Development of a Needs-Based Planning Model for Substance Use Services and Supports in Canada:

Interim Report

DRAFT

Brian Rush
Joël Tremblay
Renée Behrooz
Chantal Fougere
and
Wendi Perez

Health Systems and Health Equity Research Group
Centre for Addiction and Mental Health

May 04, 2012
# Table of Contents

1.0 Introduction and Background .................................................................................................................. 1  
  1.1 Tiered Frameworks to Support Treatment System Planning................................................................. 4  
  1.2 Reconciling the Tiered Framework and the Continuum of Care Approach ...................................... 12  
  1.3 Going from Tiered Frameworks to Needs-based Planning ................................................................. 19  

2.0 Defining Need .......................................................................................................................................... 27  
  2.1 Conceptual and Measurement Issues .................................................................................................. 27  
  2.2 A Feasible Measurement Model for Needs-Based Planning in Canada ............................................ 34  

3.0 Defining the Treatment System for Required Capacity Estimation ....................................................... 39  
  3.1 Services Required to Deliver Treatment System Functions .......................................................... 53  
  3.2 Schematic Diagram of Needs-Based Planning Model for Substance Use Services and Supports .......................................................... 57  
  3.3 Populating the Parameters of the Model ............................................................................................. 63  

4.0 Limitations, Special Considerations and Next Steps .............................................................................. 66  
  4.1 Modeling and Estimating ................................................................................................................. 68  
  4.2 Internet and Mobile-Based Services ............................................................................................... 68  
  4.3 Sub-Populations ................................................................................................................................ 69  
  4.4 Services for Family Members and Significant Others .................................................................... 69  
  4.5 Gambling Services .......................................................................................................................... 69  
  4.6 Non-Survey Populations .................................................................................................................. 69  

References .................................................................................................................................................... 72  

Appendix A ................................................................................................................................................ 84  
Appendix B ................................................................................................................................................ 85  
Appendix C ................................................................................................................................................ 86  
Appendix D ................................................................................................................................................ 87  
Appendix E ................................................................................................................................................ 89  
Appendix F ................................................................................................................................................ 91  
Appendix G ................................................................................................................................................ 92
1.0 Introduction and Background

It is now well established that a relatively small proportion of people in the community who experience substance use problems seek assistance from the specialized sector of services that has been commissioned specifically to provide treatment and support to people with these problems. The data supporting this assertion are drawn largely from general population surveys that variously define the need for treatment and also inquire about formal and informal help seeking within a defined timeframe. Such data on the so-called “treatment gap” have supported the case for a more comprehensive view of the substance use treatment system, arguing that a discernable impact at a population level is not likely to be achieved only through provision of substance use agencies mandated specifically to serve people with the most severe and complex needs (e.g., Babor, Stenius, & Romelsjo, 2008). A broader population health approach is needed, one that engages multiple sectors such as health, social welfare, criminal justice, and education in a comprehensive system of services and supports. This means building substance use treatment capacity in the settings where people with substance use problems are more typically engaged (e.g., primary care, emergency departments, criminal justice). It also means implementing early intervention, health promotion and prevention policies and services for those at risk of developing these problems while working to link these initiatives to the treatment system. Policies and programs designed to reduce stigma and discrimination of people with substance use problems are also critical since they can impact help-seeking and participation in treatment and early intervention.

One can locate the roots of this “modern” view on treatment systems in seminal reports from the early 1990s (most notably the Institute of Medicine report (1990)) which called for “broadening the base of treatment” in order to achieve wider coverage and yield positive outcomes at a population level. Figure 1, adapted from Babor and colleagues, gives a perspective on the wide range of service delivery settings and contexts to be considered in broadening the base of treatment and integrating services into a coherent treatment system.

---

1 This introduction draws heavily upon a paper by Rush (2010) on the evolution of tiered frameworks for planning substance use treatment systems.
Paralleling this more comprehensive perspective of what comprises the treatment system, has been a broader understanding of the nature of substance use problems. It is now commonly recognized that the construct of “substance use problems” is multi-dimensional, comprised of substance use (frequency, quantity and variability), substance abuse (essentially negative consequences of use), and substance dependence (Hasin et al. 2006; Rehm, 2008). However, evidence from studies involving people from the general population and treatment/health care settings also shows that heavy substance use, abuse and/or dependence frequently co-occur with mental health problems, physical illness and a range of psychosocial needs. Thus, the overall problem profile is complex and exists in varying degrees of severity. This heterogeneity is not well-captured in current nosological systems.

One approach to the conceptualization of problem severity suggests that it consists of three inter-related dimensions: acuity, chronicity and complexity (Reist & Brown 2008). Acuity refers to short duration and/or urgent risks or adverse consequences (e.g., accidents or criminal charges) that are associated with the index problem (e.g., heavy substance use or dependence).
Chronicity refers to the development or worsening of long duration or enduring conditions (e.g., major depression or other mental disorders, chronic pain, Hepatitis C).

Complexity refers to the degree of co-occurrence of the acute or chronic index problems and/or the existence of health and social factors such as homelessness, unemployment, family dysfunction that complicate the process of addressing the index problem(s). Complexity is a concept that is being applied more frequently to individual assessment and treatment planning in the field of psychosomatic medicine (Huyse et al., 2006); the planning and implementation of various strategies for integrating mental health and substance use services with broader health care services and systems (e.g., Kathol et al., 2009); and risk-adjustment for outcome monitoring and costing purposes (Hermann et al., 2007). Here we apply it to needs-based planning at a population level.

Substance use problem severity thus represents the cumulative gestalt of acuity, chronicity, and complexity, akin to the concept of “level of burden” (Aldworth et al., 2010) or “multi-morbidity” (Angst et al., 2002). For planning purposes, it is also important to consider how these acute and chronic problems converge at different points in time in the individual’s life course and thereby influence the trajectory of help-seeking and service utilization – often referred to as the “treatment career” (Anglin, et al. 1997).
Figure 2 illustrates the distribution of substance use problem severity within the general population, a distribution that can be described as the population health pyramid. The highest levels of severity are associated with the fewest number of people who need the most costly specialized and/or intensive care. Those with lower levels of problem severity are more numerous and their needs can be met by less intensive or less specialized care that is more widely available in a variety of health and social service contexts, as well as more informal community and/or family networks of support. Computer and mobile-based services are also becoming more widely available (Bewick et al, 2008; Cunningham & Van Mierlo, 2009). The bottom of the pyramid reflects people at low risk – the target population for secondary and primary prevention. The population health pyramid underlies what is often referred to as the Chronic Care Model, to be discussed in more detail below. Simply put, the broad “treatment system” must be planned in such a way as to respond effectively and efficiently to this full spectrum of acute, chronic and complex needs.

1.1 Tiered Frameworks to Support Treatment System Planning

For substance use treatment systems, there is no generally accepted conceptual framework to guide planning and resource allocation; indeed the form such a framework would take depends on the prevailing views of substance use problems and their treatment; extant knowledge of evidence-based practice; the purpose to which the model will be put; and, perhaps most importantly, the social, political and cultural context for model development, implementation and evaluation.

1.1.1 Continuum-of-care

The concept of the “continuum-of-care” underlies one such conceptual framework that has been brought to bear for several years in the substance use field, and which continues to hold currency in many parts of the world. Briefly, one can view the continuum-of-care as being organized along categories of service delivery that correspond to a mix of services and expected flow of clients into and through various treatment settings and functions (e.g., intake, screening, assessment and treatment planning, withdrawal management/detoxification, stabilization,
treatment intervention, continuing care\textsuperscript{2}). A systems framework based on a continuum-of-care approach rests upon a model of problem severity that is also on a continuum. Thus, a range of treatment settings offer interventions of varying intensity and structure (e.g., social versus medical withdrawal management, community treatment\textsuperscript{3}, day/evening treatment, short/long term residential) that are accessed by clients on the basis of problem severity and other matching criteria such as stability of the person’s life situation, psychiatric comorbidity, and status of his/her environment, with respect to relapse prevention (Toche-Manley et al., 2011). Such an approach underlies the widely used ASAM criteria for matching people seeking help to various levels of care (Gastfriend, 2003; American Association of Community Psychiatry, 2009). It also provides the foundation for assessment and matching protocols in several jurisdictions, including Ontario (Cross & Sibley-Bowers, 2002). The work in the Netherlands on system development based on client-treatment matching is also noteworthy in this regard (Schippers et al., 2002).

Past system design efforts that hinge on the continuum-of-care model include the “Core-Shell Model”, whereby centralized functions of intake, assessment and case management (the core) match and link clients to the array of treatment services required for the overall client population (the shell) (Glaser, 1974; Marshman, 1978). Another more recent system design framework that is also based on continuum-of-care principles is the “stepped care” approach such that clients are assigned on the basis of assessment to the least intensive and intrusive level of care and then “step-up” if outcomes are not positive and, when appropriate, “step-down” for the maintenance of gains and ongoing support (Breslin et al., 1998; Sobell & Sobell, 2000). From a historical perspective, the continuum-of-care model was a significant advance over a “one-size-fits-all-approach” to delivery of substance use treatment services, for example, the 28-day “Minnesota Model” of residential treatment (Winters et al., 2000). As useful as it has been, however, the continuum-of-care approach appears to have now been subsumed under the broader systems approach described earlier, since the continuum of care traditionally has included only the specialized sector of substance use services.

