



**U.S. Department of Health and Human Services
Assistant Secretary for Planning and Evaluation
Office of Disability, Aging and Long-Term Care Policy**

INPATIENT BED TRACKING: STATE RESPONSES TO NEED FOR INPATIENT CARE

August 2019

Office of the Assistant Secretary for Planning and Evaluation

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This report was prepared under contract #HHSP233201600021I between HHS's ASPE/DALTCP and Research Triangle Institute. For additional information about this subject, you can visit the DALTCP home page at <https://aspe.hhs.gov/office-disability-aging-and-long-term-care-policy-daltcp> or contact the ASPE Project Officers, Helen Lamont and Laurel Fuller, at HHS/ASPE/DALTCP, Room 424E, H.H. Humphrey Building, 200 Independence Avenue, S.W., Washington, D.C. 20201; Helen.Lamont@hhs.gov.

The opinions and views expressed in this report are those of the authors. They do not reflect the views of the Department of Health and Human Services, the contractor or any other funding organization. This report was completed and submitted on September 21, 2018.

August 2019

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Final Report

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ACRONYMS

The following acronyms are mentioned in this report and/or appendices.

ASPE	HHS Office of the Assistant Secretary for Planning and Evaluation
CEO	Chief Executive Officer
DMHAS	Connecticut Department of Mental Health and Addiction Services
EHR	Electronic Health Record
EMS	Emergency Medical Services
EMTALA	Emergency Medical Treatment and Labor Act of 1986
HHS	U.S. Department of Health and Human Services
MRI	Magnetic Resonance Imaging
NRI	National Association of State Mental Health Program Directors Research Institute
ODD	Opioid Use Disorder
RTI	Research Triangle Institute
SAMHSA	HHS Substance Abuse and Mental Health Services Administration
SUD	Substance Use Disorder

EXECUTIVE SUMMARY

Inpatient hospital and residential mental health and substance use disorder (SUD) treatment settings are a critical component of the behavioral health services care continuum. Patients may require an inpatient hospital stay when they experience a psychiatric or SUD emergency, pose a threat to themselves or others, and need 24-hour medical monitoring and treatment. Residential mental health and SUD settings are less medically intensive. They typically are used as a safe therapeutic environment for patients who have limitations in their ability to carry out basic functions of daily living or are at high risk of relapse in the community. The challenges that patients and their providers face in identifying an open inpatient hospital or residential bed when needed has been well documented--this inability to find available beds leads to long waits in emergency departments and can result in adverse events.

States have begun to collect and post information on bed availability (i.e., create bed registries or bed tracking systems) as a tool for providers, patients, and caregivers to identify open beds more efficiently. In the absence of a bed registry, emergency room staff, patients, or other providers must call multiple hospitals or residential settings to determine if there is a slot available that would be appropriate given the patient's needs.

Little is known about states bed registries, their effectiveness, and challenges faced in their execution and utilization. The U.S. Department of Health and Human Services Office of the Assistant Secretary for Planning and Evaluation contracted with RTI to study whether states were making information on open beds available to consumers, the impact of effect that inpatient bed tracking had on patient access, and the challenges that remain with inpatient bed tracking systems. To collect this information, RTI conducted an environmental scan and 13 interviews with 18 stakeholders in five states.

We began the environmental scan by identifying states that have systems to track openings in behavioral health treatment settings, such as hospital psychiatric beds and residential treatment beds. We found 17 states that tracked this information; of these, five allowed public access. The other 12 states kept the information about bed availability behind a firewall and only available to providers.

Through the environmental scan and discussions with stakeholders, we found significant variation among states in how the registries were operating, the types of behavioral health providers they included, and perceptions of their usefulness. In some states, systems to track the availability of psychiatric hospital beds have been challenged by the reluctance of hospitals to update information on open beds frequently enough to be useful given rapid patient turnover. Emergency department staff noted that the system does not negate the need for them to call hospitals to confirm that there is still an open bed that is appropriate for the patient's needs and that relationships among hospitals and emergency departments and other crisis system staff may be more efficient than using the bed registries. However, some states reported that the registries were very helpful in locating open beds as well as in documenting the need for additional psychiatric beds.

Registries that post available openings in SUD residential, detoxification, and other non-hospital-based systems are less common than hospital bed registries. Connecticut has a publicly-facing registry that indicates openings in SUD treatment settings. Interviewees reported that patients with SUDs and providers like the system and find it useful. However, it was noted that more effort is needed to make patients and family members aware of the system. Interviewees also thought the system should add information on openings in outpatient SUD treatment settings and providers who can prescribe medications to treat SUD, such as buprenorphine or naltrexone.

There have been no formal evaluations of the effect of bed registries on access to care. Future research could help improve understanding of the characteristics and processes that make the bed registries most useful. Some avenues to explore include: (1) how financial, regulatory, contractual, and policy levers can be used to encourage participation in bed registry systems; (2) how many consumers are using the public registries and how to increase their usage; (3) whether technology can substitute for human data entry to track available treatment beds; and (4) whether registries reduce the time and effort required to locate an appropriate inpatient or residential bed.

1. BACKGROUND

Opioid-related overdose is now the leading cause of unintentional deaths in the United States--nearly 120 people die each day from an opioid-related overdose (HHS, 2018; Storholm et al., 2017). Close to 2.5 million people struggle with an opioid use disorder (OUD) and 11.5 million people misuse prescription opioids. Consequently, trends in emergency department visits appear to have also increased among people for suspected opioid overdoses, with more than 142,000 emergency department visits between July 2016 and September 2017 (Vivolo-Kantor et al., 2018).

More generally, in recent years there has been increased use in emergency department visits for both mental health issues and substance use disorder (SUD) diagnoses (Morse & Bride, 2005; Croake et al., 2017). Providing appropriate treatment that is tailored to the unique needs of patients with OUD, SUD, mental health disorders, or co-occurring substance use and mental health disorder has been shown to improve outcomes and reduce financial burden (Gilbody, Bower, Fletcher, Richards, & Sutton, 2016).

