
Proximity of Providers

Colocating Behavioral Health and Primary Care and the Prospects for an Integrated Workforce

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Integrated behavioral health and primary care is emerging as a superior means by which to address the needs of the whole person, but we know neither the extent nor the distribution of integration. Using the Centers for Medicare and Medicaid Services' National Plan and Provider Enumeration System (NPPES) Downloadable File, this study reports where collocation exists for (a) primary care providers and any behavioral health provider and (b) primary care providers and psychologists specifically. The NPPES database offers new insights into where opportunities are limited for integration due to workforce shortages or non-proximity of providers and where possibilities exist for collocation, a prerequisite for integration.

Keywords: health policy, integrated care, workforce, primary care, behavioral health

The inseparability of mental and physical health has led to a variety of clinical models that integrate behavioral health providers into primary care (Butler et al., 2008; Collins, Hewson, Munger, & Wade, 2010; Kwan & Nease, 2013). For example, some models incorporate care managers who often focus on mental health conditions such as depression (L. M. Dickinson et al., 2005; Unützer et al., 2002), while others have behavioral health providers addressing a range of mental health conditions at the point of care (Blount, DeGirolamo, & Mariani, 2006; Brown Levey, Miller, & deGruy, 2012; Miller, Mendenhall, & Malik, 2009; Robinson & Reiter, 2007). Increasing recognition of the value of these integrated models to patient outcomes is enhancing support for implementation in several health systems. For example, the integrated model employed by the Veterans Health Administration allows an estimated 75% of patients with a mental health condition to have their needs addressed in primary care (Pomerantz et al., 2010).

Integrated care is not widely available yet, and our fragmented, dual systems leave people short of receiving what is possible in a comprehensive and integrated system (Brown Levey et al., 2012; Hogan, 2003; Kwan & Nease, 2013). Primary care and behavioral health integration aligns with the goals of the Triple Aim (improving the patient experience of care, improving the health

of populations, and reducing health care costs; Berwick, Nolan, & Whittington, 2008) and other national health care priorities (e.g., the patient-centered medical home; Croghan & Brown, 2010; W. P. Dickinson & Miller, 2010; Miller & Patel, 2011; Miller, Talen, & Patel, 2013), increasing the policy imperative for finding ways to make such care more available.

Identifying Opportunities for Integrating Behavioral Health and Primary Care

Despite increasing awareness of these vanguard practices, little is known at the state and national levels about (a) the number and location of primary care practices with integrated behavioral health, (b) where the potential for collaboration exists through provider proximity, or (c) where integration cannot occur due to the absence of one or the other type of provider. The latter problem is particularly common. For example, when Cunningham (2009) surveyed 6,600 primary care physicians about their ability to access mental health services, he found that two thirds of those surveyed could not gain access to mental health services for their patients, often because of shortages of behavioral health care providers. Studies have shown that even where these relationships exist, there are systemic barriers to sustaining collaboration.

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The Cunningham study also identified health insurance obstacles and lack of health care coverage as barriers to accessing mental health and collaboration. We were most interested in understanding where there was proximity potential for collaboration since colocation is essential to integration. We sought to create a national-level snapshot of colocation to provide a geographic inventory of where integration efforts are more likely and where this primary problem of proximity remains a barrier.

Identifying opportunities for integrating behavioral health and primary care on a national scale is challenged by disconnected workforce data for these two provider groups. The physician workforce and the behavioral health workforce have separate educational pathways, specialty organizations, licensing and certifying bodies, and regulatory mechanisms. The American Medical Association (AMA) Physician Masterfile provides specialty and practice location information on physicians by compiling data from multiple sources. According to the Masterfile, more than 246,000 physicians with a primary care specialty were classified as working in direct patient care in 2010. The Masterfile overestimates the number of active primary care physicians by including some retired physicians, primary care-trained hospitalists, medical residents, and emergency department physicians. After discounting for these physicians, an estimate of 209,000 primary care physicians is likely more accurate (Pettersson et al., 2012).