\textsuperscript{2} Recently the concept of continuing care has been expanded to include “Recovery Monitoring Check-ups” (Dennis, Scott and Funk, 2003; Rush, 2008).
\textsuperscript{3} “Community treatment” is the term used in Ontario, for what other jurisdictions call outpatient services.
1.1.2 Beyond the Continuum-of-Care to Tiered Frameworks

One of the first conceptual frameworks for substance use treatment systems that moved beyond the continuum-of-care approach was advanced in 1990 in a seminal report from the Institute of Medicine (1990) in the U.S., and which drew heavily on Canadian research and expertise. A more recent approach is referred to as the “tiered framework” or “tiered model”, a systems modeling approach that has found its way in the last decade into planning documents for both mental health and substance use services from several countries, including the UK (National Treatment Agency for Substance Misuse, 2006), Australia (National Mental Health Strategy, 2004), Canada (Hollander and Prince, 2008; National Treatment Strategy Working Group, 2008), and Europe (Baldacchino & Corkery, 2006). The roots and evolution of tiered frameworks has been described by Rush (2010). Briefly, such frameworks have their origins in the Chronic Care Model (CCM) for the treatment and management of chronic illnesses such as diabetes, or other long-term health conditions (Wagner, 1998; Bodenheimer et al., 2002) as well as integrated service delivery models that sought to operationalize the CCM. In particular, the Continuity-of-Care Model (McGonigle et al., 1992) and the so-called Kaiser Triangle (Wallace, 2005) defined “levels of chronic care” that were based on level of risk and problem severity, a fundamental aspect of tiered approaches for substance use treatment, and mental health services generally. The Continuity-of-Care Model and the Kaiser Triangle both share the idea of service delivery tiers matched to the distribution of severity at the population level.

The National Treatment Agency for Substance Misuse in the UK led the way internationally in the development and application of tiered frameworks in the substance use field. The essential idea was to define a set of tiers (as in the Kaiser or Continuity-of-Care models); locate various elements of a comprehensive treatment system in the various tiers; and then work with local jurisdictions to, over time, address system gaps through funding and/or more integrated policies and care planning. The first attempt, in 2002, defined four tiers on the basis of a combination of setting, interventions and the agency responsible for providing the interventions (National Treatment Agency, 2002). This “mixed bag” of criteria for allocating elements of the treatment system to a particular tier resulted in considerable confusion and variability in application, in particular an overly rigid interpretation of the tiers. Of particular concern was the view that
certain types of service providers were “slotted into” one particular tier even though they provided services that may span more than one tier\(^4\). A revised model was released in 2006 which defined the four tiers on the basis of “interventions” offered within them, and provided greater clarity around the nature of these interventions, the settings in which they may be located, and the competencies required for them to be successfully offered to clients and their families. Inherent to the definitions of tiers 1 through 4 is the population distribution of severity as reflected in the Kaiser triangle.

In addition to articulating these tiers and their various elements, the UK framework identified several critical features in support of the client’s “treatment journey” recognizing that treatment is more of a process than an event, and offering important citations to longitudinal research on treatment trajectories. These critical features included treatment engagement, treatment delivery (including maintenance), community integration (which underpins both delivery and treatment maintenance or completion), and treatment completion (for those who choose to be drug free). Several concrete options were recommended to operationalize these features, such as “keyworkers” who are dedicated practitioners responsible for ensuring the client’s care plan is delivered and reviewed; and customized “integrated care pathways” that are dynamic and flexible to changing client needs. Such concrete options for service continuity are reminiscent of the details embedded in the Chronic Care Model and the Kaiser Triangle, and reinforce the critical importance of linkage and transitions across the tiers, as well as the system-level supports that are needed to sustain these linkage mechanisms (e.g., e-health capability to transfer assessment and treatment information).

In 2008, a Canadian report entitled Systems Approach to Substance Use in Canada: Recommendations for a National Treatment Strategy was released (www.nts-snt.ca). A five-tiered framework in support of a broader systems approach was a key element, and drew substantively upon the UK approach. As in the UK, the framework was based on the idea that different service categories were embedded in each tier. These categories aligned with different levels of problem severity of the help-seeking population. That said, significant challenges arose with definitional

\(^4\) The original document had explicitly stated this was not the case, however.
issues (i.e., what elements of the treatment system really fit into what tiers, and how much flexibility in interpretation was tolerable?). The challenges were reminiscent of the UK “tier trap” whereby different types of service models were seen as belonging to a tier even though they could also provide functions across other tiers.

However, major differences and improvements upon the UK framework, included:

- the addition of a fifth tier focused on prevention and health promotion;
- a broader set of criteria defining the tiers;
- a clearer role for natural, informal systems of support such as family and friends, and community structures such as neighborhood associations;
- a clearer role for self-help (e.g., which was conceptualized as largely Tier 1 on the basis of its open).

In 2008 an Ontario report on system design was developed in support of the 10-year mental health and addictions strategy. This report adapted the tiered model from the national treatment strategy to incorporate addictions, mental health and problem gambling. The integrated tiered model is shown in Figure 3.

In this framework there were five tiers comprised of ‘functions’. A function was defined as a higher-order grouping of like services or interventions aimed at achieving similar outcomes and targeted at a particular level of problem severity. Thus, the term ‘function’ was interpreted broadly, including components along the continuum of care (e.g., outpatient or residential treatment); a multidisciplinary team providing specialized care (e.g., Assertive Community Treatment); a class of interventions (e.g., screening, self-management, pharmacotherapy); a type of risk management/reduction (e.g., emergency medical care, psychosocial crisis intervention, needle exchange); a population-based initiative (e.g., health promotion); or any of a variety of types of general counseling and support (e.g., continuing care, case management, support groups). Since a range of functions from more than one tier may be provided within one program/service, a

---

5 This built upon work underway at the same time in Alberta, Canada that also aimed at one integrated tiered model for mental health and substance use services and which separated three sub-populations: people with mental health problems, people with substance use problems substance abuse, and people with co-occurring disorders (Fraser, 2009).
function is thereby distinguished from the program or service in which it is embedded (e.g., a primary care service; a substance use program; a community mental health agency).

The functions were grouped within tiers that reflected an increasing degree of specialization with respect to the nature of the function provided and the competency requirements of the service provider to address mental health, substance use, and/or gambling problems. This increased degree of specialization also was considered to correspond to increased problem severity (as described in Figure 3) such that the higher the tier, the higher the severity of the target population and the fewer the number of people in need of the specialized service.

**Figure 3: Integrated tiered framework for mental health, substance use and problem gambling**
The functions associated with each of the tiers of the Ontario tiered model were described as follows:

**Tier 1:**

Population-based health promotion and prevention functions targeted at the general population

- This tier is comprised of functions that are designed to enhance natural systems and networks of support for individuals, families and communities. This includes an emphasis on the social determinants of health as well as education and policy functions aimed at the general public with the objective of promoting healthy lifestyles and preventing the development of mental health, substance use or gambling problems.

**Tier 2:**

Early intervention & self-management functions targeted to people at risk

- This tier is comprised of functions targeted to people with emerging or unidentified problems. The functions include screening/identification, information & referral, brief interventions, brief psychotherapy, psychopharmacy, self-management, motivational and peer support functions.

**Tier 3:**

Treatment planning, risk/crisis management and support functions targeted to individuals with identified problems

- This tier is comprised of functions targeted to people with identified problems who are not engaged in, or have completed specialized treatment. These functions may serve as a doorway to higher tier, specialized care functions and lower tier, self-management and mutual aid functions. Examples of these Tier 3 functions include comprehensive assessment/diagnosis, outreach/engagement, and case management. They also include general support functions (e.g., continuing care, supportive counseling, support groups, walk-in services) as well as functions designed to reduce the risks and consequences associated with the identified problems (e.g., emergency/acute medical care, psychosocial crisis intervention, and needle exchange).
Tier 4:
Specialized-care functions targeted to people assessed/diagnosed as in need of more intensive or specialized care

- This tier is comprised of, but not limited to, most of the functions generally considered to be part of the specialized mental health, substance use and problem gambling treatment systems. The functions include ambulatory and structured residential interventions, including pharmacotherapy, psychotherapy, and may involve multidisciplinary teams (e.g., ACT). These are specialized treatment functions intended to be delivered by individuals with special training to people who have been assessed/diagnosed as requiring this level of specialization. The function is unrelated to setting (e.g., a primary care physician providing pharmacotherapy for alcohol dependence or depressive disorders is providing a Tier 4 function).

Tier 5:
Highly specialized-care functions targeted to individuals with complex problems

- These are functions designed for people with particularly complex or severe mental health, substance use or gambling problems or combinations of these problems (e.g., inpatient medical withdrawal management; comprehensive inpatient/residential concurrent disorder services; inpatient forensic services; long-term inpatient psychiatric care).

