Key Considerations in Planning for Substance Use Treatment: Estimating Treatment Need and Demand

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ABSTRACT. Objective: Estimates of the extent of treatment need (defined by the presence of a diagnosis for which there is an effective treatment available) and treatment demand (defined as treatment seeking) are essential parts of effective treatment planning, service provision, and treatment funding. This article reviews the existing literature on approaches to estimating need and demand and the use of models to inform such estimation, and then considers the implications for health planners. **Method:** A thematic review of the literature was undertaken, with a focus on covering the key concepts and research methods that have been used to date. **Results:** Both need and demand are important estimates in planning for services but contain many difficulties in moving from the theory of measurement to the practicalities of establishing these figures. Furthermore, the simple quantum of need or demand is limited in its usefulness unless it is matched with consideration of different treatment types and their relative intensity, and/or explored as a function of geography and subpopulation. Modeling can assist with establishing more fine-tuned planning estimates, and is able to take into account both client severity and the various treatment types that might be available. **Conclusions:** Moving from relatively simplistic estimates of need and demand for treatment, this review has shown that although such estimation can inform national or subnational treatment planning, more sophisticated models are required for alcohol and other drug treatment planning. These can help health planners to determine the appropriate amount and mix of treatments for substance use disorders. (*J. Stud. Alcohol Drugs, Supplement 18,* 22–30, 2019)

RÉSUMÉ. Objectif : L'estimation de l'ampleur du besoin de traitement, défini par la présence d'un diagnostic pour lequel un traitement efficace est disponible, et la demande de traitement, définie par la recherche de traitement, sont des éléments essentiels à une planification efficace du traitement, à la prestation de service et à son financement. Cet article passe en revue la littérature existante sur les approches pour estimer le besoin et la demande ainsi que l'utilisation de modèles pour documenter une telle estimation, puis considère les implications pour les planificateurs des services de santé. **Méthode :** Une revue thématique de la littérature a été entreprise en mettant l'accent sur les concepts clés et les méthodes de recherche qui ont été utilisées à ce jour. **Résultats :** Les estimations des besoins et de la demande sont toutes deux importantes dans la planification des services, mais constituent des défis importants lors du passage de la théorie de la mesure aux aspects plus pratiques de production de ces estimations. Par ailleurs, la simple estimation d'un nombre lié au besoin ou à la demande est limitée, à moins qu'elle ne soit appariée avec différents types de traitement et leur intensité respective, ou explorée avec d'autres facteurs géographiques et de sous-population. La modélisation aide à produire des estimations de planification plus précises et permet de prendre en compte à la fois la sévérité des problèmes du client et les types de traitement qui pourraient être disponibles. **Conclusion :** En partant d'estimations relativement simplistes des besoins et de la demande de traitement, cette revue a montré que si ce genre d'estimation peut éclairer la planification des traitements à l'échelle nationale ou régionale, d'autres modèles plus sophistiqués sont nécessaires pour la planification des traitements des problèmes liés à l'usage d'alcool et des autres drogues. Ceux-ci peuvent aider les planificateurs des services de santé à déterminer la quantité et la combinaison appropriées de traitement pour les troubles liés à l'utilisation de substances.

RESUMEN. Objetivo: Las estimaciones de la magnitud de las necesidades de tratamiento, que se define por la presencia de un diagnóstico para el cual existe un tratamiento efectivo disponible, y la demanda de tratamiento, definida como la búsqueda de tratamiento, son parte esencial de la planificación de un tratamiento eficaz, la prestación de servicios y la financiación del tratamiento. Este artículo revisa la literatura existente sobre enfoques para estimar la necesidad y la demanda y el uso de modelos para informar a dicha estimación, y luego considera las implicaciones para los planificadores de salud. **Método:** Se realizó una revisión temática de la literatura, con un enfoque en cubrir los conceptos clave y los métodos de investigación que se han empleado hasta la fecha. **Resultados:** Tanto la necesidad como la demanda son estimaciones importantes en la planificación de los servicios, pero contienen muchas dificultades para pasar de la teoría de la medición a los aspectos prácticos de establecer estas cifras. Además, el simple quantum de necesidad o demanda es limitado en su utilidad a menos que se corresponda con la consideración de diferentes tipos de tratamiento y su intensidad relativa, y / o explorado como una función de la geografía y la subpoblación. El modelado puede ayudar a establecer estimaciones de planificación más precisas, y puede tener en cuenta tanto la gravedad del cliente como los diversos tipos de tratamiento que podrían estar disponibles. **Conclusiones:** Pasando de estimaciones relativamente simplistas de la necesidad y demanda de tratamiento, esta revisión ha demostrado que, si bien dicha estimación puede informar la planificación del tratamiento nacional o subnacional, se requieren modelos más sofisticados para la planificación del tratamiento del alcohol y otras drogas. Estos pueden ayudar a los planificadores de salud a determinar la cantidad apropiada y la combinación de tratamientos para los trastornos por uso de sustancias.