The AMA Masterfile is similarly helpful for enumerating and locating psychiatrists, but there is no equivalent master file for the much larger pool of other behavioral health providers. This is an important problem because the role of psychologists and social workers

has become increasingly common and the presence of psychiatrists has decreased (Miller & Druss, 2013; Scheffler & Kirby, 2003; Substance Abuse and Mental Health Services Administration, 2012). About 15 years ago there were nearly twice as many psychologists as psychiatrists and about twice as many clinical social workers as psychologists in the behavioral health workforce (Ivey, Scheffler, & Zazzali, 1998). Additionally, there were roughly as many other types of master's-level behavioral health professionals (e.g., marriage and family therapists, substance abuse counselors) as master's-level social workers (Cummings, 1995). The number of clinically trained doctoral psychologists has doubled from 45,000 in 1983 to an estimated 93,000 in 2012 (American Psychological Association, 1996; American Psychological Association Center for Workforce Studies, n.d.).

Geography and Mental Health Services

While the behavioral health workforce has grown substantially in the past few decades, its geographic distribution has not aligned with the distribution of the U.S. population, leaving many parts of the country underserved (Robiner, 2006). Behavioral health providers tend to practice in more affluent areas with better behavioral health insurance coverage and higher educational attainment (Bird, Dempsey, & Hartley, 2011; Knesper, Wheeler, & Pagnucco, 1984).

Baldwin et al. (2006) examined mental health licensing and survey data in Washington state and found that urban areas had more than three times the number of psychiatrists (full time equivalents) than rural areas. This is not unique to Washington state, nor is it a new development. Reports from 1999 research by the U.S. Department of Agriculture Economic Research Service found that the distribution of the psychiatric workforce has remained predominately urban with a modest shift away from the largest urban areas (Scheffler & Kirby, 2003). Other authors have noted the challenge of recruiting and retaining behavioral health professionals in rural areas. (Ivey et al., 1998).

This article aims to use different and more recently available data to simultaneously examine and assess the number and location of behavioral health and primary care providers in order to determine where these providers are collocated (such that proximate, integrated services are feasible) and where they are not.

National Provider Identification Data

Our analysis uses data from the Centers for Medicare and Medicaid Services' National Plan and Provider Enumeration System (NPPES) Downloadable File. These data include all health providers with a National Provider Identifier (NPI), a 10-digit identifier unique to each provider that permits submission of HIPAA-compliant claims to all payers. Most insurers and all health care clearinghouses have required providers to use NPI numbers in their transactions since 2007. The physician data include residents, most of whom obtain an NPI number



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early in their residencies. These data are available in the public domain and are updated on a quarterly basis. Provider practice addresses are available in the NPPES data, and we geocoded them to obtain longitude and latitude coordinates. About 97% of the addresses were geocodable. We used these coordinates to locate a practice in its specific county. We then used the Rural–Urban Continuum Codes (RUCC) classification as a measure of county rurality (United States Department of Agriculture Economic Research Service, 2003). State and county population counts are from the 2010 Census. The NPI data include self-reported specialty and profession. Primary care physicians are those in family medicine, general internal medicine, general pediatrics, geriatrics, and general practice. Behavioral health providers include psychiatrists, psychologists, social workers, marriage and family therapists, and mental health counselors.

To identify primary care physicians colocated with either behavioral health providers or psychologists, we used five-digit longitude and latitude coordinates. At this level of precision, there is a 1.1-m buffer around a particular point, meaning that we are effectively identifying practices that share the same building (with four-digits, there is a 11.1-m buffer, which could include neighboring buildings). For each unique X–Y coordinate we obtained counts of psychologists, other behavioral health providers, all behavioral health providers, and primary care physicians to determine colocation of these providers.