As in the UK model, and the Canadian adaptation for the Systems Approach (National Treatment Strategy Working Group, 2008), the fact that people can enter this comprehensive service and support system at multiple points is of critical importance (i.e., the concept of “any door is the right door”). Thus, people may access the system by way of any of the five tiers and, upon entry, should be linked to other functions within or across tiers according to their needs. The system is also to be operationalized in such a way as to facilitate transitions across the tiered functions as dictated by the individual’s needs. Thus, no part of the system “owns” the person; they are a client of the entire system. The set of core service/system principles described in the right hand and left hand side-bars of Figure 3 refer to these and other fundamental principles and values that are applicable to all of the functions across the five tiers.
Another key principle is that various programs or settings can provide multiple functions and across multiple tiers. Coordination and continuity across functions are critical to ensuring the system works for the person and his or her family. Especially important in this regard are: (a) the development of linkages to facilitate service integration (e.g., case management) and (b) the application of the concept of ‘graduated integration’ (i.e., gauging the level of integration of services according to the severity of the individual case). **Service integration** is distinct from **system integration**, the latter referring to the regional and provincial/territorial structures and processes that provide the infrastructure for the organization and delivery of integrated clinical and psychosocial services. These are represented by the ‘System Supports’ section at the bottom of Figure 3 and provide the foundation for all service delivery within and across the five tiers; for example, policy funding, leadership, and performance measurement systems.

In summary, the tiered framework as developed in Ontario, and adapted from earlier national and international iterations, was intended as a planning tool to guide the development and implementation of an integrated system of service functions for mental health, substance use and gambling problems. It incorporated a distinction between service-level integration and system-level integration and described a broader vision of a comprehensive, integrated system based on a tiered framework that aligned service functions with the level of severity in the population. It was based on a population health approach that also included increased emphasis on health promotion, prevention, early intervention, and reduction of stigma and discrimination.

### 1.2 Reconciling the Tiered Framework and the Continuum of Care Approach

An obvious assumption underlying the tiered framework, or any such planning model for substance use services, is that treatment “works”, that is to say it accrues positive benefits to the people being treated, their families and social networks, and the community as a whole. This assumption is unequivocally supported by research evidence (e.g., Martin & Rehm, in press; Rush, 2012; Lev-Ran et al., in press) including that concerning the return on investment in economic terms (California Department of Alcohol and Drug Programs, 2008). Treatment research questions in this body of research now focus on who does best with what treatment options (i.e. interventions, levels of care) and include studying the importance of treatment environment,
engagement strategies, therapeutic relationship and the role of client-level factors such as problem severity/complexity and readiness to change.

Building upon this evidence base for treatment effectiveness, are the tiered framework and the continuum-of-care model compatible with each other as frameworks for service planning? Such reconciliation is necessary since the latter still underpins the planning of substance use services in Canada and elsewhere, while the tiered framework brings additional advantages for planning reconciliation. The answer is “yes” but this reconciliation requires further refinement of the thinking behind the tiered framework, including the Ontario version. One starts from the premise that, first and foremost, the tiered framework represents the levels of severity, or perhaps more precisely, the levels of risks and harms related to substance use as distributed in the general population. Given that, one can then consider the tiers as a collection of functions that are required in comprehensive treatment systems in order to ameliorate severity or, more precisely, minimize the levels of risks and harms of people in these tiers. While this was the intention in the Ontario model, the definition of functions was still mixed with service delivery settings, and many of these settings were typically aligned with the older continuum-of-care model. This still confuses functions and settings. More clarity in these definitions is needed in order to better align a needs-based planning model with the continuum-of-care model.

Figure 4 shows, at a conceptual level, the relationship between the tiers as defined by risks and harms in the general population, and functions to be delivered in a comprehensive treatment system. We build upon these functions in a subsequent section and, at this point, name these tiers and functions for illustration purposes only. Two points are critical. The first is that for purposes of system planning, the populations needing each of these core functions in the treatment system are “nested”. For example, the prevention and health promotion function should be delivered to people in ALL the tiers; early intervention for those in tiers 2 and up; and so on to tier 5, such that this group for tier 5 is the only one needing treatment functions aimed at severe health and mental health co-morbidity. This nesting of functions has significant implications for staffing and other resource requirements and, therefore, the costs of services to deliver these functions.
The second key consideration in reconciling the tiered framework and the continuum-of-care is that there are many service delivery models or settings that can provide these various functions to the appropriate target population in the tiers. The traditional continuum-of-care approach was based a set of service delivery models, variously defined as outpatient treatment, intensive outpatient or day/evening treatment and residential treatment; the ASAM model of treatment matching and client placement being a good example. These characterizations of treatment settings and their precise label and definition are inherently culture and context dependent. That said, and precise definitions aside, the various types of treatment settings within a treatment system can and typically do deliver more than one core function aimed at multiple populations based on level of risk and harm/severity. A residential treatment centre may, for example, co-locate a counseling staff in an emergency room of a general hospital and thus provide both

---

6 We would like to acknowledge David Brown on our national Project Advisory Committee for contributing this framework to the project.
counseling and other structured interventions for substance abuse and dependency, as well as outreach and early intervention. They may also provide a needle exchange service, as well as safe sex education aimed at HIV-AIDS prevention. Another example is a primary care physician who not only proactively screens patients for high risk substance use and related problems but also provide brief intervention to individuals at low risk; ongoing counseling to those with substance abuse or dependence; medication management and other support for home-based withdrawal management for those needing this level of care, and medication management and counseling for mild-to-moderate co-occurring depressive disorders. Clearly it is inappropriate to “place” residential treatment services, or well-trained and experienced primary care physicians in a particular tier; but rather we need to consider the core, multi-level functions that they provide to people experiencing particular levels of risk and harms.

Thirdly, the continuum-of-care as traditionally conceptualized by treatment settings is roughly aligned with functions that are targeted at increasing levels of severity or risks and harms. Conventional wisdom in the field holds that individuals experiencing higher levels of risk and harm and more complex substance use-related problems will have better outcomes in residential treatment settings compared to non-residential settings. Similarly, conventional practice wisdom maintains that the same holds true for non-residential settings that vary in duration and intensity of interventions and program structure; the more intense programs such as day/evening programs being more effective for those with a higher degree of severity and complexity than non-residential services where the client attends weekly or bi-weekly appointments. Referral criteria for the more intensive day/evening and residential services typically include severity of dependence, social stability including homelessness, environmental risk for relapse (i.e., heavy alcohol or drug use in the home or immediate social network), and mental health co-morbidity including suicide risk. While this conventional practice wisdom regarding the so-called matching criteria is challenged by considerable research that fails to pinpoint the critical matching characteristics, it remains a strong enough assumption to form the basis of the widely used ASAM criteria, including their use in managed care and insurance related purposes in the US (Gastfriend, 2003).
**Brief interventions:** This discussion of the research evidence underlying evidence-based client placement along the continuum of care is now further complicated by the inclusion, in this continuum, of very brief interventions delivered in primary care or other medical/non-medical settings. Brief “interventions” are typically defined as one to four, short 15 to 20 minute sessions for non-treatment seeking individuals, and which incorporate advice, motivational interviewing and counseling (McQueen et al, 2011). Recently, brief intervention (BI) has been supplemented with a component related to referral to treatment, thus giving rise to the now popular acronym SBIRT. Recent work extends the positive findings on SBIRT to drug use/abuse other than alcohol (Madras et al, 2009).

There is a wealth of evidence pertaining to the effectiveness of BI or SBIRT in primary care setting, medical wards and other hospital settings such as trauma clinics and emergency departments (McQueen et al 2011; Kaner et al., 2009; Bien et al., 1993; Cherpitel et al., 2010; Madras et al, 2009). Of particular interest in the present discourse is that those brief interventions can be effective not only for people with mild to moderate substance-related problems, but also for those with more serious problems including dependence and other complex conditions (Field & Caetano, 2010; Cobain et al., 2011). Some studies report better outcomes from brief interventions for people with more severe compared to less severe substance-related problems (Field & Caetano, 2010), a finding sometimes reported in studies of clients in specialized alcohol treatment settings (See Ashton, 1999, in his analysis and critique of the well-known Project MATCH). More research is needed on who benefits most from brief interventions delivered outside substance use treatment settings by trained health care professionals, especially with longer term follow-up and drug abusing populations well represented (Field et al., 2010). The existing data suggests that (a) brief intervention (BI or SBIRT) should be formally considered as part of the community’s continuum of care, and (b) they are not necessarily targeted only at people experiencing mild to moderate levels of risk and harm/severity.

**Computer and Mobile-Based Services and Supports:** Even with the addition of brief intervention services to the traditional continuum-of-care, there is another “new kid on the block” in the provision of substance use services and supports; namely those based on Internet and mobile phone technology. There are several ways in which Internet and mobile
telecommunications are being used to assist people with health problems, including substance use and mental health problems, and the evidence base around these applications is advancing. As yet, there is no widely accepted categorization of these applications, but the following broad grouping may be helpful in a needs-based planning context:

- Mobile telecommunications, in particular text-messaging (SMS),
- Internet-based applications, including websites that can contain health information, provide self-completed or professional-assisted screening and assessment tools, as well as structured interventions.

The kinds of services and supports that can be offered include:

- Unassisted access to health information (e.g., a website or portal to other websites)
- Self-completed screening or diagnostic tests, or structured interventions, such as CBT, with automated feedback
- Therapist-assisted counseling (e.g., questions may be posted and a professional responds confidentially, sometimes called e-counselling
- Chat lines, open forums or social networking (e.g., Facebook, Twitter) for mutual aid support or sharing of information with or without therapist mediation
- Text messaging or emailing to deliver health related messages, encourage adherence to interventions being delivered by traditional means, provide follow-up support, or obtain evaluation feedback.
- Mixed methods, for example, using text messaging in conjunction with a manual, diaries, brief telephone supporter and/or weekly counseling appointments.