PLANNING FOR SUBSTANCE USE TREATMENT services requires an understanding of the population in need of treatment, the demand for that treatment, and the numbers who receive treatment. The difference between

Received: April 18, 2017. Revision: February 7, 2018.

This article was prepared as part of the Australian Government Department of Health and Ageing commissioned review of alcohol and other drug treatment services but built on a number of pieces of commissioned research including from the New South Wales (NSW) Mental Health and Drug and Alcohol Office, the Youth Substance Abuse Service, Victoria, and work completed as part of The Drug and Alcohol Clinical Care & Prevention (DA-CCP) model, funded by the Commonwealth Department of Health and Ageing and the NSW Ministry of Health (Mental Health and Drug and Alcohol Office). Alison Ritter is funded by a National Health and Medical Research Council (NHMRC) Senior Research Fellowship. Matthew Sunderland is funded by an NHMRC Postdoctoral Fellowship. Jenny Chalmers and Kari Lancaster are funded out of the Drug Policy Modelling Program core funds (Colonial Foundation Trust).

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need or demand and the numbers in treatment represents the "treatment gap." This article explores the central concepts behind treatment planning: the need for treatment, the demand for treatment, and the relationship between need/demand and client severity, treatment type, and treatment setting. We outline the various approaches to measuring treatment need and treatment demand and the substantial challenges in creating estimates to assist health planners. An underlying assumption in the published literature on treatment need and treatment demand is that there is a "treatment service system" that is in some way identifiable as providing care for those with alcohol or other drug problems. Although this is true for most developed nations, it is not the case in the majority of developing nations (World Health Organization, 2017). The literature reviewed for this article, therefore, comes from developed countries and cannot necessarily be generalized to places where health care planning and specialist alcohol and other drug treatment service systems do not exist.

Treatment need—Based on diagnostic criteria

The need for treatment is most commonly defined with reference to diagnostic criteria. Although there are a number of issues with this approach (as detailed later), the underlying assumption is that when diagnostic criteria for an alcohol or other drug use disorder are met, there is a need for treatment. General population surveys are often used to generate estimates. For instance, Wu et al. (2016) reported that 6,125 people met criteria for opioid use disorder in the past year through analysis of the National Survey on Drug Use and Health (NSDUH). Extrapolating from these rates, it was estimated that in the U.S. population, 2,319,213 people might be in need of opioid treatment (Jones et al., 2015). The increases in opioid use disorder in the United States have led to a corresponding increase in estimated treatment need (Jones et al., 2015; Saloner & Karthikeyan, 2015). Treatment need for alcohol use disorder (AUD) is higher. Results from the 2015 NSDUH show that 5.9% of the U.S. population meets criteria for AUD, which suggests that 15.7 million people in the United States might be in need of alcohol treatment (Center for Behavioral Health Statistics and Quality, 2016). The United States is not alone. In Australia, about 320,000 people would be in need of alcohol treatment, given the 1.4% rate of alcohol dependence (Slade et al., 2009).

