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Increasing Potential Access to Opioid Agonist Treatment in U.S. Treatment Shortage Areas

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Abstract

Opioid use disorders are a significant public health problem, affecting over 2 million individuals in the US. Although opioid agonist treatment, predominantly offered in licensed methadone clinics, is both effective and cost-effective, many individuals do not receive it. Buprenorphine, approved in 2002 for prescription by waived physicians, could improve opioid agonist treatment access for individuals unable or unwilling to receive methadone.

We examine the extent to which the geographic distribution of waived physicians has enhanced potential opioid agonist treatment access, particularly in non-metropolitan areas with fewer methadone clinics. We found that while the approximately 90% of counties classified as methadone clinic shortage areas remained constant, buprenorphine shortage areas fell from 99% of counties in 2002 to 51% in 2011, lowering the US population percentage residing in opioid treatment shortage counties to approximately 10%. The increase in buprenorphine-waived physicians has dramatically increased potential access to opioid agonist treatment, especially in non-metropolitan counties.

Introduction

Opioid use disorders (1) are a significant public health problem, affecting an estimated 2 million individuals in the United States in 2012.(2) Illicit opioid use contributes to medical morbidity, promotes risky behaviors, and complicates treatment for medical and mental health conditions.(3–5) In 2009, the annual societal costs of heroin and prescription opioid

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misuse, including overdose deaths, lost productivity, criminal justice costs, and individual health care costs, totaled an estimated \$55.7 billion.(6, 7)

Opioid use disorders are chronic medical illnesses requiring treatment.(8) Opioid agonist therapy provided in structured and licensed addiction programs or in physician offices comprises evidence-based, cost-effective treatments that mitigate the negative health and societal effects of the disorders. Such therapies are more effective than counseling alone,(9–11) but historically the majority of individuals with opioid use disorders have not received opioid agonist treatment.(12, 13) One important treatment barrier is the geographic distribution of providers: opioid treatment programs, which treat patients with methadone and/or buprenorphine, are located predominantly in urban areas.(14, 15) Opioid treatment programs commonly require patients to take daily medications administered on-site under direct observation, effectively limiting treatment access for rural patients.

The 2002 approval of buprenorphine opioid agonist therapy (hereafter defined as either buprenorphine or buprenorphine/naloxone formulations) was welcomed as an opportunity to increase access to treatment for many individuals.(13, 16) Through the Drug Addiction Treatment Act of 2000, physicians who completed an approved course (hereafter referred to as waived physicians) or board certified in addiction medicine or psychiatry were waived from the special registration requirements in the Controlled Substances Act and were permitted to prescribe medications such as buprenorphine outside of opioid treatment programs. Waivered physicians could expand treatment access to individuals who would not or could not attend opioid treatment programs for geographical, ideological, or practical considerations.(14, 17, 18)

The overall number of physicians waived to prescribe buprenorphine has been increasing, (19, 20) but little is known about such physicians' location and whether their distribution has increased potential access to opioid agonist treatment in non-metropolitan and smaller communities where opioid treatment programs are scarce.(14) Proximity to waived physicians does not guarantee access to opioid agonist treatment, but it is a necessary condition.

Our goal is to describe the growth in the number of waived physicians and the evolution of their geographic distribution over the period 2002–2011. We examine whether the increased number and distribution of waived physicians has enhanced potential access to opioid agonist treatment, particularly in non-metropolitan counties with few or no opioid treatment programs. Because waived physicians can prescribe buprenorphine outside of opioid treatment programs, and because there are relatively few opioid treatment programs in rural areas, we hypothesized that growth in the number of waived physicians would have the greatest impact on potential access to treatment in less populated counties.

Methods

Building on the Health Resources and Services Administration (HRSA) methodology for identifying Health Professional Shortage Areas (HPSA), (21) we developed an approach to identify communities with opioid treatment provider shortages, including counties with

shortages of waived physicians, opioid treatment programs, and overall opioid agonist treatment.