It is beyond the scope of the present summary to review the rapidly expanding literature on the use of Internet and mobile communication technologies for prevention, health promotion and health care, including mental health and addictions (see for example Cole-Lewis & Kershaw, 2010; Chou et al., 2009; Budman, 2000; Boulos et al., 2011; Bjerke et al, 2008; Bewick et al, 2008; Andrew et al, 2010; Cunningham & Van Mierlo, 2009; Cunningham et al, 2010; Fjeldsoe et al., 2009; Gold et al., 2011; Koski-Jannes et al., 2007; Robinson et al., 2006; Selby et al., 2010; Shapiro
et al., 2010; Wood & Wood, 2009). Overall, the results are sufficiently encouraging to warrant formal consideration of Internet and mobile technology in the context of needs-based planning and expanding views of the continuum-of-care.

Given the above discourse, the concept of the continuum-of-care based on selected service categories that are matched roughly to problem severity remains valid for the purposes of needs-based planning in the Canadian context. However, the situation is more complex with the inclusion of brief intervention and interventions delivered by Internet/mobile technology which can be effective across a wide range of severity. Further, the added advantage of the tiered framework for system planning is that it compels one to consider the role of ALL human service sectors that can organize the delivery of the core system functions in various treatment settings (i.e. levels of care) in order to cover all members of the general population organized by severity, risks and harms. In short, the tiered framework expands the thinking and planning with the continuum-of-care by defining, planning, delivering and evaluating this continuum well beyond the traditional specialized sector, and essentially making substance use services and supports everyone’s business.

Figure 5: Reconciling the tiered framework and the continuum of care.
1.3 Going from Tiered Frameworks to Needs-based Planning

Specialized substance use services and supports have traditionally been funded without a comprehensive systems-level, needs-based planning model to help allocate resources by service type and target population, and according to population needs. Annual funding for treatment programs has largely been driven by the budget allocation from previous years with the result that gaps or imbalances in services relative to actual population needs are perpetuated over time. Typically, new resources for substance use treatment become available as a result of new, periodic government strategies or targeted funding opportunities (e.g., services for youth, homeless, people with co-occurring disorders). However, there are many factors that underlie funding decisions – local advocacy efforts for example – and funds may not be allocated equitably within a jurisdiction on the basis of population needs. In Canada, there is evidence of a substantial gap between the need for substance use services and current availability (National Treatment Strategy Working Group, 2008). However, due to a lack of comprehensive and comparable substance use treatment information systems and population-level data, the exact size and nature of this gap is unknown across Canada as a whole, and within specific Canadian jurisdictions.

Adding to this challenge is the fact that planning efforts to date for substance use services and supports in Canada have been largely focused on the specialized sector of services and have not embraced the broader systems approach articulated in the 1990 Institute of Medicine report, or the more recent tiered frameworks described above. The need for a broader systems approach to treatment related information systems and planning models was recognized in the Systems Approach report (National Treatment Strategy Working Group, 2008). Among the recommendations was a call to “…establish a process for reporting and sharing data on the capacity and use of services and supports based on the [NTS] tiered model…” (pg. 32). As a first step, the National Treatment Indicators Working Group was convened in 2009, under the leadership of the Canadian Centre on Substance Abuse (CCSA), to develop national indicators of treatment utilization. This began with a short list of data elements commonly collected by Canadian jurisdictions on client characteristics and services provided. There is also an effort to align these indicators to the extent possible with indicators from other jurisdictions, such as the US, Europe, and Australia. Although beginning with the specialized sector of substance use
services, the goal of the Canadian project is to develop the capacity to collect and report information across the broader system of services and supports for substance use as advocated by the tiered model. The National Treatment Indicators Working Group is now serving as an advisory body to CCSA and to the National Treatment Strategy Leadership Team in the initiation, implementation, and further development of national treatment indicators focused on service utilization, and to support Health Canada in international reporting relating to services and supports for substance use. The Working group has recently released its first report and is available at www.nts-snt.ca/2012%20Document%20Library/2012_nts_National_Treatment_Indicators_en.pdf

With a process in place to develop the national picture regarding treatment service utilization and current capacity, a second component was required that would estimate population-based service delivery requirements. With capacity requirements in hand (i.e., need), as well as information on the current capacity (i.e. supply), one would have the basis for a population-level, needs-based gap analysis to inform resource allocation efforts (see Figure 6). This could eventually be supplemented by one more component, namely the population-level impact of local/regional treatment systems that vary in capacity and configuration. Impacts would include substance use related morbidity, mortality, justice-related indicators (e.g., DUI), and prevention indicators such as lower per capita consumption of alcohol and other drugs (Babor et al, 2008). With these three components in place (utilization, need and outcome) one would have the ingredients of a comprehensive systems-level outcomes management system akin to what is feasible at the clinical level (Toche-Manley et al., 2011). In the present project we focus on Component 2 – estimating service requirements based on population needs.

Figure 6: Schematic representation of population-based gap analysis

Estimates of current service utilization (demand and current capacity (supply)) [minus] Estimates of population-based service requirements (need) = Estimates of population based unmet need (gap)
1.3.1 Needs-based planning models

Rush (1990) published a needs-based planning model focused exclusively on specialized alcohol use services and supports in Ontario and it followed four steps:

1. **Determine the geographic area and size of the population served.** The model was developed to estimate the required capacity of treatment services for people aged 15 and over. At the time, the regional health planning districts in Ontario (n=40) were the focus of the treatment projections, although any aggregate of these districts was seen as appropriate.

2. **Estimate the number of people with substance use problems/disorders within each population unit, referred to as the “in-need” population.** The focus at the time was exclusively on alcohol and a broad, non-diagnostic perspective on alcohol problems. The prevalence estimation method was based on alcohol sales data and estimated per capita consumption in each jurisdiction, and using a cut-off of high risk drinking at 35 standard drinks or more per week (approximately 475 grams or more of absolute alcohol). This estimation method, and the exclusion of drugs other than alcohol, was due to the lack of other options, in particular methods based on population survey data.

3. **Estimate the number of individuals from step two that should be planned for and treated in a given year.** An earlier attempt at a needs-based planning model (Ford, 1985) estimated that the proportion of the in-need population that should be planned for on an annual basis was 20%. This can be referred to as the “demand” population. This was an estimate based on relapse rates following treatment, incidence rates of alcohol dependence, and the goal to ensure that the treated rate would at least exceed the combined impact of recidivism and incidence (i.e., over time penetrate and reduce the in-need population). Survey data were also examined on the proportion of the in-need population that are likely to seek help from the specialized sector of substance use services and a range of values for the demand population was subsequently proposed – 5%, 10% or 15%. In the model’s application, this estimate could be adjusted locally based, for example, on the nature and scope local case-finding activity and accessibility of local substance use services.
4. **Estimate the number of individuals from step three that will require service from each component of the specialized treatment system.** What was required at this stage was a breakdown of the continuum-of-care (specialized alcohol services only) into component parts (assessment/referral, detoxification, case management, outpatient treatment, day treatment, short and long term residential treatment, and aftercare) and specification of the “ideal” pathways between them. This stage drew heavily on published research on patient characteristics and treatment matching, the cost-effectiveness of various treatment settings, and rates of treatment completion. The treatment system, and the flow within it, was modeled in a conceptual diagram and then statistical parameters estimated at various junction points. The final yield was an estimate of the number of individuals requiring service in each component of the continuum-of-care, in each planning jurisdiction and for the province of Ontario as a whole. A range of low, medium and high estimates was derived from changing the assumptions for help-seeking (5, 10, or 15%).

This forecasting model was used extensively in local jurisdictions in Ontario as a planning tool but never became enshrined in Ontario addictions services policy as a funding formula. It did, however, become a formal component of funding processes in other parts of Canada, most notably British Columbia, Alberta and Quebec\(^7\). Two international applications are particularly noteworthy. In Australia, the model was used extensively and extended to incorporate a fifth step that estimated the actual resource requirements for trained FTE equivalents within each type of treatment setting. To replicate this important advancement requires critical assumptions and specification of the actual intervention models to be deployed within the various settings, for example, the desired duration of initial screening and assessment protocols; the relative use of group versus individual approaches to delivering interventions; and the ideal duration of day/ evening and residential treatment programs.

In Birmingham UK, David Best and colleagues extended the Rush forecasting model using a tiered framework and estimated in some detail the optimal linkage between the specialized substance use sector and the criminal justice system. The Birmingham team also incorporated

\(^7\) The model remains in use today in Quebec
feedback loops derived from documented client trajectories across tiers and used routinely collected outcome monitoring data to re-calibrate the parameters of the forecasting model over time based on the outcomes of clients in the treatment settings to which they were matched. In the end, therefore, the ultimate test of the validity of the model was based on the outcomes achieved by clients and he achieved a system of calibration like that described at the program/clinical level vis a vis outcomes-based management (Toche-Manley et al., 2011).