The behavioral health treatment system comprises a wide array of treatment modalities, treatment settings, and professional types designed to meet diverse individual treatment needs and preferences. Different treatment settings are sometimes characterized as “levels of care,” which range from the least intensive and expensive, such as treatment delivered in outpatient clinics or clinicians’ offices, to relatively more intensive outpatient services that patient attend for longer period of time and more frequently, such as intensive outpatient/partial hospitalization, to 24-hour residential services and then to inpatient hospital services, which are typically the most expensive level of care (Sharfstein, & Dickerson, 2009).

The availability of the full continuum of levels of care within behavioral health systems is important for ensuring that patients are safe and achieve optimal clinical outcomes. For example, individuals who are experiencing acute psychotic symptoms with suicidal or homicidal ideation, or who are experiencing a drug overdose, typically require intensive medical monitoring and treatment that can be only delivered in hospitals staffed with medical personnel and equipped with the appropriate types of medical interventions and professionals, such as psychiatric nurses, MRIs, and 24-hour monitoring. Once the acute episode has stabilized, it is expected that individuals will step down to less intensive settings, such as outpatient settings, allowing them to begin to return to normal activities (e.g., work, school, social relations) (American Society of Addiction Medicine, 2018).

Patients experiencing a psychiatric emergency often present at hospital emergency departments or crisis centers where they receive psychiatric and medical assessments to determine the most appropriate treatment setting. If it is determined that the patient requires an inpatient psychiatric admission, and the hospital does not already have a psychiatric unit, an open bed at another facility must be located so that the patient can be transferred to that facility. Historically, emergency department staff would find a hospital bed by calling hospitals until an appropriate opening was found. As psychiatric hospital bed supply has declined over the years,

finding an open bed has become more difficult, which has led to longer wait times in emergency departments (Gold, 2016; American Hospital Association, 2007).

More generally, providing information on openings in mental health and SUD treatment programs could be helpful to patients, their families, and providers who are seeking treatment. For example, according to the U.S. Department of Health and Human Services (HHS) Substance Abuse and Mental Health Services Administration (SAMHSA) National Survey on Drug Use and Health, one in five adults who felt a need for treatment but did not receive treatment did not know where to go to receive it (Park-Lee, Lipari, Hedden, Kroutil, & Porter, 2017).

To address the need for timely and accurate information of inpatient bed availability, and mental health and SUD treatment provider availability more generally, some states are collecting and publishing information on bed availability (i.e., creating “bed registries,” “bed tracking systems,” or “bed boards”) as a tool for providers and patients to identify open beds more efficiently.

However, little is known about the types of inpatient bed trackers available or their potential to support access to behavioral health treatment generally, and SUD and OUD treatment more specifically. The HHS Office of the Assistant Secretary for Planning and Evaluation (ASPE) contracted with RTI International to help fill this research gap by focusing on the following research questions:

- How have states decided to share inpatient bed information with consumers?
 - Why did the state decide to make this information available? What infrastructure changes were needed to do this?
 - How are they tracking availability? What tools are being used to share that information?
- What impact has inpatient bed tracking had on patient access?
 - How have the experiences of local providers changed? Have these tools addressed the needs of patient advocates?
- What challenges remain within existing inpatient bed tracking systems? How could these issues be addressed?

2. METHODS

This section describes the methods the RTI team employed to conduct an environmental scan and interviews with inpatient bed registry stakeholders to assess the sharing of inpatient bed information with consumers, the impact of inpatient bed tracking efforts, and the challenges that remain within existing inpatient bed tracking systems.

2.1. Environmental Scan

We began this study by conducting an environmental scan guided by a formal protocol exploring the published and grey literature.

Published and Grey Literature Review. To identify relevant literature, we developed a list of keywords focused around “psychiatric bed registry,” “substance abuse registry,” and “addiction bed registry.” *Exhibit 1* summarizes the mesh terms utilized to search for relevant literature.

EXHIBIT 1. Environmental Scan MeSH Terms					
Type of Tx		Tracking		Setting	
– mental	– drug	– availab*	– slot	– hospital	– outpatient
– substance	– abuse	– bed	– open*	– resident*	
– opiate	– behavioral	– treat*	– track*		
– opioid					

We worked with RTI’s librarians to identify appropriate search engines and to refine suggested search terms. We tailored search strategies for PubMed, Science Direct, PsycINFO, International Pharmaceutical Abstracts, JSTOR, and Web of Science based on the developed search terms. Only articles published in English between January 1, 2008, and August 1, 2018, were included in this study. The abstracts identified by these searches were imported into an EndNote database and screened for duplicates. The remaining abstracts were imported into a Microsoft Excel database for use by the research team. Two members of the research team reviewed the identified articles based on our research questions, independently extracted data from the abstracts of all publications, and determined a publication’s appropriateness for inclusion in the full review, including year of publication, publication type, population of focus, study methods, and overall relevancy. All articles determined appropriate for inclusion were assigned to a team member for more thorough review focused on applicability to the research questions as well as practice or policy implications.

Concurrently, a team member conducted an additional search of the grey literature. Major organizations were identified that help extend the education and support of mental health and SUD services, including the National Alliance on Mental Illness, National Association of State Mental Health Program Directors, and Facing Addiction. The key search terms were used to identify relevant resources from each organization’s website. A further search of governmental websites was also completed using the key search terms. All resources identified from the search of the grey literature were included in an Excel database.

State Bed Tracking System Review. The RTI team conducted a detailed review of the status of inpatient bed tracking in each of the 50 states and the District of Columbia. We determined whether each was currently using informational trackers or other means of communicating current inpatient bed availability.