Data

We used location and year of certification of waived physicians from the Buprenorphine Waiver Notification System (2002–2011); yearly information about substance abuse treatment programs providing methadone and/or buprenorphine came from the National Survey of Substance Abuse Treatment Services (2002–2011).(2) We used the Area Resource File to obtain rural-urban continuum codes (2003), population, socio-economic, demographic, and health service supply data (2002–2011). To assess need for treatment, we obtained illicit opioid price information from the Drug Enforcement Agency’s System to Retrieve Information from Drug Evidence (2002–2011) and opioid-related overdose death counts from the National Vital Statistics System (2002–2011). We followed the CDC’s approach and identified opioid-related deaths using ICD-10 underlying cause of death codes (X40–X44, X60–64, X85, or Y10–Y14) and injury and poisoning codes (T40.0–T40.4, T40.6).(22)

Defining Shortage Areas

We identified counties with a shortage of *waived physicians, opioid treatment programs,* and overall opioid agonist treatment, drawing on definitions developed by HRSA.(21) HRSA’s HPSA defines shortage areas as areas in which the number of practitioners per capita is very low (below a specified value) or the number of practitioners per capita is low *and* there is high need in the area. We defined shortage area counties, separately for waived physicians and opioid treatment programs, as those that 1) had no providers of that type; 2) fell in the lowest 10% of that type of provider per capita; or 3) fell in the lowest 20% of that type of provider per capita and were in a county with high treatment need. Need was a function of number of opioid-related overdose deaths, heroin prices, and socioeconomic and demographic characteristics (analytic approach details are available in the online Appendix, section A1).(23) We defined an *opioid treatment shortage county* (hereafter referred to as a *treatment shortage county*) as a county that had both a *waived physician shortage* and an *opioid treatment program shortage*.

Analysis

For each year (2002–2011), we identified the number and proportion of each type of treatment-shortage county, and we estimated the number of individuals and fraction of the U.S. population living in each type. We categorized county urban-rural status as metropolitan (urban population >50,000), large non-metropolitan (population >20,000), medium non-metropolitan (population <20,000 and >2,500), and small non-metropolitan (population <2,500).(24) For each urban-rural category, we calculated the means of shortage indicators and the percent of the populations residing in shortage areas for each year. Using *t* and *F*-statistics we tested the hypotheses that (1) the fraction of shortage counties declined during the period across all counties and within each of the urban-rural population classifications, (2) the reduction in shortage counties differed across the urban-rural population classifications, and (3) the percent of population living in shortage counties

declined the least in metropolitan counties and the most in rural counties with relatively large populations. These reductions were associated with commensurate increases in potential access for county residents.

To examine the robustness of our results, we repeated the analyses using two alternative definitions of shortage areas: a) a narrow metric limiting shortage to counties with no providers and b) a broad metric expanding shortage by relaxing the classification criteria to increase the number of high need counties (for details see Appendix Section A1).(23) We found no substantive differences in any result; therefore we present only the results using the shortage area definition most consistent with HRSA methodology. The Institutional Review Boards of the RAND Corporation, the University of Pittsburgh, and Pennsylvania State University approved the study.

Limitations

Study limitations include the following. Not all waived physicians actively treat patients with buprenorphine,(18, 25, 26) and we do not know which waived physicians are actively treating patients, or the extent to which the geographical distribution of active waived physicians differs from non-active physicians. As a result, our approach characterizes potential access to treatment, not actual use. However, presence of waived physicians in non-metropolitan counties is significantly associated with greater use of both buprenorphine (27) and opioid agonist therapy among Medicaid-enrollees.(28) Our data are only available through 2011; we do not know if more recent data would change our findings. Office-based buprenorphine prescribers are restricted to prescribing for either 30 or 100 patients. This restriction may limit the ability of waived physicians to address an unmet need for opioid agonist treatment; thus we may be underestimating the number of counties with a true shortage of opioid agonist treatment. Not all individuals living in a shortage county may have substantial difficulties accessing opioid agonist treatment, since some can access treatment in another county. Our data contain no information about the appropriateness or quality of opioid agonist treatment provided, or the use of non-pharmacologic interventions, both of which may influence clinical outcomes.

Results

Counties with a shortage of opioid treatment programs, waived physicians, and overall opioid agonist treatment

The percentage of counties with a shortage of opioid treatment programs changed only slightly over time ($P<0.001$), trending from 90% in 2002 to approximately 87% in 2011. (Exhibit 1; online Appendix Figure A4)(23) In contrast, the percentage of counties with a shortage of waived physicians fell sharply from 99% in 2002 to 47% in 2011 ($P<0.001$), substantially increasing the number of counties that were no longer treatment shortage counties and in which individuals had potential access to opioid agonist treatment.