Numbers and Ratios of Behavioral Health Providers and Primary Care Physicians

The NPPES database identified 75,248 psychologists, 283,000 primary care physicians, and 420,000 total be-

havioral health providers in the United States in 2010 (see Table 1). There were approximately 1.3 behavioral health providers for every primary care physician in the United States in 2010 (Table 1). Psychologists made up nearly one fifth of the behavioral health workforce, and there were approximately 4.3 psychiatrists, social workers, or marriage and family therapists for every psychologist (see Figure 1).

Geographic Distribution of Behavioral Health and Primary Care

Figure 2 shows the number of psychologists per 100,000 persons by county in the United States. The results confirm prior findings of significant geographic maldistribution in the behavioral health workforce. In general, psychologists are concentrated in the West, the Northeast, and several states in the Midwest. With the exception of south Florida, the South in general and states along the Gulf of Mexico in particular have fewer psychologists per capita than the rest of the country. The map also indicates significant intrastate variation. Within the same state, counties can have as few as none to as many as 303 psychologists per 100,000 persons. This is due to psychologists clustering in urban areas (Table 1). The number of psychologists per 100,000 declines from 29 in the most urban counties to 4.2 in the most rural counties. There is a less dramatic decline for primary care physicians.

There is a strong, positive association between the per capita number of primary care physicians and the per capita number of psychologists across states (see Figure 3). These data range from 14% in Mississippi to 65% in Vermont. There are a number of states with 20–30 psychologists and 110–120 primary care physicians per 100,000. States such as Massachusetts, Vermont, Minnesota, and Hawaii have both more psychologists and more primary care providers per capita than other states.

Colocation by Urban/Rural and State

Approximately 29% of primary care physicians are colocated with psychologists, and 43% are colocated with any behavioral health provider (see Table 2). As rurality increases, the percentage of primary care physicians co-located with a behavioral health provider decreases, with a sharper decline for psychologists. Comparing the most urban areas (RUCC 1) to the most rural areas (RUCC 9), the percentage of primary care physicians colocated declines from 31.3 to 6.4 per 100,000 persons, more than a 75% decline. There is a 53% decrease in the colocation rate between the most urban and the most rural areas.

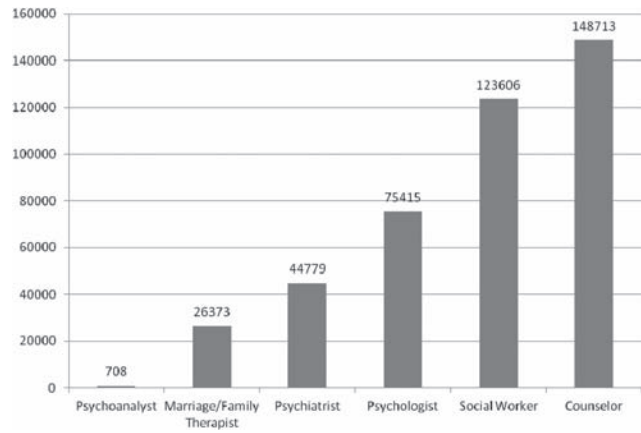
At the state level, colocation of primary care physicians with psychologists varies from 14% in South Dakota to 50% in Rhode Island; their co-location with behavioral health providers varies from 27% in New Jersey to 65% in Massachusetts (see Figure 4). There is a positive relationship between the state supply of psychologists and the percentage of primary care physicians colocated with psychologists ($r = .58$). There is a corresponding strong positive association across states between the number of behavioral health providers and



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their colocation with primary care providers ($r = .73$). States such as Rhode Island, Minnesota, and Massachusetts have relatively more psychologists and behavioral health providers as well as higher levels of colocation. Interestingly, Vermont stands out as having a very high per capita number of psychologists but an average level of colocation. At the other extreme, we find a mixture of southern states among states with fewer psychologists. However, primarily southern states such as Alabama, Louisiana, and Mississippi have both fewer psychologists and fewer behavioral health providers as well as

Figure 1
Behavioral Health Providers by Type



low levels of colocation. By contrast, a number of more rural states such as South Dakota, Idaho, and Wyoming have fewer psychologists per capita than other states but are closer to the median with respect to the number of behavioral health providers.