Assessment of Public Access. To answer the first research question--how have states decided to share inpatient bed information with consumers--we conducted a Google search for information consumers may be able to easily find on inpatient bed availability. If a state had an externally-facing, accessible system to track inpatient beds, we abstracted further information on the specific system into a database. This included information on the types of inpatient beds, categories of individuals granted access to the system, and direct links to the systems themselves. Though the environmental scan broadly covered the availability of inpatient beds for all behavioral health conditions, special consideration was given to identifying systems specifically addressing bed availability for OUD and severe mental illness, and these characteristics were also documented as part of the abstraction.

Findings from the environmental scan informed the selection of states from which to recruit stakeholder interview participants. Based on the criteria listed in **Exhibit 2**, we identified Connecticut, Iowa, Kansas, Massachusetts, and Virginia as key states that could provide insight into the various methods and challenges of implementing a psychiatric and/or SUD bed registry, and into the impact the registries have had for providers and consumers.

EXHIBIT 2. State Selection Criteria	
<ul style="list-style-type: none"> – Advanced systems for tracking available – Stakeholders hosting or utilizing the bed registries – Bed registries made available to consumers vs. providers, and the implications of the differences in externally-facing bed registries vs. those in-house 	<ul style="list-style-type: none"> – Long-term care and psychiatric use – Relationship to opioid crisis (outpatient medication-assisted therapy mismatch with inpatient tracking)

2.2. Discussions with Stakeholders

RTI conducted semi-structured, key informant interviews to learn from stakeholders how the registries function, their perceived impact, and challenges encountered. RTI identified two to three key informants per study state. RTI submitted a list of all potential key informants to ASPE for review. We sent a brief introduction email (see **Appendix A**) to potential participants that included a brief description of the study and asked potential participants to confirm that they were either: (1) a representative from a state department or agency responsible for implementing or overseeing the inpatient bed registry; (2) a community behavioral health provider that may use the registry to find beds for clients; (3) a hospital that submits information on open behavioral health beds; or (4) a patient advocacy group that represents consumers and their families who may use the bed registry system. The email also asked if they would be willing to participate in a scheduled telephone interview with an RTI team member. We aimed to purposefully select stakeholders from a variety of organizations to ensure representation from all entities. Seventy-

four participants were contacted for interviews. We conducted 13 interviews with 18 participants representing 13 organizations.

Those who agreed to participate in the study were scheduled for a 30-minute or 60-minute interview. Research questions identified in Task 2 helped inform the semi-structured interview guide. Questions about implementation and evaluation of the bed registries were crafted to gather details on frequency of updating, details on the behavioral health settings, type of staff who utilize the platforms, feedback from providers and laypersons, stakeholders involved in development, operational challenges along the way, legislation limitations, and any suggestions or scheduled changes states will be making in the future.

There was no compensation for participant time. Interviewers followed each interview with a courtesy thank-you email that included contact information. All interviews were loosely transcribed by a team member to begin qualitative analysis. Interview notes were analyzed for the themes listed in *Exhibit 3*.

EXHIBIT 3. Qualitative Analysis Themes	
<ul style="list-style-type: none"> – Behavioral health settings in the bed registry – Intended users of the bed registry – Information about available beds/capacity included in the registry – Frequency of updating the bed registry, mandates, incentives to submit 	<ul style="list-style-type: none"> – Frequency and types of providers contributing to the system – Challenges and successes of the bed registries, including user perception – Behavioral health settings in the bed registry

3. RESULTS

3.1. How Many States Have Bed Registry Systems and How Many Share Information with Consumers?

In 2017, the National Association of State Mental Health Program Directors Research Institute (NRI) conducted a survey of all 50 states, the District of Columbia, and six territories on status of psychiatric inpatient bed tracking systems (Park-Lee et al., 2017). They found that 16 states had psychiatric inpatient bed tracking and eight were developing systems. The most common types of beds tracked were state psychiatric beds (13 states), general hospital psychiatric beds (13 states), and private psychiatric beds (12 states). Of the 16 states with current psychiatric inpatient bed tracking systems, five indicated they also tracked substance use residential beds and four indicated they tracked substance use crisis beds. Of the 16 states, nine reported that participation in the bed registry was voluntary.

Exhibit 4 summarizes the results of RTI’s state-based tracking review, combined with results previously reported by NRI. We identified 17 states with bed tracking systems, of which five states provided direct public access to bed tracking information: Alaska, Connecticut, Kansas, Massachusetts, and Tennessee. Whereas Connecticut focused only on substance use treatment inpatient bed tracking, Alaska, Kansas, Massachusetts, and Tennessee had systems that addressed both facility types.

EXHIBIT 4. States with Behavioral Health Bed Registries and Whether Information is Shared with Consumers		
States	Types of Beds	Open to Public
Alaska	Psychiatric inpatient, crisis, emergency department residential care for children and youth.	Yes ¹
Connecticut	SUD facilities (detox, residential recovery house). Public and private psychiatric bed tracking system (implemented in April 2018).	Yes ² No ³
Georgia	Private psychiatric beds whose care is funded by the state.	No ^b
Iowa	Inpatient psychiatric services.	No ⁴
Kansas	Inpatient psychiatric beds, “sobering beds”, crisis stabilization beds, social detox, children’s residential crisis, intermediate SUD.	Yes ⁵
Massachusetts	Youth and family services, mental health services, SUD services.	Yes ^{a,6}
Minnesota	Mental health beds and community-based mental health services.	No ⁷
Missouri	Psychiatric beds.	No ⁸
Nevada ^c		
North Carolina	Community hospital psychiatric inpatient units, private psychiatric hospitals, state psychiatric hospitals, state alcohol and drug abuse treatment centers, facility-based crisis centers, non-hospital medical detoxification facilities.	No ⁹
Oklahoma ^c		No ¹⁰
Pennsylvania	Licensed non-hospital detox and inpatient residential SUD treatment provider.	No ¹¹
Tennessee	Psychiatric beds, drug and alcohol beds.	Yes ¹²

