic context within which an installation is located may impact whether this immediately proximate cluster of providers can satisfy demand. In densely populated areas, off-base civilian providers are spatially distributed throughout an installation's entire 40-mile buffer. The distribution of providers around Schofield Barracks and Camp Lejeune are illustrative of this phenomenon. In contrast, this is not true of installations located in sparsely populated areas. For instance, there are few providers aside from the cluster in the immediate vicinity of Fort Drum. In this case, if the providers clustered around the base are unable to meet the mental health needs of service persons and their families, there are few if any more distant providers within the 40-mile buffer who could satisfy the unmet demand. Broadly speaking, this phenomenon illustrates the geographically varied capacity of the OCMHPN to meet the needs of service persons and their families.

DISCUSSION

Our analyses of the OCMHPN around the five study areas (Camp Lejeune, Camp Pendleton, Fort Drum, Fort Hood, and Schofield Barracks) support conclusions at the RCCPN and national scales. The current research yields findings of a descriptive nature. This is unsurprising in the absence of any preexisting baseline knowledge of the OCMHPN. Nonetheless, we believe that these descriptive findings support the need for future research efforts on the spatial characteristics of the OCMHPN.

We will now focus our attention on several conclusions about the off-base TRICARE civilian mental health systems, the three RCCPNs, and the role the RCCPNs play in meeting the mental health needs of service persons and their families.

First, the appropriate unit of analysis for mental health issues is the family and this scale requires an examination of the OCMHPN. A research effort focused solely on the on-base mental health care system for service persons fails to take into account, a substantial portion of the care delivery system and its users.

Our second conclusion is that the RCCPNs (i.e., United Healthcare, Humana, and HealthNet), each favor very different mixes of mental health provider types. For instance, HealthNet (North RCCPN) and Humana (South RCCPN) rely heavily on mental health counselors, whereas, United Healthcare (West RCCPN) providers are overwhelmingly providers from traditional and credentialed professions (i.e., psychology, psychiatry, social work, and marriage and family therapy). Whatever the appropriate level of care a soldier or soldier's family member needs, the availability of such care in the OCMHPN varies substantially by RCCPN.

The difference in the preferred mix of providers by RCCPN presages a possible disruption to the OCMHPN's ability to meet the needs of service persons and their families. Beginning in 2015, federal regulations mandate that care provided by mental health counselors will no longer be reimbursed and that providers currently in this category must qualify as TRICARE mental health counselors to continue to be "in-network."[26] The impact of this regulation will likely be minimal in the West RCCPN because this RCCPN favors provider types other than mental health counselors. In contrast, both the North and South RCCPNs heavily rely on mental health counselors. Given the heightened credentialing requirements to become a TRICARE mental health counselor, it is likely that some percentage of current mental health counselors will either choose not to obtain the TRICARE mental health counselor certification or simply be unable to meet the new credentialing requirements. The fact that many of the MTFs in these RCCPNs are located in fairly remote areas where civilian providers are already likely in short supply heightens the gravity of the situation. The current scenario begs the question of how the RCCPNs will ensure that a sufficient number of qualified behavioral health providers are accessible to service persons and their families stationed at installations located in sparsely populated areas.

Our third conclusion is that, regardless of installation size, there tends to be a cluster of mental health providers in the immediate vicinity of an installation. Whether these clusters are sufficient to meet demand for mental health services is outside the scope of the present study and this study does not examine whether policy promulgated by the TRICARE Management Agency (TMA) or DoD is responsive to and recognizes this variability in the spatial distribution of mental health providers. However, at a minimum, TMA should establish general provider density standards for PRISMs or Primary Service Area and require the RCCPNs to evaluate the provider density needed in each PRISM and Primary Service Area based on the potential user population and estimated civilian demand. Further, the TMA and DoD should define provider accessibility standards at the network scale. Current accessibility standards are both ill-defined[27–29] and directed at individual patient accessibility[30] as opposed to network accessibility. The latter fact is particularly troubling, as the TRICARE network exhibits emergent accessibility issues not visible at the individual level.

Our final conclusion is that accessibility analyses that focus solely on the number of providers around an installation are likely to come up short. An assessment of an OCMHPN's ability to meet the needs of services persons and their families must account for the dual sources of demand on the OCMHPN, namely, the demand generated by the MTF and demand generated by the civilian population.

ACKNOWLEDGMENTS

The Sociotechnical Systems Research Center's Post Traumatic Stress Innovations Project (SSRC|PTSI) at the Massachusetts Institute of Technology facilitated this research. SSRC|PTSI, project W81XWH-12-2-0016, is sponsored by the U.S. Army Medical Research and Material Command. The U.S. Army Medical Research Acquisition Activity, 820 Chandler Street, Fort Detrick, Maryland, is the awarding and administering acquisition office.