Given a population estimate of the rate of substance use disorders, the proportion of those that did not receive treatment (referred to as the "treatment gap" or "unmet need for treatment") can be calculated. In many instances, this is alarmingly high. For example, in a U.S. sample of people with a substance use disorder, 83% did not receive treatment (Ali et al., 2015), and in a European sample of people with an AUD, the rate was similar (80%) (Probst et al., 2015). In another U.S. study of people with a cannabis use disorder, 87% did not receive treatment in the past year (Wu et al., 2017). Other research has shown smaller treatment need gaps. Tuithof et al. (2016), in work from the Netherlands, used criteria from the *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* (DSM-5; American Psychiatric Association, 2013), to define the need for AUD treatment. They found that although only 10% received specialist alcohol and other drug treatment (suggesting an unmet need of 90%), 35% of their sample received treatment for emotional or alcohol problems from general health care providers. This important inclusion of general health care treatment over and above specialist alcohol and other drug treatment suggests that perhaps the treatment need gap has been overestimated.

Aside from lack of clarity regarding the nature or type of treatment under consideration, there are a number of other limitations that need to be considered when using diagnostic criteria to define treatment need. First, diagnostic criteria are arbitrary, and thus treatment need estimates will vary depending on the diagnostic system adopted. This has been demonstrated in the changes introduced between DSM-IV (American Psychiatric Association, 1994) and DSM-5 (Mewton et al., 2011, 2013), where changing diagnostic criteria results in changes to prevalence estimates, and hence treatment gap estimates. In addition, the case positive rate can also vary within diagnostic systems, given that criteria might be measured across studies using different scales or interviews that each differ in terms of content, context, response options, delivery mode, and psychometric properties, thereby increasing the variance around the estimates.

Another issue is the difference between abuse and dependence. In most studies using DSM-IV diagnostic criteria, both abuse and dependence criteria have been applied. DSM-5 no longer retains such a distinction, using the general Substance Use Disorder as the diagnosis and may therefore further conflate unmet need estimates. Haughwout et al. (2016) highlight the increase in the treatment gap if both dependence and abuse criteria for adolescents are used. The rate of treatment utilization for abuse and dependence, respectively, for alcohol was 9% and 15%; for cannabis, 15% and 18%; and for other illicit drugs, 11% and 21%. This indicates a higher unmet need for those with abuse diagnoses compared with dependence diagnosis, and when merged together, may inflate the overall unmet need estimate. At the same time, Wu et al. (2017)—examining cannabis use disorders in the United States—found nonsignificant differences in treatment utilization between those with cannabis abuse compared with cannabis dependence.

Second, most of the existing research estimating treatment need from diagnostic rates uses general population surveys. Many subpopulations are not usually covered in these surveys (e.g., indigenous people, the homeless, people in institutions at the time of the survey), almost all of which will

have a higher percentage meeting diagnostic criteria. Third, when using diagnostic criteria to define treatment need, it is assumed that anyone who meets substance use disorder criteria is in need of and should receive treatment services. However, formal treatment services are not necessarily required for remission of alcohol or other drug problems; the role of maturation and spontaneous remission is important to acknowledge (Sareen et al., 2013; Walters, 2000). As shown in Tuithof et al. (2016), remission from AUDs in the absence of treatment can be high (in their study at 3 years, 77.9% of those in the no-treatment group had fully remitted). On the one hand, this suggests that a significant number of people who meet diagnostic criteria (DSM-5) will not require any intervention to resolve their alcohol problem. On the other hand, there may also be people who do not meet the formal diagnostic criteria (so-called subthreshold cases) who may receive and/or benefit from treatment (Druss et al., 2007; Grella et al., 2009).

Clearly, a crucial aspect to the estimation of the treatment need gap is accounting for spontaneous or natural remission. If the proportion of people who cease problematic alcohol or other drug consumption in the absence of treatment were known, the treatment need gap could be more accurately calculated. Research has shown widely different rates of spontaneous remission from AUDs: varying between 24% (Moos & Moos, 2005) and 75% (Dawson, 1996). Increasing the precision of these estimates requires methodological and conceptual work. For instance, the rate of spontaneous remission will vary depending on the definition of alcohol problem (Cunningham, 1999), the definition of remission (Dawson et al., 2005), and the severity of dependence (Tuithof et al., 2016). Also, the definition of treatment affects the rate of spontaneous remission. For example, when engagement with self-help groups is included as a form of treatment, the proportion of untreated people (relative to treated people) will decrease. With newer forms of access to self-help treatment, such as through websites or apps designed to curb substance use, much greater attention to defining treatment is required.

Alternatives to treatment need

In light of the multiple issues noted above with regard to treatment need estimation, alternatives are to focus on treatment demand or to use harm indicators (the "treatment need index" approach).