EXHIBIT 4. (continued)		
States	Types of Beds	Open to Public
Vermont	Adult Inpatient, Crisis, SUD Recovery, Intensive Residential, and Residential beds as well as Children's Inpatient and Crisis beds	No ¹³
Virginia	State operated mental health hospitals. All privately operated inpatient psych units. Residential crisis stabilization programs.	No ¹⁴
Washington ^c		
Wisconsin	Inpatient psychiatric beds	No ¹⁵
<p>NOTES:</p> <p>a. Information on some 24-hour services is not publicly available.</p> <p>b. Georgia's system does not post openings to an online portal or website, instead the information is only available to crisis call line staff can see all facilities, down to the individual bed level. Providers call the crisis line to find availability.</p> <p>c. Denotes divergence with the 2017 NRI report, RTI could not locate an externally-face website housing a bed registry. https://www.nri-inc.org/media/1359/psychiatric-bed-registries-report-2017.pdf.</p> <p>1. See http://bedcount.dhss.alaska.gov/BedCount/statewide.aspx?ProgramType=PICE.</p> <p>2. See http://www.ctaddictionservices.com/.</p> <p>3. See http://www.ctbhp.com/providers/bulletins/2018/PB2018-03-ii.pdf.</p> <p>4. See https://iowa.carematchweb.com/csp/idhs/scrlogon.csp.</p> <p>5. See http://bedcount.kansashealthsolutions.org.</p> <p>6. See https://www.mabhaccess.com.</p> <p>7. See https://www.mnmhaccess.com/.</p> <p>8. See https://web.mhanet.com/emresource.aspx.</p> <p>9. See https://www.ncdhhs.gov/bh-crsys.</p> <p>10. See https://www.ok.gov/health2/documents/TRAU_EMR-ResourceListcollapsed.pdf.</p> <p>11. See https://www.ddap.pa.gov/treatment/Pages/Open-Beds.aspx.</p> <p>12. See https://healthwebaccess.tn.gov/idashboards/html5/?guestuser=guest&dashID=425&c=0.</p> <p>13. See https://bedboard.vermont.gov/.</p> <p>14. See https://vabedregistry.turanto.com/login?returnUrl=%2Fhome.</p> <p>15. See http://bedlocator.whainfocenter.com/.</p>		

How Do Registries Make Information Available to Consumers? The five states that made bed registry information available online to the public did so through an open access website. Some interviewees thought that states should take greater efforts to make the availability of the website and the information on openings more widely known. For example, interviewees suggested that state agencies partner with patient advocacy groups who could link to the website to further disseminate the information. State agencies could also disseminate the information through a marketing campaign, as they have done with other initiatives related to the opioid epidemic.

3.1.1. Why Did the State Decide to Make Information Available to Consumers?

The Connecticut Department of Mental Health and Addiction Services (DMHAS) established a SUD registry after holding opioid forums around the state and hearing from the public that they wanted information on the availability of detoxification and SUD residential treatment beds. Interview participants familiar with Connecticut's registry noted that even though they educated the public that medications were the first-line and most effective treatment for OUD treatments, the public still wanted information about the availability of residential SUD treatment beds. However, some state agencies representatives interviewed across the five states

believed that providing information on psychiatric hospital bed openings to the public would not be helpful.

3.1.2. How Do Registries Track Available Beds?

Technology Supporting Bed Registries. The basic functioning of all existing bed registries is the same: Providers are asked to enter information on bed availability on a routine basis into a web-based database that then posts the information on a website that is either open to the public or behind a firewall available to users with a login. For example, in Virginia, users log into a cloud-based system from any computer using a login. Massachusetts developed their bed registry using open-source software used in Minnesota's bed registry.

NRI concluded that no state currently has a registry linked to Electronic Health Records (EHR) or hospital admission/discharge data systems to automatically update bed availability. Virginia reported that they have had conversations about linking to an EHR, however there is challenge with interoperability.

Staff Entering Data. Typically, providers select a staff member within the organization to be responsible for entering information on bed availability into the web-based portal. The type of staff doing the data entry varies widely. In a general hospital, it might range from an administrative professional to a charge nurse covering the night-time shift. In psychiatric hospitals, utilization managers, case managers, or social works may be responsible for updating bed availability.

Frequency of Updates. The suggested or required frequency of updates ranged from once a day to three times a day. Providers update the information on open beds on the Connecticut psychiatric hospital bed registry at least twice daily. Connecticut's residential SUD bed registry is expected to be updated daily, and detoxification and recovery programs are expected to be updated once in the morning and then again in the afternoon, because they turn over more quickly than residential beds. In Virginia, by law, hospitals must update the registry every time there is bed availability and no less frequently than once a day. Iowa requires hospitals with psychiatric units to update the inpatient psychiatric bed system at least two times per day with the available number of staffed beds by gender for child, adult, and geriatric patients. Massachusetts requires that hospitals update three times a day and includes this requirement in their Medicaid managed care performance contracts.

Cost of Implementing Bed Registries. Participants familiar with Tennessee's registry system reported that it took about 16 hours of programming time to set up its registry using open-source software. It costs about \$60,000 each year to maintain the system, which is a fixed cost for the entire system including all bed types. The funding for the registry came from the HHS Office of the Assistant Secretary for Preparedness and Response Hospital Preparedness Program.

Virginia funded a partial position to support their bed registry. The Virginia State legislature allocates \$25,000 to the Department of Health every year to maintain the system, however, Virginia interviewees noted that the funding is less than 50% of what is needed.

Iowa's bed registry, which went live in 2015, cost \$150,000 to establish. They are sustaining it with a SAMHSA Mental Health Block Grant.

Connecticut built their SUD bed registry using federal grant dollars from the SAMHSA State Targeted Response to the Opioid Crisis Grants. It cost \$25,000 to establish, and the state pays a small monthly hosting fee.