1.3.2 Extending the 1990 “Rush Model” to the full tiered framework

The present project aims to update the 1990 “Rush model”, then developed for the specialized sector of alcohol use services. Major areas for enhancement include: incorporation of drugs other than alcohol; estimation of population-level needs with population survey data; a broader view of the treatment system based on the tiered framework; and an updated continuum-of-care.

The project has been funded through the Drug Treatment Funding Program (DTFP); a program of the National Anti-Drug Strategy (http://www.nationalantidrug-strategy.gc.ca/) and administered through Health Canada. The funding period for the project is April 1, 2010 to March 31, 2013, and the project is being implemented through the Centre for Addiction and Mental Health (http://www.camh.net/). In addition to the project team located at CAMH and the Université de Québec (Dr. Joël Tremblay), the project is supported by a national Advisory Committee comprised of treatment system experts and other key stakeholders from across Canada. This includes representatives from British Columbia, Alberta and Québec; jurisdictions which had been significant users of the 1990 model for treatment system planning. Also included are representatives at the policy as well as clinical levels, and evaluation experts in substance use systems (see Appendix A for Advisory Committee membership). The project also includes an international Expert Advisory Panel.

1.3.3 Project Objectives

The main questions of interest in this project are: “What is the level of need in the Canadian population for substance use services and supports and what are the capacity
requirements to address this need?” The first practical goal of this project is to estimate the number of people requiring services from each component of the system organized in relationship to problem severity (acuity, chronicity and complexity) according to the tiered framework. A subsequent phase of the project will then turn these capacity requirements, expressed as the required number of individuals to be treated, into service delivery requirements (e.g., number of beds, trained counselors for community services treatment; day/evening treatment slots). Consideration will also be given to the competencies required to implement evidence-based practices in these treatment settings.

It is expected that the results of this research and development process will be useful for three purposes:

- System-level planning and resource allocation so as to achieve more equitable resource distribution and maximum population impact with available resources;
- Monitoring and trending key features of treatment system design (i.e., inputs) as part of broader evaluation and performance measurement frameworks;
- Advocating for additional resources to address identified gaps.

A program logic model for the project was developed to align with the outcomes expected for the DTFP program nationally (see Appendix B). The anticipated outcomes for the project in the immediate and intermediate terms include:

- Increased access to models and toolkits for needs-based planning and allocating resources for substance use services and supports;
- Increased awareness of decision-makers across Canada of needs-based planning models and their relative advantage over existing approaches;
- Enhanced provincial/territorial (P/T) commitments to affect system change in DTFP treatment systems’ investment areas using needs-based planning models.

Longer-term outcomes include:

- Across Canadian jurisdictions, increased use of needs-based planning models for substance use services and systems;
- Increased ability to systematically allocate resources to better meet needs of individuals accessing services in all relevant health sectors;
- Improved decisions for resource allocation for substance use services and systems;
• Increased PT capacity to plan and evaluate substance use treatment systems’ capacity and performance; and

• Strengthened evidence-informed substance use treatment systems including:
  
  o **System-level outcomes** such as a more balanced continuum of services (e.g., residential/community services), improved continuity of care, increased penetration to in-need populations, and improved population health outcomes;
  
  o **Client-level outcomes** such as reduced harms associated with substance use and improved outcomes related to health and quality of life.

1.3.4 Assumptions Underlying Model Development

1. Substance use “problems” vary along a continuum of severity comprised of risks, harms and complexity. Substance use related problems exact a high cost to society. In addition to the individual level care, it is desirable to reduce the level of substance use related problems and their cost at a population level.

2. People experiencing these substance use related problems benefit from assistance in managing these problems. The benefit to individuals, and society as a whole, of providing assistance through public resources outweigh the cost.

3. Many options exist to provide assistance and there is value in providing a range of options in the community and organizing them in such a way that the most costly of these options are aimed at those people who need them and will benefit most from them.

4. Characteristics of people in the community can be described and summarized in such a way that reflects the need for different service options and the percentage of people at different levels of problem severity who will seek some form of assistance.

5. The nature and scope of prevention, health promotion, early intervention and stigma and discrimination programs in the community can influence help seeking behaviour and, therefore, the percentage of people in the community who will seek help.

6. A relatively small percentage of people who need assistance with substance use problems seek help from formal helping sources and professionals. Although informal support from family, friends, co-workers, etc. are also helpful, the current supply and mix of helping services and professionals is not sufficient to address the unmet needs in the community.

7. Unmet need can be met by adding new formal services or professionals to the system; adjusting the current mix of services or professionals and increasing the role of informal supports; and/or increasing efficiency through innovative strategies such as more efficient
screening and assessment, and effective use of the Internet and information technology. All these strategies may be needed to some degree, therefore calling for systematic, needs-based planning processes and models.

Needs-based planning processing and models will also need to be tailored to community context, for example, urban/rural/remote communities, and communities of different cultural context. Special sub-populations also need to be considered, for example women and youth.

8. Communities will benefit from guidelines on the nature and required capacity of different options for assisting people with substance use problems, as well as support in using these guidelines (e.g., consultation, advice, tool kits, and statistical data).

9. Use of these guidelines and supportive tools and processes will contribute to the design and implementation of a service delivery system better aligned with the needs of community members and more needs-based allocation of resources.

10. A needs-based system of services will be more effective and cost-effective than a system that develops over time on the basis of other factors (e.g., advocacy, political pressure, short term priorities). A more effective and cost-effective system of services will have an impact at the population-level on the nature and level of substance use problems in the community.

1.3.5 Evaluating Project Impact

In 2011, we performed a baseline survey of the current practices in planning and monitoring the performance of substance use services and supports across Canada at the local health region and the provincial/territorial (P/T) level. One objective was to determine what data and planning tools or processes were being used to identify gaps in the treatment system and ensure resources were being equitably allocated on the basis of community need. This survey found a high perceived need for better quality local data and more quantitatively oriented planning tools. Although it is not within the time frame and scope of the present project to evaluate the impact of the needs-based planning model, the baseline survey will allow for an assessment of its uptake and impact at a future date.
2.0 Defining Need

2.1 Conceptual and Measurement Issues

**Need:** There is no universal interpretation of the term “need” for community needs assessment purposes (Aoun et al., 2004). Needs can be defined in a variety of ways, for example, they can be recognized and unrecognized, private and public, short and long term, and can be seen from the perspective of a variety of groups such as individual, family, group, organization and community as well as client, program, provider network and regulatory bodies. “Needs” focus on the nature and scope of the problem and are distinct from “wants” which are expressed desires, for example, for help, for resources, etc. Demand refers to actual help seeking. “Supply” is related to availability, accessibility and acceptability. In an ideal situation, needs are balanced with wants, demand and supply.

Bradshaw distinguished between “felt need” (what people say they want or what they think their problems are that need addressing); “expressed need” that is demonstrated by peoples’ use of services; “normative need”, that is need determined by experts based on research or professional opinion, and “comparative need” whereby one person’s (or group’s) needs are evaluated in relation to the position of others (Bradshaw, 1994). In the substance use field, and mental health generally, all these types of needs have been investigated. Normative need has been commonly used in population survey approaches whereby formal diagnostic criteria are applied to responses in community surveys and respondents meeting criteria for one or more mental disorders (including substance use disorders) are considered to be in need of treatment. This was the approach adopted in the earliest psychiatric epidemiological surveys (Regier et al., 1984) and continues to be used in many reports intended to illustrate the “treatment gap” (e.g., Yacoubian, 2003; Cunningham & Blomqvist, 2006; Wang et al., 2005). “Met need” is assumed when these same people report use of services (although there are many variations of the specific questions asked), and “unmet need” or the treatment gap results when diagnostic criteria are met and services have not been accessed. See Kohn et al., (2004) for a synthesis of psychiatric epidemiological studies defining the treatment gap in this manner. Across 37 studies and 25 countries the percentage of people determined to be in need but not accessing services averaged 76.2%.
It is now widely accepted that “need” is a multi-dimensional construct and that normative need defined by diagnostic criteria alone is but one approach. Going beyond diagnostic criteria, investigators draw upon other constructs such as complexity/comorbidity, daily functioning, quality of life, and mental distress, although a normative judgment is still made regarding the need for treatment – it’s just done with a broader set of criteria and conditions than diagnosis alone.

Felt need, or more precisely the “perception of the need for care”, is a complex construct that is influenced by many factors; normative beliefs in the prevailing community and culture; lack of recognition of a “problem” or that the “problem” is related to substance use; lack of awareness that help is available or accessible; belief about the effectiveness of treatment; and feelings of embarrassment, fear or stigmatization concerning seeking help (Sareen et al., 2007; ten Have et al., 2010). In some instances, severe impairment may also result in lack of insight into the severity of their symptoms, for example, with individuals experiencing schizophrenia and abusing alcohol or other drugs. Some surveys have used a validated instrument on perceived need, the most common being the Perceived Need for Care Questionnaire developed for mental health survey work in Australia (Meadows et al., 2000; Henderson et al., 2000). One specific question posed to survey participants is: Have you ever felt that you needed help for emotions, mental health or alcohol drug use. One reason for the high interest in perceived need is because epidemiological surveys have consistently shown that, among those who meet diagnostic criteria for a mental disorder, including substance use disorders, a significant number also report that they do not need treatment. By the same token, many people who report needing services for emotional, mental or alcohol/drug problems do not meet criteria for mental or substance use disorders (Druss et al., 2007). Further, some may meet some diagnostic criteria but not the full set required for the diagnosis (referred to as sub-threshold cases). Many others may not meet any of the diagnostic criteria at all. Thus, “need for treatment” is not a construct that is really present or absent. It is a complex concept best conceptualized as a “series of overlapping constructs, including symptoms, disease burden, treatment effectiveness, and consumer perceptions” (Druss et al., 2007, pg. 1197).