Treatment demand. Demand for treatment is operationally defined as an intention to seek treatment. Unlike the treatment need estimates, which rely on professionally defined specific standards, the demand for treatment estimates take into account the active role clients play in the decision to seek and receive treatment and, thus, focus on only those who show a desire to receive treatment. Demand in this framework is measured either through self-reported intentions to seek treatment or through self-reported perceptions of the need for treatment.

According to the World Health Organization's World Mental Health Surveys, 39% of people with substance use disorders reported a need for treatment (Degenhardt et al., 2017). Other estimates have been smaller. For instance, U.S. data suggest that only 8.5% of those with a substance use disorder perceive a need for treatment, with 15% reportedly using services at a 3-year follow-up (Mojtabai & Crum, 2013). Perceived need for treatment may vary by substance type. For example, Meacham et al. (2018) found that more than half of the sample of people who inject drugs perceived a "great or urgent" need for treatment, whereas Blanco et al. (2015) reported a 5% rate for alcohol dependence. Despite the apparent simplicity of surveying people about their perceived need or intention to seek treatment, this raises issues of insight, and problem awareness. A relatively high number of people do not perceive that they have a substance use problem (Probst et al., 2015) despite meeting diagnostic criteria. This suggests that using self-reported perceived need for treatment may underestimate the size of the treatment gap.

An alternative to measuring intention to seek treatment is to use waiting list data, based on the assumption that those who want and actively seek treatment will be counted within any waiting list system. Waiting for treatment can be quantified by reporting the range of waiting time, the average length of waiting time, or the number of people waiting for treatment. For instance, the range of waiting time has been reported to be between 0 days and 384 days for substance use disorder treatment in the United States (Hoffman et al., 2011); the average waiting time for treatment entry (the time between assessment and treatment entry) has been reported to be 65 days in Ohio (Carr et al., 2008); and 76% of clients were required to wait before entering methadone maintenance treatment in Israel, with an average waiting period of 1.1 years (Peles et al., 2012).

Although using waiting time as a tool to estimate unmet demand is plausible in theory, in practice there are a number of issues that arise, including the absence of formal waiting list data; double counting across waiting lists; discrepancies in the perceptions of waiting time between client and service providers; prioritization of clients into waiting lists (e.g., pregnant women); partial support provided to people in waiting lists; and lack of consideration of the number of people waiting for a service that is not available (Hadland et al., 2009; Milloy et al., 2010; Peterson et al., 2010; Redko et al., 2006). Awareness of waiting periods can discourage initiation of service contact, which means that waiting lists underestimate potential demand. Waiting lists can also shift demand to other geographical areas, important if planning is localized. Thus, "the queue is an arbitrary snapshot, reflecting only a truncated frame" (Rotstein & Alter, 2006, p. 163). The notion of waiting is highly individualized, dynamic, and

driven as much by an unmet demand for treatment as by extraneous factors such as the attractiveness of treatment and the perceived likelihood of treatment entry.

Treatment need indexes. Another planning method for informing the treatment gap is to use an index approach. Treatment need indexes do not rely on epidemiological rates of disorders/diagnoses, nor on understanding treatment-seeking data. Rather, they determine the level of treatment service provision needed by mapping alcohol and/or illicit drug–related harms. Here, harm indicators (assessed largely through administrative data) serve as proxies for treatment need (Moxham-Hall & Ritter, 2017). For example, the social indicators approach uses a variety of social indicators to predict the need for alcohol and/or drug treatment services (Beshai, 1984; Gregoire, 2002; Sherman et al., 1996). For alcohol treatment, the indicators have included the number of alcohol outlets, mortality rates, drink driving arrests, alcohol-related traffic offenses, domestic violence arrests, and measures of housing cost and overcrowding.

From this work on estimating need for treatment, McAuliffe & Dunn (2004) and McAuliffe et al. (2002) developed alcohol and drug need indexes for each U.S. state and for specific towns. The indexes (the Drug Need Index, Alcohol Need Index, and Substance Abuse Need Index) cover more than one domain (i.e., are multi-dimensional) and aggregate into a single figure for a country, state, or town. There have been no analyses that we are aware of that compare the utility and feasibility of the treatment need index approach with the epidemiologically driven survey approach to need (as defined by diagnosis) or demand estimates (through intentions to seek treatment or waiting list data).