REFERENCES

1. Milliken CS, Auchterlonie JL, Hoge CW: Longitudinal assessment of mental health problems among active and reserve component soldiers returning from the Iraq War. JAMA 2007; 298: 2141–8.
2. Blakely K, Jansen D: Post-traumatic stress disorder and other mental health problems in the military: oversight issues for Congress. Congressional Research Service 2013, August 8. Available at https://www.fas.org/sgp/crs/natsec/R43175.pdf; accessed August 22, 2014.
3. Khan A: An integrated approach to measuring potential access to health care services. Socioecon Plann Sci 1992; 26(4): 275–87.
4. Patel A, Balmer NJ, Pleasance P: Geography of advice seeking. Geoforum 2008; 39(6): 2084–96.
5. Wang F: Measurement, optimization, and impact of health care accessibility: a methodological review. Ann Assoc Am Geogr 2012; 102(5): 1104–12.
6. Luo W, Wang F: Measures of spatial accessibility to health care in a GIS environment: synthesis and a case study in the Chicago region. Environ Plann B 2003; 30(6): 865–84.
7. Comber A, Brundson C, Hardy J, Radburn R: Using GIS-based network analysis and optimization routines to evaluate service provision: a case study of the UK Post Office. Appl Spat Anal Policy 2009; 2(1): 47–64.
8. Guagliardo MF: Spatial accessibility of primary care: concepts, methods and challenges. Int J Health Geogr 2004; 3(1): 3.
9. Rosero-Bixby L: Spatial access to health care in Costa Rica and its equity: a GIS-based study. Soc Sci Med 2004; 58(7): 1271–84.
10. Gorman LA, Blow AJ, Ames BD, Reed PL: National Guard families after combat: mental health, use of mental health services, and perceived treatment barriers. Psychiatr Serv 2011; 62(1): 28–34.
11. Kim P, Thomas J, Wilk J, Castro C, Hoge C: Stigma, barriers to care, ad use of mental health services among active duty and National Guard soldiers after combat. Psychiatr Serv 2010; 61(6): 582–8.
12. Britt TW: The stigma of mental health problems in the military. Mil Med 2007; 172(2): 157–61.
13. Office of Public and Intergovernmental Affairs: VA grants will expand transportation in highly rural areas. U.S. Department of Veterans Affairs 2014, July 11. Available at http://www.va.gov/opa/pressrel/pressrelease.cfm?id=2581; accessed August 22, 2014.
14. Federal Transit Administration: U.S transportation Secretary LaHood announces $29 million to help veterans and military families connect to jobs and more by tapping local transportation. U.S. Department of Transportation 2012, July 2. Available at http://www.fta.dot.gov/newsroom/news_releases/12286_14730.html; accessed August 22, 2014.
15. VA Mental Health Care: Addressing wait times and access to care: hearing before the Committee on Veterans' Affairs of the United States Senate. 112th Congress, 1st Session 2011, November 30. Available at http://www.gpo.gov/fdsys/pkg/CHRG-112shrg72248/pdf/CHRG-112shrg72248.pdf; accessed August 22, 2014.
16. Johnson SJ, Sherman MD, Hoffman JS, et al: The Psychological Needs of U.S. Military Service Members and Their Families: A Preliminary Report. Washington, DC, American Psychological Association, 2007.
17. Mansfield AJ, Kaufman JS, Marshall SW, Gaynes BN, Morrisey JP, Engel CC: Deployment and the use of mental health services among US Army wives. N J Med 2010; 362(2): 101–9.
18. Wang P, Lane M, Olfson M, Pincus H, Wells K, Kessler R: Twelve-month use of mental health services in the United States: results from the National Comorbidity Survey replication. Arch Gen Psychiatry 2005; 62: 629–40.
19. Kataoka SH, Zhang L, Wells KB: Unmet need for mental health care among U.S. children: variation by ethnicity and insurance status. Am J Psychiatry 2002; 159: 1548–55.
20. Lyle A: Officials announce TRICARE Prime service area changes. American Forces Press Service 2013, January 10. Available at http://www.defense.gov/news/newsarticle.aspx?ID=118969; accessed August 22, 2014.
21. TRICARE Management Authority: Evaluation of the TRICARE program FY 2012. TRICARE Management Authority 2012. Available at http://tricare.mil/tma/dhcape/eval/2012/; accessed August 22, 2014.
22. Avery GH, MacDermid SM: Access to mental health services for active duty and National Guard TRICARE enrollees in Indiana. Mil Med 2011; 176(3): 261–4.
23. Hawthorne TL, Kwan MP: Using GIS and perceived distance to understand the unequal geographies of healthcare in lower-income urban neighborhoods. Geogr J 2012; 351(1): 13–22.
24. Kwan MP: Gender, the home-work link, and space-time patterns of nonemployment activities. Econ Geogr 1999; 75(4): 370–94.
25. Schwannen T, Kwan MP, Ren F: How fixed is fixed: gendered rigidity of space-time constrains and geographies of everyday activities. Geoforum 2008; 39(6): 2109–21.
26. Defense Health Agency: TRICARE Policy manual 6010.57-M, Chapter 11(§ 3.11). USA: Defense Health Agency, 2008. Available at http://manuals.tricare.osd.mil; accessed August 22, 2014.
27. 32 C.F.R. § 199.4 (2012). Available at http://www.law.cornell.edu/cfr/text/32/199.4; accessed August 22, 2014.
28. 32 C.F.R. § 199.5 (2012). Available at http://www.law.cornell.edu/cfr/text/32/199.5; accessed August 22, 2014.
29. 32 CFR § 199.17 (2011). Available at http://www.law.cornell.edu/cfr/text/32/199.7; accessed August 22, 2014.
30. Defense Health Agency: TRICARE Operations Manual 6010.56-M, Chapter 5. USA: Defense Health Agency, 2008. Available at http://manuals.tricare.osd.mil; accessed August 22, 2014.