Several studies using survey data on perceived need find that those who have other co-occurring conditions and higher severity of the condition in question, including substance abuse,
are more likely to perceive the need for treatment (e.g., Codony et al., 2009; Mojtabai et al., 2002). That said, many mild or moderate cases, variously defined, also report a perceived need for treatment. While many factors have been found to predict perceived need for mental health or substance use treatment (e.g., age, SES, cultural/ethnic background), the specific results depend on the population studied (for example, older adults, adolescents, men versus women). A major challenge in navigating this literature is that people with substance use disorders may not be separated in the analysis. It is more common for substance use disorders/problems to be included as one of several mental disorders/problems (e.g., Henderson et al., 2000; Andrews et al., 2001), or omitted from the study analysis altogether (e.g., Brugha et al., 2004). Studies that separate perceived need for mental and emotional problems from alcohol and other drug problems are rare and have been done almost exclusively in the United States. There are, however, a few studies that have made this important distinction (e.g., Stockdale et al, 2006), or focus on substance abuse exclusively (Shephard et al., 2005; Proudfoot & Teesson, 2002; Huang et al., 2006; Teesson et al., 2006; Wu, 2010).

In sum, the need for substance use treatment can be defined normatively with diagnostic or other criteria and/or by self-report of perceived need. It follows then that the level of “unmet need” varies with the threshold of severity used to define need for care and the precise questions that are posed about perceived need. To paraphrase Mechanic (2003), the crux of the matter is not the operational definition of need per se but rather to find a definition that clinicians, decision-makers, researchers and perhaps even the public can agree on as a credible concept.

**Treatment Outcome and Natural Recovery:** A fundamental premise underlying needs-based planning is that treatment through formal publicly-funded treatment services is required for the recovery and improvement or substance use problems. Although the assumption that “treatment works” is well-supported in the treatment literature (Martin & Rehm, in press; Rush, 2012; Lev-Ran et al., in press) it does raise questions about the difference between transient need and persistent need, a distinction that requires longitudinal panel data to fully explicate (Stockdale et al., 2006). When a person is identified with a perceived or normative need at one point in time but not at a subsequent time, and without intervening service use, it is defined as transient need. In the study by Stockdale et al. (2006) on mental health and addiction about 40 to 60% of those
with Time 1 need was “transient” three years later. However, for more than half of respondents with Wave 1 probable clinical need, this need persisted over time. Interestingly, about 40% of those with no perceived or “probable clinical need” at Time 1 received some form of care (monitoring, assessment, or treatment in Wave 1, Wave 2, or both).

In the substance use field transient need is at the heart of the concept of “natural recovery” (essentially remission of substance abuse or dependence without intervention). Some argue that this needs to be carefully considered in forecasting the need for treatment services, essentially downplaying the role of formal treatment and yielding much more conservative estimates of required treatment capacity. Others argue that all forms of intervention influence the individual to some degree and help move him/her further along their (natural) recovery pathway (Edwards, 2000). Ultimately, it comes down to the person’s own internal processes and there is no clear way to clearly demarcate the relative influence of personal reflection, informal supports and encouragement, formal coercion or social control, and formal treatment advice or structured interventions. From the perspective of tiered frameworks, these natural informal supports are included as a legitimate part of the treatment system and for that reason formal estimates of the prevalence “natural recovery” are not defined and factored into the service capacity requirements.

**Service Use:** Other studies have focused on service use as the outcome of interest in the analysis and find that, at the individual level, it is strongly predicted by perceptions of need as well as co-occurring conditions and problem severity Vasiliadis et al., 2009; Mojtabai, 2009; Rockett et al., 2005; Burgess et al., 2009; Jacobi et al., 2004). As with studies on perceived need, many survey respondents with mild or moderate cases, variously defined, also report using services. Further, the individual or contextual predictors of service use depend on the population studied as well as the way service use is broken down in the survey items or in the analysis (e.g., formal versus informal, specialized substance use services versus generalist services such as primary care physicians). Many studies identify important mediating and moderating factors, for example, substance abuse mediating the relationship between mental health and service use (Maulik et al., 2010), and involvement in the criminal justice system predicting higher likelihood of receiving services for severe mental illness (McAlpine & Mechanic, 2000). Service availability is also an
important mediating variable (Kovess-Masfety et al., 2007), as are several demographic characteristics (e.g., Tempier et al., 2009; Schmidt et al., 2007) and psychosocial challenges such as interpartner violence (Lipsky & Caetano, 2008). Importantly, different moderators and mediators can emerge from the analysis of service utilization depending on how service use is modeled in the analysis (e.g., yes/no versus scaled intensity or continued use) (Elhai & Ford, 2007).

The question “what percentage of people with substance use problems actually seek help?” has been tackled by many researchers around the world including Canada. It is very challenging to synthesize the results of this large body of research into a single number or even a small range given varying definitions of seeking help (e.g., specialized versus non-specialist substance use services) and substance use problems (e.g., alcohol versus or including other drugs; dependent versus or including abuse/problems), and varying time frames for reporting (e.g., past year or lifetime). Results may also be jurisdiction-specific, depending on the prevailing mores about seeking help, existence of anti-stigma and discrimination programs, intensity of screening and case-finding initiatives, insurance payment requirements, for example. The wording of the survey question also complicates matters with some surveys asking about seeking help for substance use concerns (the precise wording varies), and others ask about seeking help for substance use, mental health or emotional concerns (that is not responding only for substance use).

Pending the results of a systematic synthesis of this literature, that we currently have underway, the available data can be summarized as follows: the percentage of people with past-year substance use related problems, including the full spectrum of abuse to dependence, who seek help from specialized substance use programs in the past year is very low in the range of 5-10%. If we can extend the options to include a wide range of generic services such as primary care, mental health, social services, a priest/rabbi, then percentages increase to around 15-20%. If the analysis includes this broad range of alternative sources of help, but is focused only on people with indicators of severe and complex needs, the percentage is in the range of 30-40%. Thus, however the extant data are categorized and analyzed, only a minority of people with clearly defined needs are accessing professional helping agents in their community.
Time frame: Consideration of the time element also requires consideration of the relative value of lifetime versus 12-month data on symptoms/diagnosis, related impairments, perceived need for care and service use. Generally when assessing perceived need or use of services, 12-month data are preferred over lifetime data, if for no other reason than to minimize recall bias. In contrast, other experts in this area feel that it is better to document lifetime disorders and co-morbidities when using this information to predict service use. Kessler and colleagues (2001) have shown that there is often a significant lag between the onset of need as defined by diagnosis or sub-threshold diagnosis, and subsequent service use. In Kessler’s analysis, depending on the country providing data, 50% to 85% of people needing treatment eventually seek treatment based on lifetime data. Use of 12-month data for both need and service use would have yielded considerably lower estimates of treatment demand and, therefore, service requirements. That said, 12-month are considerably more relevant for annualized budgeting and service planning.

Community-level factors: Various conceptual models have been advanced to help understand need and consider its role in predicting service use. The Anderson model is the most commonly used and it distinguishes between need variables (e.g., diagnostic criteria, severity, perceived need), predisposing variables (e.g., gender, age, SES), and enabling variables (e.g., social and family supports). Although this model has been criticized for its inability to “explain” service utilization with a high degree of statistical accuracy, it does provide a useful framework to organize one’s thinking and to encourage reflection on the multiple factors that underlie a decision to seek treatment. Importantly, the Anderson model points one to both individual-level factors (e.g., gender, SES) as well as community-level contextual factors, such as the proportion of the population with insurance coverage, policy that may restrict access, accessibility of services, and prevailing cultural norms regarding professional versus traditional, alternative forms of healing. In short, service use has causal influences at both the individual and community levels, making it a challenge to measure with either survey data or community-type indicators alone. This can, however, be accomplished with fairly sophisticated multi-level statistical models (Diaz-Granados et al., 2010); an approach not yet applied in substance use services research.

Age Considerations: The usual interpretation of the “population” for purposes of estimating needs for substance use services includes all people living in a particular jurisdiction.
irrespective of age. In many respects, this is the optimal interpretation since it allows for consideration of the life course trajectories of problematic substance use and co-occurring conditions – trajectories that often begin in early childhood – as well as trajectories of service utilization, again often beginning in early adolescence, if not before. The practical reality, however, is that health and social services, including mental health and substance use services and supports, are often funded through departments of government with specific age mandates and each with their own needs assessment and decision-making processes. Although this separation is often cited as a major challenge to continuity-of-care from adolescence to young adulthood, separate funding silos are entrenched in Canadian jurisdictions, and undoubtedly the majority of other countries. Although there is flexibility in some jurisdictions depending on the individual case seeking help, the usual cut-off for access to children and youth services is 16 years of age. Another reality that motivates the choice of age ranges for needs-based planning is the availability of survey data upon which to estimate normative and perceived need as well as service use. The best source of Canadian survey data on needs for mental health and substance use services (the 2002 CCHS 1.2 survey) included respondents age 15 and over, for example. Accordingly, for the present project we focus on ages 15 and over.