The treatment need, treatment demand, or index approaches all have their own limitations. What they share, however, is that none of these methods can assist health planners with identifying what types and intensity of treatment are required for which populations. Therefore, models that can account for varying levels of client severity, along with different settings and types of treatment, can potentially generate need/demand data that have a much greater level of specificity. A newer wave of work in this area takes this modeling approach through redefining need and demand in light of individual and system characteristics.

Redefining need and demand to improve specificity for treatment planning

Brian Rush (1990) was one of the first researchers to develop a new approach when estimating treatment need. In calculating the required level of treatment provision for defined planning areas in Ontario, Canada, Rush moved away from using diagnostic criteria to define treatment need and instead estimated treatment need along a continuum-of-care using three sources of data (alcohol-related deaths, alcohol consumption and/or negative consequences of alcohol use, and alcohol sales data). In the mid-2000s, Rush and colleagues extended the continuum-of-care model to a tiered model (Rush, 2010).

The tiered model breaks down treatment need into five tiers, with each tier representing a different level of treatment type and treatment intensity dependent on substance use severity (composed of acuity, chronicity, and complexity) (Rush et al., 2014). The five tiers are described as low risk, moderate risk, active risk/harm, chronic harms, and complex/high severity (Rush et al., 2014). This model is predicated on different categories of problem severity, reflecting tiers of a population health pyramid, such that the need for more intensive treatment and support increases for people in the higher compared with lower tiers. The estimated rates of help-seeking (referred to as the "probable help-seeking population") vary by the tiers, and the model developers made extensive use of Delphi procedures to derive estimates for the model. The model includes a variety of treatment types, including withdrawal management, community services, and residential services as well as screening, brief intervention, and referral to treatment from generalist services. This model has been piloted in nine sites across Canada, with a number of lessons learned (Rush et al., 2019).

More recently, the models used by Rush and colleagues (2014, 2019) have been adapted to specific contexts. For instance, the Need for Addiction Services Estimation Model for Youth (NASEM-Y) (Tremblay et al., 2019) generated treatment need estimates for youth displaying substance misuse in Quebec, Canada. Similar to the models developed by Rush and colleagues, the NASEM-Y uses different arms of data (i.e., alcohol and other drug misuse prevalence data and indices of mental health and psychosocial difficulty) to generate tiers of severity, and further uses different modes of data (i.e., Delphi consensus groups and treatment utilization data) to match each tier of severity with a treatment type and ultimately a specific need estimation (Tremblay et al., 2019).

The work by Rush and colleagues (2014, 2019) has also been adapted in Australia, using routinely collected data on alcohol and other drug treatment services (Barker et al., 2016). Unlike the Canadian-based tier model, which measures substance use severity through acuity, chronicity, and complexity, the work by Barker and colleagues measures substance use severity through problem severity (as indicated by Alcohol Use Disorder Identification Test and Drug Use Disorder Identification Test scores) and complexity scores (as indicated by high psychological distress, housing instability, and an absence of meaningful activity) (Barker et al., 2016).

Ritter et al. (2019) have developed another model for estimating the treatment gap that includes attention to problem severity, treatment types, and differentiating need and demand. This model estimates the prevalence of substance use disorders by drug type, age group, and severity and then uses expert consensus to estimate demand for treatment

within each of these subgroups. The demand for treatment is then distributed between service types, matching problem severity with the appropriate type of care (referred to as care packages that represented evidence-based and/or expert judgment regarding care for 1 year). The model calculates both the numbers of required treatment places and the resources required to deliver that level of care.

In a final example of a modeling approach, Brennan et al. (2019) take a different approach. Although the Specialist Treatment for Alcohol Model (STreAM) estimates the number of people potentially in need of alcohol treatment (by estimating the gap between need and current treatment utilization), this is its starting point, and the primary aim is to predict future costs and impacts associated with changing access rates. The model is dynamic: estimating future treatment demand, treatment success rates, ageing effects, and resources required. This model is then used to test various scenarios of changing access rates (such as increasing access by 25%). The model can then produce estimates for how such an increase in access rates can flow on to treatment outcomes and the resource implications. As a planning tool, it enables health planners to estimate future resource requirements (both costs and savings) under different scenarios.