Limitations

Using NPI to assess colocation does not mean that providers are collaborating or truly integrated. Proximity is not always indicative of collaboration, and just because providers are within one meter of each other does not mean that they are interacting clinically or sharing patients. We do not currently have data to support a true count of integrated, collaborating

Table 1
Counts and Rates of Primary Care Physicians, Behavioral Health Providers, and Psychologists by Rural–Urban Continuum Code

Rural–urban continuum code (RUCC) ^a	Number of providers			Rates per 100,000		
	Primary care physicians	Behavioral health providers	Psychologists	Primary care physicians	Behavioral health providers	Psychologists
1	160,486	244,593	47,744	97.4	148.4	29.0
2	57,931	88,356	14,503	93.2	142.2	23.3
3	25,800	39,755	6,069	83.9	129.3	19.7
4	10,152	14,053	1,951	65.8	91.0	12.6
5	4,853	8,547	1,131	81.5	143.5	19.0
6	9,421	10,611	1,304	59.6	67.1	8.3
7	6,197	8,583	1,087	72.3	100.2	12.7
8	1,138	977	110	45.5	39.0	4.4
9	1,473	1,135	115	53.4	41.2	4.2
NA	5,322	2,184	1,234	132.8	54.5	30.8
Total	282,773	418,794	75,248	90.4	133.9	24.1

Note. NA (not applicable) includes Puerto Rico and nongeocodable addresses.
^a Rurality increases as RUCC increases; that is, 1 is the most urban and 9 is the most rural.



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practices. Further research that combines NPI data with health insurance claims data may be a next opportunity to examine what happens in these practices, but direct evaluation may be

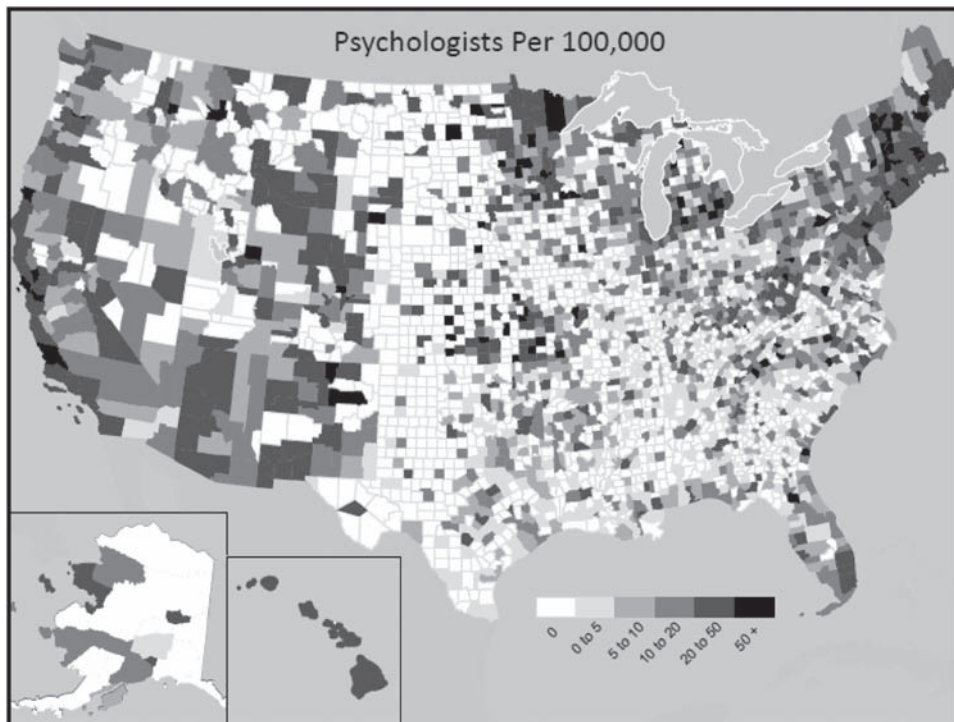
more fruitful at this stage and could guide development of better monitoring tools.