In 2002, slightly less than half of the U.S. population resided in treatment shortage counties (Exhibit 2), and the percentage of the population living in counties with a shortage of opioid treatment programs fell only modestly between 2002 and 2011. However, the substantial

decrease in counties with a shortage of waived physicians meant that by 2011, the percentage of the population residing in a treatment shortage county had declined from 49% to 10%, providing an estimated 74% increase in the fraction of the U.S. population with potential access to treatment.

Shortage Counties by Metropolitan Status and Size of County Population

From 2002 to 2011, the percentage of treatment shortage counties declined substantially among both metropolitan and non-metropolitan counties, resulting in increased access to potential treatment in every urban-rural classification ($P<0.001$). (Exhibit 1, Appendix Exhibit A5)(23) Among the urban-rural classifications, the decline (94% to 30%, $P<0.001$), and associated increase in potential access, was greatest among large non-metropolitan counties; the next greatest decline (73% to 24%, $P<0.001$) and associated increased potential access occurred in metropolitan counties. The declines in these two types of counties were significantly different from one another ($P<0.001$) and significantly greater ($P<0.001$ in each case) than the decline in either medium non-metropolitan counties (98% to 54%, $P<0.001$) or small non-metropolitan counties (99% to 76%, $P<0.001$). Thus potential access increased less in these latter types of counties.

Counties of each urban-rural classification had statistically significant and substantial declines from 2002 to 2011 in the percentage of population living in treatment shortage counties ($P<0.001$ for each urban-rural classification) (Exhibit 3), with smaller but substantial declines in the most densely and least densely populated counties. By 2011, only 5% of metropolitan residents lived in a treatment shortage county (down from nearly 39% in 2002) and just over 60% of small non-metropolitan county residents lived in a treatment shortage county (down from nearly 100% in 2002).

Online Appendix Exhibit A5 (23), a map of the United States, illustrates that although potential access to opioid agonist therapy improved substantially from 2002 and 2011, particularly on the East and West coasts, large areas in the Midwest were still designated as shortages areas in 2011.

Discussion

We found that buprenorphine treatment has significantly decreased the number of counties and the percent of the U.S. population living in counties that have potential shortages of access to opioid agonist therapy, substantially increasing potential access to opioid agonist therapy for millions of Americans. Improved access to such treatment may be particularly important and timely: rising rates of heroin use and a surge in prescription opioid misuse have intensified the need for treatment of opioid dependence.(6, 29–31)

Consistent with studies of treatment access in other areas of healthcare,(32) we find that shortages of qualified opioid agonist treatment providers remain more problematic in less populated counties than in metropolitan counties, despite the fact that the less populated counties had the greatest increase in opioid agonist treatment providers between 2002 and 2011. The potential impact of buprenorphine waived physicians in non-metropolitan counties may be large relative to that of new opioid treatment programs in these areas

because the additional clinical infrastructure required by a physician to provide office-based buprenorphine is minimal compared to that required to establish a new opioid treatment program.

Policy Implications

With fewer than 3.5% of office-based U.S. physicians waived to prescribe buprenorphine, potential access to buprenorphine has not diffused as widely as hoped when it was first introduced,(16, 25, 26, 33), and obtaining opioid agonist treatment remains challenging in large swathes of the country. Many of these areas are in the Midwest, a region of the country in which Medicaid policies facilitating access to opioid agonist therapy have historically been less generous than in other regions of the country, and where there have been fewer policy changes in recent years to enhance such access.(34)

It also remains to be seen to what extent Medicaid expansion and other changes following passage of the Affordable Care Act (ACA) influences the availability of opioid agonist therapy for Medicaid enrollees in the future.(35) The government is already the largest payer for substance abuse treatment services, (36, 37) and given the increased number of Medicaid enrollees in many states and Medicaid enrollees' higher rates of opioid use disorders,(38) the potential for increased demand for opioid use disorder treatment is quite high. Parity of behavioral health services under the ACA may also affect the availability of opioid agonist treatment, given that prior Federal parity legislation (39) was associated with an increase in substance abuse treatment facilities use of buprenorphine (40) but not broader substance use disorder treatment expansion.(41)