3.2. What Impact Has Inpatient Bed Tracking Had on Patient Access?

We did not find any formal evaluations of the bed tracking systems. Virginia respondents noted that it was hard to determine the effect of bed tracking because the state had implemented numerous changes to its behavioral health delivery system as part of an 1115 waiver.

Iowa respondents believed that the Iowa registry has helped to improve access, but they noted that their impressions are based on anecdotal evidence and not a formal data analysis. They also noted that the system has allowed the emergency department staff greater leverage to question a hospital when they say there is not a bed available. They reported that they are telling staff that if they make a call, and they get a denial, they should ask more specific questions about the reasons for the denial to determine if it is justified. However, a 2015 newspaper report indicated that the CareMatch database--which allows hospitals to post real-time bed availability so that rural hospitals can find placements for patients having mental health emergencies--was not working as intended because the information was not being updated regularly (Jordan, 2015).

Massachusetts has had a behavioral health tracking system for over 10 years. It originated as a system focused only on Medicaid beneficiaries, but has since expanded to be available to all payers. Interviewees said that providers like the system. Massachusetts hospitals are routinely entering information on open beds and emergency department staff are using the information to locate beds. Interviewees reported that emergency department staff complain when the system is not updated routinely (evidence that they find it useful). Interviewees believe that the bed registry is improving access and helping the state reduce emergency department wait times. They note that although it creates more work in terms of data entry, it provides transparency regarding where openings exist. Furthermore, interviewees noted that the information collected through the bed registry, and other data systems, allowed them to better determine the need for more beds and has contributed hospitals willingness to open five new psychiatric inpatient units in the last couple of years.

Massachusetts hospital bed registry is not open to the public. However, Massachusetts does post information publicly on other (non-24 hour) behavioral health providers throughout the state that is searchable by ZIP code and service type. A consumer representative from Massachusetts thought that this registry was useful to consumers in helping them locate services and knowing ahead of time what the services would "look like." They thought that the availability of information on behavioral health services for children was particularly useful for families.

Connecticut interviewees reported the Connecticut SUD bed registry is helping patients locate beds. In addition to indicating which providers have openings, the fact that the website lists all the providers in the state, and their contact information, on one website helps families and people find services. Patient advocates in Connecticut reported that the Connecticut bed registry was “of great benefit.” They noted that individuals seeking SUD treatment systems are often at a loss for where to look for providers. A search of the web typically yielded links to “predatory, for-profit providers.” In contrast, the Connecticut system listed all of the available SUD residential providers, including for-profit providers, with their phone numbers, in one place. When it first began, the primary users of the website were clients, however, now providers are now using it as well. For example, an outpatient program may use it for a client who needs a detoxification program.

We also heard from consumer representatives the systems being used to track SUD services should be leveraged to identifying gaps in capacity. For example, if there were no open beds for a long period of time, this would indicate a need for expanded capacity. This could be addressed by the state or may be a signal for private providers that they could open more facilities to address the unmet need.

3.3. What Challenges Remain Within Existing Inpatient Bed Tracking Systems? How Could These Issues be Addressed?

Although providing centralized, timely information on open beds seems like a “no brainer” that would benefit providers and patients alike, implementing these systems and realizing their potential benefits has not been without challenges.

Encouraging hospitals to enter data into bed registries is an obstacle to usefulness for hospitals and consumers. In a 2015 journal article, Maryland detailed its experiences in a failed effort to implement a statewide inpatient psychiatric bed tracking system (Triplett, Harrison, Daviss, & Angelino, 2015). Maryland created a web-based system for reporting available psychiatric trauma, intensive care, and general hospital beds in the state. Facilities were expected to update their information on the website a minimum of twice daily. However, participation in the system was voluntary and low.

To understand the reasons for the low participation, the Maryland Hospital Association queried members of the Mental Health Workgroup on their impressions of and experiences with the registry; only seven of the members responded. The respondents noted that training, ease of use, and reliability of the system were good, but they consistently rated the accuracy, timeliness, and overall utility of the registry as “poor” or “very poor.” Respondents also said that the registry did not make finding beds easier, did not reduce time spent in looking for beds, did not improve the clinical match of patients and beds, did not improve emergency department throughput, and did not improve emergency department staff satisfaction. In narrative comments, hospitals indicated that the low participation rate and infrequent updating of information hindered the registry’s utility. Some respondents found the data entry to take minimal time, while others felt that it detracted from clinical time. It also became clear that some hospitals feared that the registry would be used to monitor hospitals’ compliance with the Emergency Medical Treatment

and Labor Act of 1986 (EMTALA), or worse, used as a means to further an agenda of transitioning all inpatient care out of state facilities and into already overburdened community hospitals.

The Maryland Hospital Association and Secretary of the Maryland Department of Health and Mental Hygiene sent a joint letter to hospital CEOs and presidents to encourage greater engagement with upcoming training events and the registry itself. In response to these interventions, participation with the registry expanded temporarily, but then essentially stopped. At a meeting of the Mental Health Workgroup in December 2014, it was noted that only a handful of hospitals continued to use the system, and that those hospitals still found that it did not help in finding beds.

In a 2016 review, the Virginia Office of Inspector General concluded that the state's registry operated in substantial compliance with statutory requirements. However, registry updates were not always being made by providers in accordance with code requirements (Virginia Office of Inspector General, 2016). To improve current processes and enhance future outcomes, the Office of Inspector General recommended that the Department of Behavioral Health develop a system for monitoring providers' procedures for updating the registry whenever a change in bed availability occurred and develop processes for addressing non-compliance. They also recommended that the Department of Behavioral Health analyze the performance of the system and disseminate their findings to hospitals and other providers in the state.