An additional limitation is that the NPI database overcounts providers for many of the reasons we've explained. Medicare should purge the NPI of retired providers and should flag those not providing care or only doing so part time. Another limitation is that some large systems use a single address for all of their providers (e.g., the Mayo Clinic), which gives the appearance of colocation.

Opportunities for Psychology

This study extends previous reports of counts and distributions of providers by types to show where colocation existed in 2010 for (a) primary care providers and any behavioral health provider in the NPPES system and (b) primary care providers and psychologists specifically. Where colocation occurs, there is opportunity to do further research on the nature of the relationships in these locations and to explore policy or payment interventions that may enhance the benefits of colocation. The NPPES database offers potential for new insights into where opportunities are limited for integration due to workforce shortages or nonproximity of providers. These areas will require different infrastructure and policy solutions involving issues such as workforce policy, telehealth, shared behavioral health models (as with the

Figure 2
Psychologists per 100,000 by U.S. County





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Vermont Blueprint for Health), academic health center extension services, or even clinic conversion to a Federally Qualified Health Center or a Rural Health Clinic in order to obtain additional staffing resources.

Policy Implications

While there is growing evidence of the benefits of integrated efforts, in many cases health care policy has not changed to accommodate this new delivery model (Kathol, Butler, McAlpine, & Kane, 2010). This article

Table 2
Percentage of Primary Care Physicians Colocated With Psychologists and All Behavioral Health Providers by Rural–Urban Continuum Code

Rural–urban continuum code (RUCC) ^a	Primary care/psychologist colocated		Primary care/behavioral health colocated	
	%	95% CI	%	95% CI
1	31.3	[31.0, 31.5]	45.9	[45.7, 46.1]
2	27.4	[27.0, 27.8]	43.4	[43.0, 43.8]
3	25.5	[24.9, 26.1]	40.3	[39.8, 40.8]
4	14.2	[13.4, 15.1]	26.8	[26.1, 27.5]
5	18.3	[16.9, 19.6]	33.9	[32.8, 34.9]
6	10.8	[10.0, 11.7]	23.3	[22.6, 23.9]
7	11.9	[10.8, 12.9]	25.8	[24.9, 26.6]
8	7.4	[4.9, 9.8]	23.4	[21.9, 24.9]
9	6.4	[4.3, 8.5]	21.7	[20.4, 22.9]
NA	68.8	[67.6, 70.0]	73.3	[72.1, 74.6]

Note. NA (not applicable) includes Puerto Rico and nongeocodable addresses.

^a Rurality increases as RUCC increases; that is, 1 is the most urban and 9 is the most rural.

begins the process of assessing where in the country collocation of behavioral health and primary care may signal that integration is possible, where it may be occurring, and where it could be strengthened. And while there are certainly federal policy options that can be considered here, the considerable behavioral workforce variation we've identified within states suggests that local and state level policy will also be important. Below we outline broad policy recommendations based on our analysis that could help spread integration.

Training, Education, and Workforce

It is not possible to integrate care where there are no behavioral health providers. These shortage areas require comprehensive, long-term policies that help recruit and retain providers; or they need alternative options that are less than full integration but that bring behavioral health services to primary care settings via telemedicine or shared resources among several practices.