It is unlikely that the number of opioid treatment programs dispensing methadone will substantially increase, given the regulatory burden involved in opening and running such programs,(18, 42–44) and many communities' unwillingness to accept a nearby opioid treatment program.(18) It is therefore likely that improved access will occur primarily through office-based physician treatment.(14, 45) To increase the number of buprenorphine waived physicians, federal agencies and professional organizations are increasing the availability of trainings to certify physicians (46–48) and mentorship and support for waived physicians.(49) In addition, states can implement policies that appear to increase the number of waived physicians.(20) In addition to these activities, policymakers seeking to increase access should consider other strategies, with an emphasis on increasing the number of waived physicians in non-metropolitan counties. These could include increasing the number of and support for physicians in shortage areas (49) and further relaxing limits on the number of individuals each waived physician can treat.(50) Such policies could potentially substantially increase the use of buprenorphine, particularly in rural communities,(27) which may be particularly relevant and timely, given buprenorphine's effectiveness in treating dependence on prescription opioids,(51) a growing problem in many smaller counties.(6)

However, the lack of supportive infrastructure may also present challenges to office-based waived physicians (52) with respect to adequately monitoring appropriate buprenorphine use, as well as being challenged to meet the waiver's requirement of being able to refer buprenorphine patients for appropriate counseling and other non-pharmacologic therapies.

(53) Further research is needed to better understand to what extent quality of care and clinical outcomes vary across different settings in which individuals with opioid use disorders receive opioid agonist treatment.

Conclusion

Expansion of buprenorphine-waivered physicians throughout the country, particularly in rural areas, has dramatically expanded the geographic distribution of qualified providers, increasing potential access to opioid agonist treatment. Given our findings, policies that increase the number of waivered physicians and expand the number of patients who can be treated by each waivered physician, may be the most rapid approach to enhancing capacity for opioid agonist treatment, particularly outside of metropolitan counties.

However, increasing the supply of providers able to treat patients addresses only one of the challenges to expanding potential access to effective treatment for opioid use disorders. A range of other important barriers exist for many individuals, including stigma,(54, 55) inadequate insurance coverage,(56) onerous treatment requirements,(57, 58) and inadequate training for waivered physicians regarding the mental and physical health disorders commonly comorbid with opioid misuse.(59, 60) Future efforts are needed to better understand and address these additional barriers, as reducing the number of areas that have a shortage of providers able to treat with opioid agonist therapy is an essential step in addressing this substantial public health problem.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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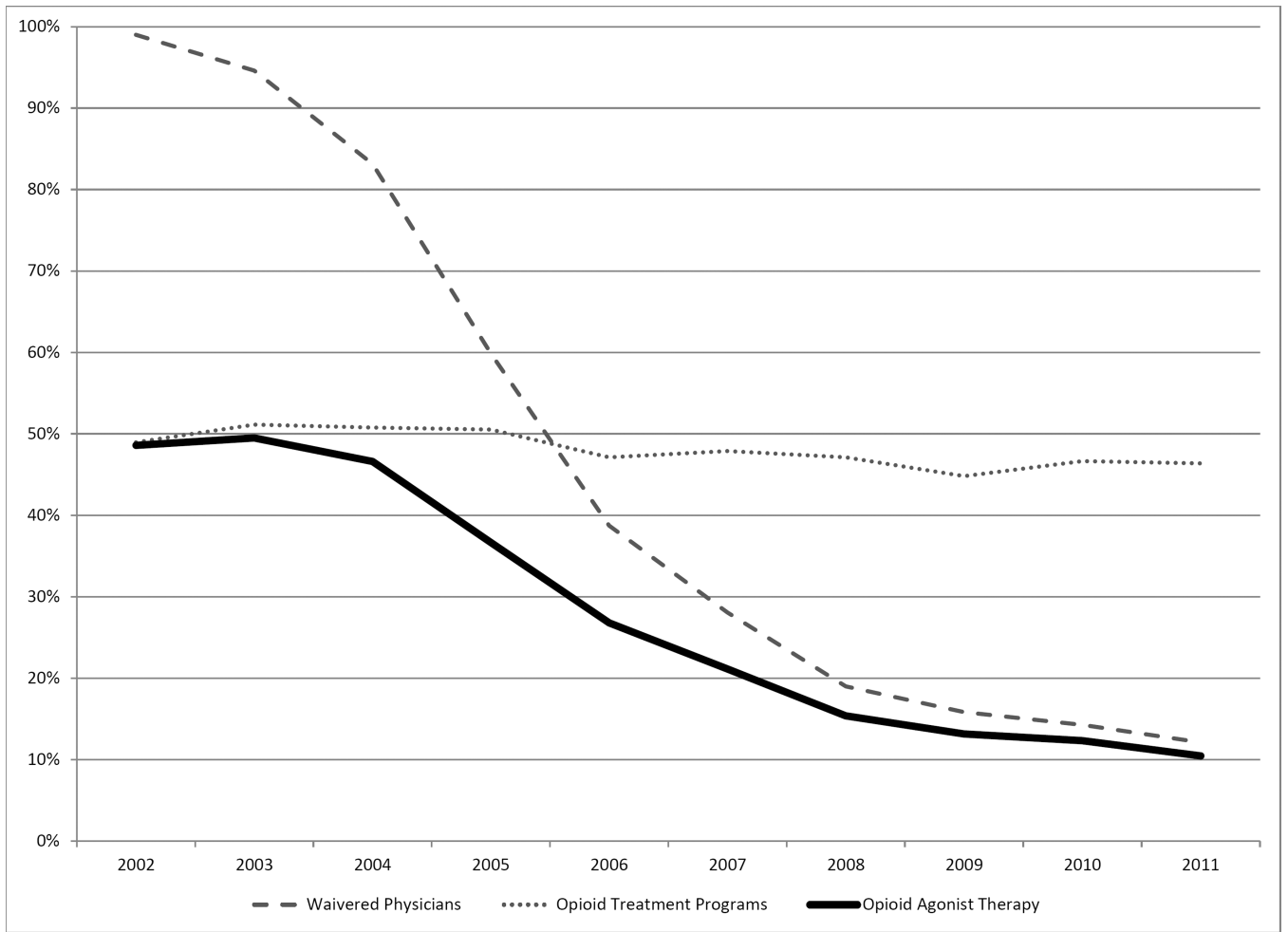