What all these modeling approaches have in common is that they are endeavoring to provide health planners with decision support tools to aid in more effective allocation and distribution of treatment services and associated funding. In modeling the numbers of treatment places required, all the models combine concepts of treatment need and treatment demand and incorporate both client characteristics (such as severity or complexity) and different types of treatment (on a continuum). Health planners need to know more than the simple quantum of treatment to be provided—they need to know which types of treatment and the settings in which they are provided, especially given that client severity affects appropriate levels of treatment, and that willingness to enter treatment varies by setting (Barry et al., 2016). However, despite their sophistication, more work is required to advance these models in practice and enhance the likelihood that health planners will take them up.

Future developments in modeling treatment need/demand

The issue of spontaneous or natural remission remains a challenge for any modeling approach. It is vital to incorporate untreated remission rates into a planning tool because health planners do not want to overestimate treatment demand. Both the Brennan model (Brennan et al., 2019) and the Ritter model (Ritter et al., 2019) use pre-existing estimates of natural remission, but more research is required to refine these estimates and make them fit for purpose, as discussed earlier. One central concern for natural remission is clarity about the definition of treatment and what is included or excluded. Planners do not need to plan for services they do not fund (such as self-help programs), but this involves disentangling the pathways to natural remissions from the existing research estimates.

Another future challenge for modeling approaches is the ability to model variation in treatment need and demand by specific subpopulation. Vulnerable populations frequently reported in the literature include non-Whites and lesbian, gay, bisexual, and transgender individuals. For example, compared with Whites, non-Whites report a significantly higher unmet need for treatment (e.g., Liebling et al., 2016; Wu et al., 2016). Compared with men who identify as heterosexual, those who identify as bisexual or gay report a higher unmet demand for treatment (Fisher et al., 2017). Other vulnerable populations include people with low incomes, veterans, people reporting an overdose history, people who use cocaine and amphetamines, and people experiencing homelessness (Fisher et al., 2017; Golub et al., 2013; Jeong et al., 2016; Liebling et al., 2016).

Finally, modeling needs to move away from the research environment into practice. Although pilot studies have been reported (see the examples in this special issue), the routinization of decision support tools is a long way off. Most of the models require specialist support, have yet to develop user-friendly interfaces, and rely on relatively fixed or stable parameters than cannot be easily adapted to local context or local planning needs.

Application to health planning

Health planners need to move beyond any simple notion of treatment need or treatment demand. The deployment of models (in collaboration with researchers) could substantially advance local planning. A prerequisite, noted by Rush et al. (2019), is for planners to collate accurate estimates of current met demand. Without an understanding of current met demand, the treatment gap cannot be identified.

Current met demand (treatment use)

There are both conceptual and practical challenges in establishing current treatment utilization rates. The main conceptual challenge pertains to the definition of treatment. The United Nations Office on Drugs and Crime (UNODC) specifies that "Drug treatment is considered to be any structured intervention aimed specifically at addressing a person's drug use" (UNODC, 2006, p. 23). Although some services easily fit within this definition (e.g., withdrawal, residential rehabilitation, assessment and brief intervention, and pharmacotherapy maintenance), other processes that may effectively ameliorate a substance use disorder are not included (e.g., the provision of housing or employment, and social support). Furthermore, there are also many forms of treatment that exist outside the formal treatment system (e.g., Alcoholics Anonymous). This challenge has become

more acute as alcohol and other drug treatment evolves into integrated mental health services, a greater focus on primary care service provision, and moves toward collaborative care. It is not necessarily clear whether treatment provided in specialized mental health services for people who have co-occurring substance use disorders is counted as substance use treatment. As Tuithof et al. (2016) demonstrate, when general health care (for emotional or alcohol problems) is included in estimates of treatment need, the rate of unmet treatment substantially decreases.