In 2018, NRI conducted semi-structured interviews with representatives from nine states to learn more about the experiences of states in operating psychiatric bed registries. A key finding from those interviews was that encouraging hospitals to provide accurate information about bed availability was a major challenge (NRI, 2017). NRI surmised that hospitals may believe that revealing bed occupancy limits their ability to control which patients are admitted. Interviewees also mentioned concerns about the bed registry overriding their diversion status as a reason for non-participation. A hospital may temporarily go on "diversion status" in which it informs local emergency medical services (EMS) that its beds are full, and it cannot take new patients. Some Hospital Association interviewees noted that hospitals were worried that EMS might see out-of-date information indicating that they had open beds, and might not see that they were on diversion. If they did not have open beds and EMS brought a patient to their facility, they could be in violation of the EMTALA.

Timeliness of information is a barrier. Given the rapid admission and discharge of patients from hospitals, facilities need to update the registry at regular intervals throughout the day and to dedicate specific staff to conduct this task. The environmental scan indicated that users were not finding the bed registry information to be useful because it was often not up-to-date or accurate. For example, a 2014 *Washington Post* article reported that the Virginia psychiatric bed registry was not working as intended because the data were not reported in real-time, therefore providers had to call facilities to confirm that beds were available--even if beds were listed as available on the registry (Shin, 2014). NRI's case studies also revealed that the lack of timeliness of the data was a barrier to its usefulness. An interview participant familiar with the Kansas registry system reported that although emergency department staff logged the availability of beds each morning, the data quickly became out-of-date and the staff did not have

the desire to go back and update it every hour. Connecticut and Virginia interview participants also reported that the SUD provider bed registry sometimes indicated that a bed was available, but when a peer provider would call, the bed would be already filled. Iowa interviewees reported that they sometimes hear from law enforcement that they have taken patients from a psychiatric emergency room across the state to an open psychiatric bed, only for the bed to no longer be open when they arrive.

NRI noted that an automated system could be implemented that did not require manual data entry and which would be timelier, such as one based on EHRs or admission, discharge, and transfer data. However, they questioned whether hospitals would be willing to participate in an automated system.

Information is not available to the wider public in some states, which may limit its usefulness. Consumer representative respondents believed that the information on availability of psychiatric hospital beds and SUD services could be extremely helpful to patients and their families if made publicly available. In states where the information was publicly available, consumers suggested that states make greater efforts to make the public aware of the resource, for example, by partnering with consumer organizations.

Bed registries may not eliminate the need for providers to call to find a bed. Providers reported that even with a state psychiatric bed registry, emergency department clinicians still must call the hospital to determine if the available bed would be appropriate given the patients clinical needs. Some states report that “[t]here are complaints from emergency services worker that it doesn’t get them very far.” Emergency room staff would prefer for the “bed registry to be a portal where the emergency services clinician could say ‘I have a 40-year-old female with these diagnoses and symptoms, and would you be able to accept her?’” However, the state respondent pointed out that although this approach makes sense in theory, it may be used to justify further reductions in acceptance of involuntary admissions. Iowa interviewees similarly report that although the bed registry is a good place to start, it may still prove frustrating to locate a bed for patients with complex needs, such as patients who exhibit violence or aggression, have co-occurring medical conditions, or have autism, intellectual disabilities or dementia. This problem is exacerbated in states with large rural populations and small critical access hospitals that are not equipped to treat complex patients.

Other states reported that emergency staff needed to be trained to use the system rather than continuing with their traditional approaches. One interviewee noted that the registry is like “a large electronic rolodex that is currently updated. If you have a child who is 14, female, you can put in those attributes and it will self-select which hospital has beds available for a 14-year-old female. It saves time in that sense, you don’t have to call all hospitals, just the ones that meet your needs.” However, the interviewee noted that they needed to train staff to take advantage of the new system. “One of the things we are up against is 40 or 50 years of already-established behavior, where the emergency department has somewhere in their nurses’ station, a lovely laminated list where for the last 40 years, when they have a need, they pick up the list and start dialing the phone [number].”

Although a provider that offered peer recovery coaches in Connecticut thought the system was highly valuable, they were not sure that SUD coaches were using the system to find beds for their patients, or whether they had other, more efficient means of finding beds through established relationships with SUD providers. The interviewee noted that establishing relationships between providers was still critical to finding beds for patients. Other interviewees noted that the more collaborative the local community relationships are, the less utility the bed registry.

4. POLICY IMPLICATIONS AND RECOMMENDATIONS FOR NEXT STEPS

Collect empirical evidence on the effect of bed registries. To date, the only information available on the effectiveness of bed registries on access to services is anecdotal. More formal analyses could help to elucidate the value of bed public facing, and non-public facing registries.

Ensure that the public is aware of public registries. States could enhance awareness of the availability of their registries by conducting public relations campaigns and collaborating with patient advocacy organizations. State could utilize web analytics and consumer surveys to evaluate the success of these efforts.

Add more levels of care, including community care--not just hospital beds. Consumers should ideally have access to information on openings across the full continuum of behavioral health services. Among individuals with OUD, information on which providers who can provide OUD medications are accepting new patients could be particularly helpful. Information on openings in outpatient settings could also help hospitals and residential programs find programs to which they can transfer patients when discharged.

Leverage financial, legislative, regulatory, contractual, and policy levers to improve timeliness of data entry on open beds. Some states are using financial incentives to promote timeliness. For example, Connecticut's bed registry, which is being administered by Beacon Health Options, is trying to ensure timely updates by offering an expedited authorization process if a hospital enters information on open beds. Iowa noted that the legislation that created their bed tracking system indicated that providers' Medicaid reimbursement could be impacted if hospitals did not enter the information twice a day (although they described this as a "nuclear option" that would be unlikely to be used, but which sends a message). Massachusetts included timely updates to the bed registry as a performance metric in its Medicaid managed care outcomes.