EXHIBIT 2.
Percent of Population Living in Counties with Opioid Treatment Program, Waivered Physician, and Opioid Agonist Treatment Shortages Source: Authors' analysis

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	Metro	Non Metro	Non Metro	Non Metro, Pop. < 2.5K
2002	0.3899	0.922	0.9721	0.991
2003	0.4098	0.8773	0.9306	0.9502
2004	0.3869	0.8198	0.8735	0.9013
2005	0.2851	0.7195	0.7967	0.8418
2006	0.183	0.6309	0.7175	0.8024
2007	0.1378	0.4892	0.624	0.7516
2008	0.0891	0.3726	0.5342	0.6676
2009	0.071	0.3196	0.5024	0.6486
2010	0.0665	0.2822	0.4749	0.6281
2011	0.0515	0.2403	0.4412	0.6145

EXHIBIT 3.

Percent of Population Living in Opioid Agonist Treatment Shortage Counties by Population and Urban Status Source: Authors' analysis

Exhibit 1

The Change in Opioid Agonist Treatment Shortage Counties between 2002 and 2011 Source: Authors' analysis

	2002	2011
	% of shortage counties	% of shortage counties
Overall		
Opioid Treatment Program	90.3	87.0****
Waivered Physicians	98.9	46.8****
Overall Opioid Agonist Therapy	86.9	45.8****
Metro		
Opioid Treatment Program	74.6	68.6***
Waivered Physicians	98.6	26.1****
Overall Opioid Agonist Therapy	73.3	24.1****
Large non -Metro		
Opioid Treatment Program	95.0	88.6***
Waivered Physicians	99.1	31.3****
Overall Opioid Agonist Therapy	94.4	29.7****
Medium non -Metro		
Opioid Treatment Program	99.0	97.7**
Waivered Physicians	98.6	54.6****
Overall Opioid Agonist Therapy	97.5	54.1****
Small non -Metro		
Opioid Treatment Program	100	99.4
Waivered Physicians	99.6	75.9****
Overall Opioid Agonist Therapy	99.6	75.7****

Difference between 2002–2011: * p< 0.1;

** p< 0.05;

*** p< 0.01;

**** p < 0.001