- Federal and state incentive programs that recruit providers to work in underserved settings, like the National Health Services Corps (NHSC) program, typically focus on medical providers in their design and monitoring (Daniels, VanLeit, Skipper, Sanders, & Rhyne, 2007; Pathman, Konrad, & Ricketts, 1992). The Substance Abuse and Mental Health Services Administration could partner with the Health Resources and Services Administration, which administers the NHSC, to make behavioral services providers a higher priority. Further, these two agencies could cosponsor educational programs that prepare psychologists and other behavioral health providers to train and work together in primary care. In the

Figure 3
Per Capita Distribution of Primary Care Physicians and Psychologists by State

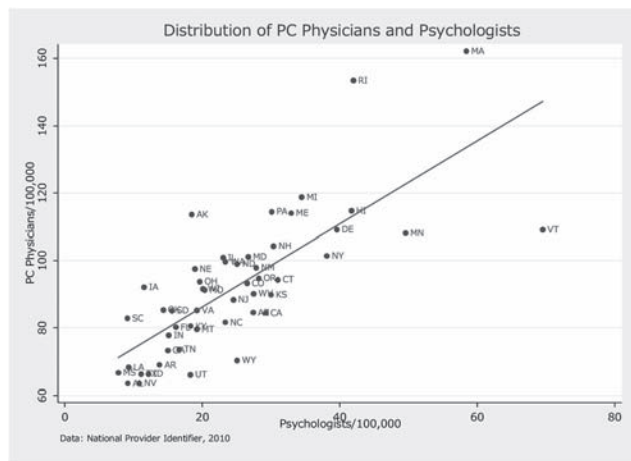
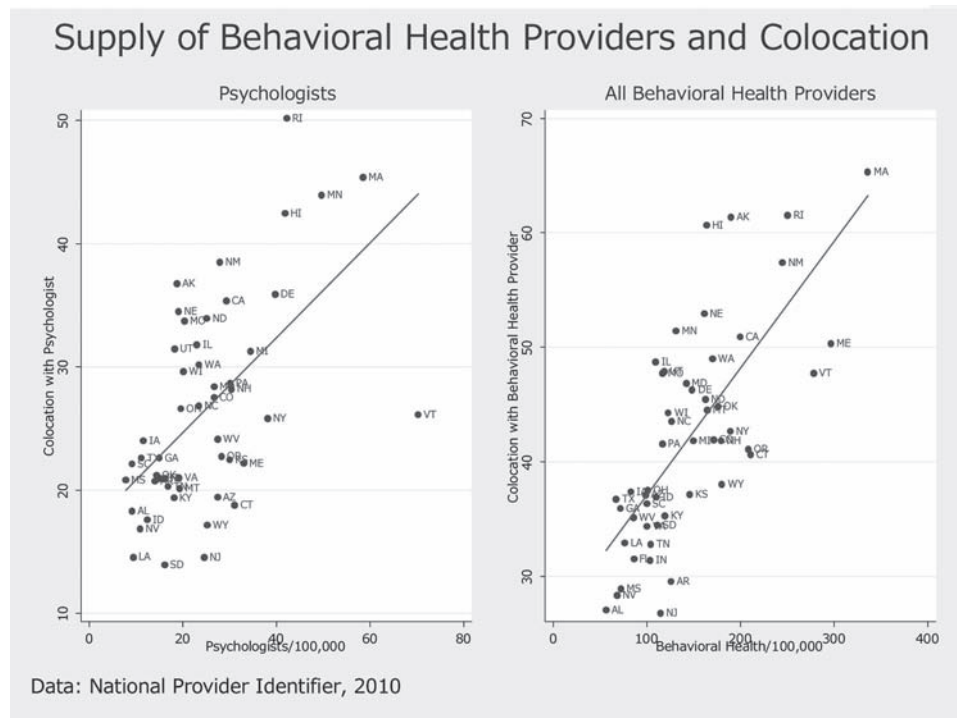


Figure 4

Supply of Psychologists and Behavioral Health Providers Colocated With Primary Care Per 100,000 People by State



interim, strategies such as telehealth, academic health center outreach partnerships, and shared behavioral health services between several clinics should continue to be explored as next-best alternatives to integrated behavioral health (Jennett et al., 2003).