Some states are monitoring the frequency of data entry and contacting providers who were not complying with the frequency guidelines. For example, Beacon tracks which hospitals are entering information and troubleshoots with hospitals that are not providing timely updates. Similarly, Iowa tracks participation daily, and hospitals that are not adhering to the guidelines for updating information are emailed. If they still are not complying, they receive a phone call. Connecticut's DMHAS monitors their SUD bed registry; if a provider is not updating regularly, Connecticut sends them a reminder.

Assess whether reimbursement amounts influence hospitals' willingness to make available bed capacity known. Hospitals may be reluctant to divulge information regarding available open beds because they lose money on some or all types of psychiatric admissions. Or they may be concerned that they will have to accept patients who they do not believe they are equipped to treat. In contrast, SUD providers in Connecticut viewed the state's bed registry as "free-marketing, that's driving business and selling beds that maybe wouldn't be filled." The

financial incentives underlying providers willingness to participate in the systems needs further investigation.

Allow providers to reserve a bed through the system. Some interviewees felt that to be optimally useful, the bed registry should indicate not only when a bed was available but should also make it possible to reserve the bed. This would prevent the problem of having a bed shown as available, only for a patient show up at the facility and find that it has been taken. Given the complex considerations when trying to find an appropriate bed, it is unclear whether this approach would be feasible. Moreover, it is not clear that hospitals would want to lose control over their admissions.

Evaluate whether adequate treatment capacity exists. Interviewees noted that the registries cannot make up for a lack of capacity. An individual from the Virginia Hospital Association noted that they have member hospitals with patients waiting up to a week for a bed at the state's psychiatric hospital. Registry data could be mined to determine how often beds are available relative to the need. If beds are always noted as full, the state could expand bed capacity, or look at ways to enhance insurance coverage and reimbursement for inpatient treatment to stimulate private providers to enter the market and fill in the demand. The need for inpatient beds might also be relieved in some states by expanding alternative subacute settings (such as mobile crisis) and developing processes (such as psychiatric teleconsulting) to more quickly determine whether a patient really needs to be admitted to an inpatient setting.

5. CONCLUSIONS

Bed tracking systems may help patients, their families, and health care professionals to more easily find mental health and SUD treatment providers with openings to take new patients. To date, the majority of states have developed these systems to be used by health care professionals, rather than families. State policymakers, health care providers, and consumer advocates believe that the systems can be helpful, although they highlight continued challenges to make them most useful. There has been little formal research, evaluation, or published research on these systems. Additional research could identify ways in which these systems can be made more useful to providers and consumers.

REFERENCES

- American Hospital Association (AHA). (2007). *Behavioral health challenges in the general hospital: Practical help for hospital leaders*. <https://www.aha.org/system/files/content/00-10/07bhtask-recommendations.pdf>.
- American Society of Addiction Medicine (ASAM). (2018). *What are the ASAM levels of care?* <https://www.asamcontinuum.org/knowledgebase/what-are-the-asam-levels-of-care/>.
- Clark, R.E., O'Connell, E., & Samnaliev, M. (2010). *Substance Abuse and Healthcare Costs Knowledge Asset*. Available at http://sapr.org/knowledgeassets/knowledge_detail.cfm?KAID=21.
- Croake, S., Brown, J.D., Miller, D., Darter, N., Patel, M.M., Liu, J., & Scholle, S.H. (2017). Follow-up care after emergency department visits for mental and substance use disorders among Medicaid beneficiaries. *Psychiatric Services*, 68(6), 566-572.
- Gilbody, S., Bower, P., Fletcher, J., Richards, D., & Sutton, A.J. (2016). Collaborative care for depression: A cumulative meta-analysis and review of longer-term outcomes. *JAMA Archives of Internal Medicine*, 166, 2314-2321.
- Gold, J. (2016). A dearth of hospital beds for patients in psychiatric crisis. *Kaiser Health News*. <https://khn.org/news/a-dearth-of-hospital-beds-for-patients-in-psychiatric-crisis/>.
- Jordan, E. (2015). Iowa's mental health bed-tracking database “not useful” so far, hospitals say. *The Gazette*. <https://www.thegazette.com/subject/news/government/iowas-mental-health-bed-tracking-database-not-useful-so-far-hospitals-say-20150925>.
- Morse, S., & Bride, B.E. (2005). Reduction in healthcare utilization and costs following residential integrated treatment for co-occurring substance use and mental health disorders. *Journal of Hospital Administration*, 5(6), 53-57.
- National Association of State Mental Health Program Directors Research Institute (NRI). (2017). <https://www.nri-inc.org/media/1359/psychiatric-bed-registries-report-2017.pdf>.
- Park-Lee, E., Lipari, R.N., Hedden, S.L., Kroutil, L.A., & Porter, J.D. (2017). Receipt of services for substance use and mental health issues among adults: Results from the 2016 National Survey on Drug Use and Health. *NSDUH Data Review*. Retrieved from <https://www.samhsa.gov/data>.
- Scharfstein, S., & Dickerson, F. (2009). Hospital psychiatry for the twenty-first century. *Health Affairs*, 28(3), 685-688.