The practical challenges associated with estimating current treatment utilization rates have recently been highlighted in a study that estimated the number of people in receipt of substance use disorder treatment in Australia, over a 1-year period (Chalmers et al., 2016). The challenges included the issue of treatment episodes versus individuals in treatment; identifying unique individuals across multiple treatment data sets given the diversity of treatment providers and data systems; and ensuring capture of substance use disorder treatment that is provided outside the specialist treatment services (Chalmers et al., 2016). On this last challenge, for example, in a U.S. sample of people with substance use disorder who reported no history of any other mental, behavioral, and/or emotional disorder and perceived a need for treatment, 21% reported receiving mental health treatment, and only 11% reported receiving substance use treatment (Ali et al., 2015). The use of a Treatment Demand Indicator (Simon et al., 1999), wherein unique identifiers are used, can overcome some of these challenges, although adoption has been shown to be patchy (Antoine et al., 2016).

Evolving systems of care

Demand for treatment is not divorced from the characteristics of the treatment service system, as demonstrated by the behavioral model for health service utilization (Andersen & Newman, 2005). Although the results of a planning tool will identify the amount, type, and location of new treatment places that are required, its very implementation may dynamically disrupt those estimates. Increasing access to substance use treatment may decrease the unmet need for treatment, but it may also increase the unmet demand, as greater access increases the likelihood of treatment seeking and may reduce some barriers such as stigma. Furthermore, as treatment places increase, waiting times can increase (sometimes referred to as "induced demand"; Rotstein & Alter, 2006).

For example, in the United Kingdom between 1995 and 1999, there was a doubling of opioid substitution treatment places (and some additional funding), and across the same period, waiting times went from 3.6 weeks to 8.4 weeks (Stewart et al., 2004). (See also Bammer et al., 2000; Brands et al., 2002; Kaplan & Johri, 2000.) In addition, when unmet demand for one treatment type decreases, the unmet demand for another treatment type may increase, as in the case of increasing drug withdrawal service capacity, which then affects postwithdrawal rehabilitation services. Therefore, simply providing more treatment places based on unmet need or unmet demand estimates will not necessarily meet demand and may shift demand away from (or to) other alcohol or drug treatment types. None of this makes it simple for health planners.

Another consideration is the implied conceptualization of substance use treatment, which until recently has been treated as an episodic intervention. Measures of need and demand for treatment are at a fixed time point—whether that be on a particular day, or in 1 year, and with reference to a quantum of withdrawal, or residential rehabilitation, for example. This fixed episodic notion of treatment need or demand is inconsistent with the view of substance use disorders as chronic, lifelong conditions requiring ongoing care within a disease-management framework (Proctor & Herschman, 2014). Conceptualizing substance use disorders within a disease-management framework has consequences for the design of treatment service systems, which require capacity for stepped care (bi-directionally over time) and a system of linked service components (Padwa et al., 2016) inclusive of social welfare and general health care. This "service system approach" calls for a rethinking of treatment need and demand estimation, which to date has largely remained confined to epidemiological estimates for a single year or underpinned by assumptions of episodic treatment delivery.

A final consideration is the way in which models of need and demand are dependent on prevailing notions of treatment and health care systems. These arise from developed countries with sophisticated health care planning and programs. Most countries have marginal or fragmentary treatment services, and few have "systems" that act in a coordinated way (World Health Organization, 2017). Unsurprisingly, the extent of the treatment gap also varies between high-, middle-, and low-income countries (Evans-Lacko et al., 2018). Further, the prevailing notions of treatment vary over time. As noted by Rush et al. (2019), newer approaches, such as Internet and mobile technologies, mean that any modeling must remain flexible and adaptable to new types and sites of treatment. Furthermore, with the uncertainty and spontaneity of the real world, models need to be reactive and flexible enough to adequately respond to short-term epidemiological trends (e.g., binge drinking or opioid overdose epidemics).

Conclusions

There are no easy solutions to improving the specificity, accuracy, and utility of health planning approaches. Both the research community and health planners need to work together. For the research community, pressing questions remain about natural remission, the capacity of models to

be adapted over time and local context, improved tools for estimation of current treatment utilization, user-friendly model interfaces, and some important conceptual puzzles (such as "what is treatment?"). For health care planners, a comprehensive understanding of their own "treatment service system" and the boundaries to their planning function (including, for example, funding systems, catchment areas, and private for-profit inclusions) and comprehensive analysis of current treatment utilization are essential to advance planning efforts.

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