- Creating and incentivizing opportunities for team-based training for medical and behavioral clinicians, and perhaps even retraining of currently colocated providers in the principles and practices of team-based care, will be important (Blount & Miller, 2009; Masters, Stillman, Browning, & Davis, 2005; McDaniel, Belar, Schroeder, Hargrove, & Freeman, 2002; Talen, Fraser, & Cauley, 2005). Just putting providers in shared space often leads to parallel play rather than true integration, and the evidence for outcomes and satisfaction clearly supports the latter.
- Additionally, primary care practices will need assistance accommodating behavioral health providers. Irrespective of how well the clinicians are trained, the practice itself needs to have systems and operational processes in place for rapid communication between clinician teammates, for developing shared care plans, and for working out roles and division of labor.

Payment Reform

One of the most problematic issues for integrating behavioral health with primary care remains the payment systems (Kathol et al., 2010). Consider that mental health largely remains “carved out” of physical health reimbursement practices. This payment schism is a most significant policy barrier for integration efforts, but it also affects care coordination and team-based training and leads to organizational and cultural barriers (Kathol et al., 2010; Phillips, Miller, Petterson, & Teevan, 2011).

- New payment models that are non-encounter-based and non-volume-based would allow for primary care and behavioral health to better integrate and have the opportunity to achieve financial viability. There are several payment demonstrations underway that include capitated or per-member-per-month payments, rather than or in addition to fee-for-service payments, to support the delivery of important services to a primary care patient panel. Some of these should explicitly support behavioral health and test related outcomes (Association of American Medical Colleges, 2011). A change in payment models would allow practices and providers to consider

ways they may better integrate (Kathol, deGruy, & Rollman, 2014).

Research

Identifying colocated practices opens up new opportunities for researching practice models and relationships between psychologists and other behavioral health providers in primary care. While substantial evidence exists supporting the integration of behavioral health and primary care (Butler et al., 2008; Kwan & Nease, 2013), there remain gaps in the research, confusion about terminology, and a limited understanding of the characteristics of integrated practices (BF Miller, Kessler, Peek, & Kallenberg, 2011; Peek & the National Integration Academy Council, 2013). Informing policy to advance effective integration in primary care practices will require a simultaneous understanding of the evidence base and gaps in the evidence where research can occur.

- The NPPES database is valuable for its capacity to identify the distribution of behavioral health and primary care clinicians, but it has important limitations that could be overcome with better management of these data and by combination with other data. There exists a need to transform the NPPES capacity into an actual, functional tool to support rational workforce planning. Similar to the UDS Mapping software used by the Health Resources and Services Administration (UDS Mapper, n.d.), this tool could help inform states and communities of where providers are located and of opportunities for possible integration. In order to better assist the expanding role of primary care in health care, psychologists could also use these tools to assess areas that need additional coverage and study them. For example, the maps clearly show locations where there are no psychologists or other behavioral health providers. These geographic areas still have behavioral health need regardless of how small the population (e.g., RUCC 8, 9), which is consistent with the literature on behavioral health workforce development and expansion (Baldwin et al., 2006; Ivey et al., 1998). The University of New Mexico Health Extension Rural Offices program monitors many types of health providers in every county, provides resources to shore up areas of greatest need, and organizes its workforce training to fill these gaps over time (The University of New Mexico, n.d.). All of these workforce issues could benefit from additional research that could also inform policymakers.

Conclusions

The evidence of benefit to people in integrated primary care settings compels considerations of how to get it

done. The NPPES database is valuable for its capacity to identify the distributions of behavioral health and primary care clinicians and assess where colocation is occurring. Behavioral health colocation is a prerequisite for integration of behavioral health in primary care, and such colocation exists in many places where integration could be enabled promptly with attention to training, education, and workforce issues, payment reform, and further research and analysis. The journey to integration through colocated practice is not presently feasible in some locations because of an absentee workforce and because it requires attention to capacity building in both the behavioral health and primary care physician workforce arenas. The NPPES database provides an opportunity to simultaneously analyze the distributions of behavioral health and primary care clinicians and, for the first time, show where in the United States behavioral health and primary care are actually colocated.

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