- Shin, A. (2014). Virginia psychiatric-bed registry does not work as intended, lawmakers told. *Washington Post*. https://www.washingtonpost.com/local/virginia-psychiatric-bed-registry-does-not-work-as-intended-lawmakers-told/2014/07/22/1c848cd6-11b9-11e4-98ee-daea85133bc9_story.html?utm_term=.bb5bdb1e1099.
- Storholm E.D., Ober, A.J., Hunter, S.B., Becker, K.M., Iyiewuare, P.O., Pham, C., & Watkins, K.E. (2017). Barriers to integrating the continuum of care for opioid and alcohol use disorders in primary care: A qualitative longitudinal study. *Journal of Substance Abuse Treatment*, 83, 45-54. <https://www.sciencedirect.com/science/article/pii/S0740547217302465?via%3Dihub>.
- Triplett P., Harrison S.D., Daviss S.R., & Angelino, A.F. (2015). Creating a statewide bed tracker and patient registry to communicate bed need and supply in emergency psychiatry: The Maryland experience. *Joint Commission Journal on Quality and Patient Safety*, 41(12):569-74, PubMed PMID: 26567147.
- U.S. Department of Health and Human Services. (2018). *What is the U.S. opioid epidemic?* <https://www.hhs.gov/opioids/about-the-epidemic/index.html>.
- Virginia Office of Inspector General. (2016). *Review of the Virginia acute psychiatric and community services board bed registry*. <https://www.osig.virginia.gov/media/governorvirginiagov/office-of-the-state-inspector-general/pdf/2016-adm-001-annual-report.pdf>.
- Vivolo-Kantor, A.M., Seth, P., Gladden, R.M., Mattson, C.L., Baldwin, G.T., Kite-Powell, A., & Coletta, M.A. (2018). Vital signs: Trends in emergency department visits for suspected opioid overdoses--United States, July 2016-September 2017. *Morbidity and Mortality Weekly Report*, 67, 279-285, doi.org/10.15585/mmwr.mm6709e1. <https://www.cdc.gov/mmwr/volumes/67/wr/mm6709e1.htm>.

APPENDIX A. RECRUITMENT EMAIL

Dear X,

The Office of the Assistant Secretary for Planning and Evaluation (ASPE) of the U.S. Department of Health and Human Services is interested in understanding states' use of behavioral health bed registries to help individuals obtain needed inpatient treatment for substance use disorders and other mental health needs. ASPE has contracted with RTI International to assist them in learning how states have approached these decisions and the impacts that such systems are having on individuals.

We would like to invite you to participate in a brief interview to discuss the impact and implementation of the inpatient bed tracking system within your state. You were selected because you represent (a state department or agency responsible for implementing or overseeing the inpatient bed registry/a community behavioral health provider that may use the registry to find beds for clients/hospital that submits information on open behavioral health beds/a patient advocacy group the represents consumers and their families who may use the bed registry system) The insight you provide will be invaluable to ASPE's understanding of issues related to ways in which inpatient bed information is being shared with patients, how inpatient bed availability is being tracked, what the impact of tracking has been on patient access, and what challenges remain in inpatient bed tracking in your state.

This interview should take no more than X minutes and will be conducted during a day and time that is convenient for you. We would like to talk with you between August 6th and 24th. If you are willing to participate in this study, we ask that you reply to this email with at least two possible days and times in which we can schedule the interview. If we have not heard from you by X we will follow up with you by phone to schedule a time to talk.

Thank you for your time and consideration. We look forward to talking with you soon.

Sincerely,

Jennifer Howard, PhD
Tami Mark, PhD
Shilpi Misra, BS

APPENDIX B. INTERVIEW PROTOCOL

Thank you for making time to speak with us today. My name is X and I am with RTI International. Would it be ok if we recorded our conversation to help me with my notetaking? As we explained in our email, RTI International (RTI), under a contract with Assistant Secretary for Planning and Evaluation (ASPE), is conducting interviews with state officials, providers, and consumer representatives in states that have implemented psychiatric or substance abuse bed registries. We are particularly interested in systems that allow the information on open beds to be accessed by consumers. We would like to learn about how you collect information the information, the impact of the registry on access to treatment, and any challenges you have encountered. We are interested in your opinion on these topics so there are no right or wrong answers to our questions. The results of the study will be summarized in a brief report to ASPE.

We will conduct the interview as efficiently as possible to make the most valuable use of your time. We expect it to take no more than 60 minutes. Please let me know if you wish to skip any questions or if you would like to stop the interview at any time. Remember that everything you say will be kept confidential and we'll never use your name in our reports.

Before we begin, do you have any questions for us?

Great, thank you. Why don't we begin with a brief introduction of who is on the call, by providing me with your name and job title.

Name(s)

Job Title(s)

- Is your organization currently using the state's bed registry system? If answer "No" Skip to question Q5.
- What are the benefits to your organization of having this bed registry system?
- Please describe how you are using the system?
Probes:
 - How often to you use the system to find an empty bed?
 - Do you use it to find open beds for particular types of patients or under particular circumstances?
 - How frequently do beds turn over?
 - How often is the information updated?

- Do you have any suggestions for making the system more useful?
Probes:
 - Include more providers
 - Include different types of providers
 - More timely data
 - Different types of information

- Do you have any additional feedback on the implementation of inpatient bed tracking systems that we haven't already covered? If so, what?

ANALYSES OF DISABILITY, AGING, AND LONG-TERM CARE POLICY AND DATA

Reports Available

AN OVERVIEW OF LONG-TERM SERVICES AND SUPPORTS AND MEDICAID: FINAL REPORT

HTML <https://aspe.hhs.gov/basic-report/overview-long-term-services-and-supports-and-medicare-final-report>

PDF <https://aspe.hhs.gov/pdf-report/overview-long-term-services-and-supports-and-medicare-final-report>

INPATIENT BED TRACKING: STATE RESPONSES TO NEED FOR INPATIENT CARE

HTML <https://aspe.hhs.gov/basic-report/inpatient-bed-tracking-state-responses-need-inpatient-care>

PDF <https://aspe.hhs.gov/pdf-report/inpatient-bed-tracking-state-responses-need-inpatient-care>

STATE AND LOCAL POLICY LEVERS FOR INCREASING TREATMENT AND RECOVERY CAPACITY TO ADDRESS THE OPIOID EPIDEMIC: FINAL REPORT

HTML <https://aspe.hhs.gov/basic-report/state-and-local-policy-levers-increasing-treatment-and-recovery-capacity-address-opioid-epidemic-final-report>

PDF <https://aspe.hhs.gov/pdf-report/state-and-local-policy-levers-increasing-treatment-and-recovery-capacity-address-opioid-epidemic-final-report>