**Geographic Boundaries:** For needs assessment purposes, another practical aspect of needs assessment concerns the geographic region for which service capacity requirements are to be developed. Inter-provincial differences in need and use of services for mental and/or substance use problems have been documented in most of the provinces and territories in Canada (Afifi, 2005). However, health service planning now occurs at a sub-provincial level in many of the provinces and territories (i.e., the level of health authority) and a recent study showed important differences in mental health service use that were associated with both individual and regional characteristics at that geographic level (Diaz-Granados et al., 2010). For the present project, we undertook a baseline survey of current planning processes and tools at the local planning region level across Canada and established the geographic and jurisdictional boundaries of these planning regions for the purposes of needs-based planning (Health Systems and Health Equity Research Group, 2011).
2.2 A Feasible Measurement Model for Needs-Based Planning in Canada

The 2002 Canadian Community Health Survey (CCHS) 1.2 questioned over 36,000 Canadians about mental health and substance use issues (Statistics Canada, 2002). This comprehensive survey used a sampling frame that represented the general Canadian population aged 15 and over, but with several important exclusions to be discussed in more detail later (e.g., people who are homeless, First Nations reserve populations, institutionalized people). As a starting point, the data from this survey were used in the present project to develop estimates of the in-need population.

We used the CCHS 1.2 survey data to estimate the number of people in each of the five tiers of the tiered framework needing substance use treatment. Our goal was to develop these estimates for each of the identified planning regions in the country, drawing upon our baseline survey of these planning regions and the literature reviewed above, while recognizing and documenting the limitations in these survey data. We summarize these limitations in a subsequent section, some of which can be addressed in future attempts to improve the needs estimation model, as well as the survey items themselves. Notably, some of the relevant questions in the survey have already been revised for our purposes for the next iteration of this Canadian mental health survey.

Descriptive statistics on the survey data available for public use were run on a large number of variables to familiarize the project team with the data. There were many variables considered as possible indicators of need. Our list of variables for the initial exploratory analysis included:

- distress scale (K10)
- physical health rating
- mental health rating
- life satisfaction rating
- measures of two week disability
- alcohol/drug interference flags

---

8 Flags were based on pre-established cut-off points on the interference scales
• alcohol/drug problems and dependence
• total number of mental disorders\(^9\)
• interference from mental disorders
• 12 month utilization of any services
• chronic health conditions causing restrictions

Correlations were generally weak to moderate (.25 to .45). Since the sample size was very large, even small correlations were found to be statistically significant. As one would expect, many of the indicators of problem severity were correlated with the measures of service utilization.

An important consideration is that we are producing estimates for local planning areas using national survey data. The CCHS was designed to produce national estimates with some, but not all, provinces adding to the sample size for their jurisdiction. We accounted for the age and sex distribution of each local area by calculating percentages of people in each need category (tier) by age and sex. However, national estimates of need may not accurately reflect local needs with absolute precision – one expects important regional variations. The percentage of local residents within age groups in each of the five need categories may also vary markedly between regions. At the same time, using local health regional data to make more precise projections was not feasible due to a lack of identifying information in the CCHS public data file, as well as the small sample sizes in many regions. In another iteration of the model, it may be possible to refine estimates for local planning areas based on local data that might be available and incorporated into more sophisticated multi-level statistical modeling procedures (Diaz-Granados et al., 2010).

**Need Categories**

The aim was to create categories that were logical, agreed with present theoretical and clinical knowledge, and might be useful in separating groups of people according to their need for services as per the tiered framework. As described earlier we conceptualized the tiered framework as being stratified by problem severity rather than treatment sectors, services or settings *per se*.

---

\(^9\) A subset of mood and anxiety disorders were included; psychotic disorders and personality disorders were notable exceptions from the perspective of the goals of the present project.
Our approach was to develop definitions of need within each tier that most treatment system planners and clinicians could identify with for planning purposes – an approach that is partly based on practicality and face validity. This categorization gave us mutually exclusive categories – each person was classified into only one category. The categories conform to a population pyramid, such that there were fewer people in each category than in the one below it, and the need for more intensive treatment and support functions was considered to increase for people in the higher compared to lower tiers.

The categories are described below\textsuperscript{10}:

\textit{Category 1}

These respondents were abstainers and light to moderate drinkers or drug users. These are people who need no treatment interventions per se, but rather, primary prevention through health promotion, and exposure to reduced stigma and discrimination programs.

\textit{Category 2}

These respondents were heavy/binge drinkers or heavy drug users who reported few problems related to their substance use and did not meet the DSM criteria for alcohol or drug dependence.

\textit{Category 3}

These respondents experienced four or more substance use related problems OR met the criteria for substance abuse or dependence.

\textit{Category 4}

These respondents experienced several substance use related problems or met the criteria for substance abuse or dependence AND:

1. had a positive response to the question "During the past 12 months, was there ever a time when you felt that you needed help for your emotions, mental health or use of alcohol or drugs but didn't receive it?" OR
2. utilized formal health services because of mental health or substance use issues within the past 12 months OR

\textsuperscript{10}Category definitions and CCHS 1.2 variables can be found in Appendix C. Precise code based on the SPSS analysis can be found in Appendix M, bound separately.
3. showed significant interference in some aspect of their lives from their drug or alcohol use as indicated by the flag variables for alcohol or drug interference (at least 4 out of 10 on any of the 5 interference questions for each of drugs and alcohol).

**Category 5**

Respondents in this top category were judged to be in need of specialized and intensive medical/psychiatric service functions. People placed in this category met all the criteria of Category 4 **AND** the criteria listed below:

1. met the DSM criteria for 2 or more (of five) mental diagnoses (major depression, manic episode, panic, social phobia, agoraphobia without panic) and;
2. had 1 or more mental disorders with significant interference (using the mental health interference flag variable) for at least one of these disorders and;
3. had a physical or mental condition that reduced ability sometimes/often in 1 of 4 areas (home, work, school, leisure).

The definitions of severity categories were applied to the national dataset using SPSS (version 15.0). Individual standardized weights supplied in the CCHS dataset were used to weight the data. Figure 7 shows the distribution of the five categories for Canada as a whole.

**Figure 7: Distribution of the Canadian population across the five severity categories (tiers).**
The percentage of people that would fall into each severity category by age and sex was calculated for the entire national sample and projected for local planning tables. This resulted in a total of three tables for each local health planning region (male, female and total), as well as for each province/territory as a whole. We also report the data in four age categories: 15-19, 20-24, 25-59, and 60+. (See Appendix M, bound separately).

Statistics Canada 2010 census data estimates were used to obtain the populations by age and sex in each of the local health planning regions in Canada. The age- and sex-specific weighted percentages in the five tiers were applied to each of the planning areas to obtain the local estimates of the number of people in each category. Resulting tables corresponded to the latest local health planning regions wherever possible. However, as these health planning regions are continually being revised, there may be some discrepancies between the most recent geographic breakdowns and the ones we utilized. Ultimately, health area groupings were chosen to correspond to the planning areas used in our baseline survey of needs-based planning for substance use services and supports in Canada (Health Systems and Health Equity Research Group, 2011).

Example – Applying the Model to a Local Health Region

For illustrative purposes, we have chosen to use the Champlain Local Health Integration Network (LHIN) geographic health planning area in Ontario.

**Geographic Health Planning Area:** Champlain LHIN, Ontario

**Total population:** 1,044,481 people (aged 15 and over) (2010 Census estimates)

**The In-Need Population Table:** Table 1 shows the estimated total (e.g., male and female combined) for the ‘in need population’ ages 15 and over for the Champlain LHIN, broken down by four age categories, 15-19, 20-24, 25-59 and over 60.

The numbers were derived from 2010 Canadian population estimates and the CCHS 1.2 as described above, and yield estimates of how the population within the region can be distributed across each of the five need categories. Reviewing the total collapsed across five need categories...
and across all age categories (shaded bottom row) yielded estimates of 80.6%, 10.4%, 6.2%, 2.6%, and 0.2% of the total population aged 15 and over, across Tiers 1–5, respectively.

Table 1: Population Pyramid Table

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Need Categories</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
<td>5</td>
<td>Total</td>
</tr>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15-19</td>
<td>58230</td>
<td>10811</td>
<td>7230</td>
<td>4921</td>
<td>140</td>
<td>81332</td>
</tr>
<tr>
<td>%s</td>
<td>71.6</td>
<td>13.3</td>
<td>8.9</td>
<td>6.1</td>
<td>0.2</td>
<td>100</td>
</tr>
<tr>
<td>20-24</td>
<td>50652</td>
<td>15454</td>
<td>16776</td>
<td>5943</td>
<td>467</td>
<td>89291</td>
</tr>
<tr>
<td>%s</td>
<td>56.7</td>
<td>17.3</td>
<td>18.8</td>
<td>6.7</td>
<td>0.5</td>
<td>100</td>
</tr>
<tr>
<td>25-59</td>
<td>503454</td>
<td>73207</td>
<td>37609</td>
<td>15939</td>
<td>1177</td>
<td>631385</td>
</tr>
<tr>
<td>%s</td>
<td>79.7</td>
<td>11.6</td>
<td>6.0</td>
<td>2.5</td>
<td>0.2</td>
<td>100</td>
</tr>
<tr>
<td>60+</td>
<td>229473</td>
<td>9616</td>
<td>2760</td>
<td>623</td>
<td>0</td>
<td>242473</td>
</tr>
<tr>
<td>%s</td>
<td>94.6</td>
<td>4.0</td>
<td>1.1</td>
<td>0.3</td>
<td>0.0</td>
<td>100</td>
</tr>
<tr>
<td>Count</td>
<td>841808</td>
<td>109087</td>
<td>64376</td>
<td>27426</td>
<td>1784</td>
<td>1044481</td>
</tr>
<tr>
<td>Total Percent</td>
<td>80.6</td>
<td>10.4</td>
<td>6.2</td>
<td>2.6</td>
<td>0.2</td>
<td>100</td>
</tr>
</tbody>
</table>

3.0 Defining the Treatment System for Required Capacity Estimation

The literature on tiered frameworks and studies focused on defining and measuring the need for substance use services and supports, and our operationalization of the many conceptual and measurement issues with Canadian population survey data, set the stage for the next step in our model development – defining the capacity requirements. This next step begs the important question “what are services for which we are estimating capacity”? Although the project is grounded in the tiered framework to ensure a broad system approach, this framework also needs to be operationalized in concrete terms for purposes of planning and resource allocation.

Our approach was to revisit the idea of key functions of a system of substance use services and supports that one would consider to be universal across cultures and jurisdictions, although the precise interpretation of these functions may vary across these cultures and jurisdictions. We
consider these functions to comprise the essential *prescriptive* aspect of a comprehensive substance use treatment system. However, as articulated earlier in Section 1.2 these functions can be organized and delivered in a wide variety of *non-prescriptive* service delivery models, including but definitely not limited to, the currently utilized levels of care/service delivery categories embedded in the ASAM criteria and similar models for client placement in North America and elsewhere. While innovation is strongly encouraged in how the core universal functions are delivered to people in need of substance use services and supports, our starting place for projecting capacity requirements is based on currently employed service categories based on a continuum of care conceptualization. This is based on the evidence that, in general, services within this continuum-of-care should be matched to problem severity to maximize treatment outcome in the context of a *stepped care model*. However, consistent with the tiered framework these service categories no longer apply to only those service providers specifically mandated for the provision of substance use treatment and support. *In short, the service categories for which we will project required capacity can be located in virtually any part of the human service delivery system, including through the Internet.* Ultimately, the focus is on workforce distribution and competencies for delivering the core, universal functions across the entire treatment system, interpreted very broadly. This must also include consideration of Internet and mobile based services and supports, as well as screening and brief intervention (SBIRT) implemented in a wide variety of settings.

These universal functions are:

I. **Prevention, Health Promotion and Addressing Stigma and Discrimination:**

Prevention and health promotion are closely related terms and often used together (World Health Organization, 1998). Health promotion is the broader term and in the context of a comprehensive treatment system refers to activities undertaken by service planners, funders, providers and even clients and their families to enable people who have sought help as well as the community as a whole to increase control over and to improve their health. Prevention, or more precisely “disease” prevention, covers measures that not only prevent the occurrence of disease (i.e., risk reduction) but also to arrest its progress and reduce its consequences once established. In this...
core function we are thinking of primary prevention as distinct from secondary prevention (encompassed in early intervention below) and tertiary prevention (encompassed under interventions). In practice these may overlap, for example, program-specific smoking related policies and activities that may either prevent a client from smoking in the first place or contribute to smoking cessation or reduction in use and improvement in health outcomes, including other substance and consequences.

Activities and policies supporting the function of prevention and health promotion may be at both the community and individual level. At the community level this may include advocacy and support for healthy public policy (e.g., use of alcohol in local recreational facilities), support for the creation of supportive environments (e.g., improved community housing, food security, safety or green space; improved recreational opportunities for youth); strengthening community action for health (e.g., participating on a local public health coalition); development of personal skills (e.g., support for local health education campaigns); and re-orientation of health services (e.g., building health promotion into health authority requirements and performance measures for health care services, including a demonstrated commitment to a healthy workplace). This may also include community-level activities aimed at increasing health literacy/learning and improving access to services, education and learning opportunities.

The function of prevention and health promotion also embodies the concept of self-help, which refers to lay people (i.e., non-health professionals) mobilizing the necessary resources to promote, maintain or restore the health of individuals or the community. At the individual level this includes “self-care” or “mutual aid” such as self-medication or involvement in supportive groups.

Addressing stigma and discrimination has been a major topic of concern and priority for the Mental Health Commission of Canada (Martin & Johnston, 2007) and other national and international bodies. There is an ongoing debate about the use of the terms “stigma” and “discrimination”, with many preferring the single term “discrimination”. It is beyond our purpose here to engage in the debate over terminology but rather, to emphasize the importance of efforts to eliminate/reduce the impact of behaviours, attitudes and lack of knowledge and social
conditions on policies that marginalize people or groups through adverse social judgment. There are different types of stigma – health-related (i.e., exclusion at a time when most in need of inclusion, acceptance or compassion); self stigma (i.e., internalized negative attitudes or beliefs about their own condition); and courtesy stigma (i.e., stigma-by-association experienced by those closely associated with stigmatized people) (Martin & Johnston, 2007). Given the scope of these definitions, it is not surprising that a wide variety of interventions have been planned and implemented, ranging from those targeted at the whole population (e.g., working through mass media) to those directly involving people experiencing mental health and substance use problems and/or their families. While evaluation evidence needs to improve across the constellation of options, our main concern here is to note (a) the close connection between reduced stigma and discrimination at a population level and access to requires services and supports; and (b) the role that the overall system of substance use services and supports has to play in reducing the impact of stigma and discrimination among those who do services. This may be through training and education of staff; involving people with lived experience in program planning, governance and evaluation; ensuring organizational and program policies that are non-discriminatory; and provision of person centered services with a focus on self-confidence, self-esteem and personal recovery. Substance use services may also become involved in a wide range of community-level activities that provide education, challenge stereotypes and dispel myths of substance use and related challenges such as mental illness.

II. Harm reduction

The primary focus of harm reduction is on people who are already experiencing some harm due to their substance use. The most appropriate interventions, whether macro or micro, are those geared to movement from more to less harm. Thus, a commonly accepted definition of harm reduction is "Harm reduction is any policy or program designed to reduce drug-related harm without requiring the cessation of drug use". (CAMH, 2003). Given this definition, at a conceptual level as well as a practical level in the planning and implementation of programs and policies, there is considerable overlap between harm reduction and health promotion as well as early identification and intervention. Even the treatment interventions delivered to those with severe
substance use problems can be grounded in a harm reduction philosophy, for example, flexibility in substance use goals.

The focus of harm reduction policy and programs is the reduction of harmful consequences without necessarily requiring any reduction in use, since a change in mode of administration or pattern of substance use may also reduce harm. This focus on reducing harm separates it from zero tolerance approaches to substance use. Further, while urgency may have directed many programs thus far at drug users who are currently experiencing harm, harm reduction is applied at all levels and all stages of use, interventions may be targeted at the individual and community level. At the community level this includes, for example, server intervention programs which decrease public drunkenness; needle and syringe exchange programs which prevent the transmission of HIV among injection drug users; and, environmental controls on tobacco smoking which limit the exposure to second hand smoke. Treatment services may advocate or otherwise support such initiatives in their community.

At an individual client level treatment services may institute policies or undertake many types of activities that support the harm reduction function of the overall system. This may include the following:

- prioritization of each individual's goals with an emphasis on an immediate and realizable reduction in drug-related harm rather than hoped for long-term outcomes such as abstinence. Harm reduction thus recognizes the central role of the consumer in determining the extent and nature of health care services.
- Provision of a wide range of options, for example for treatment of opiate dependence, offering options such as drug substitution, drug maintenance and interventions that adopt safer methods of use.
- A strong emphasis on therapeutic alliance exemplified through a client-centred agreement between a client and their clinician about the treatment approach to be taken based on the expressed needs and desires of the client. Grounded in the knowledge that their very relationship has the power to facilitate positive change, the treatment professional accepts that the client may make less than optimal choices for their health in the short term.
- goal choice can range from abstinence, to the reduction in use of their primary substance, to abstinence from their primary substance but continued use of other substances. Relapse policy whereby a single lapse, several occasions of use, or a return to more regular use is not regarded as a reason to exclude or discharge a client from treatment. The review of treatment goals is ongoing between client and therapist. Harm reduction goals for
substance use *per se* are particularly important for clients with substance use and severe mental disorders.

- Provision of safe sex education and free condoms to help prevent the transmission of infectious disease such as AIDS/HIV and Hepatitis C.
- Provision of a drug treatment court as an initiative to keep seriously dependent users out of prison, provide treatment, and help to integrate them back into the community. A harm reduction approach to drug use in prison includes methadone treatment and provision of clean needles.

The above is by now means an exhaustive list of approaches to operationalize the harm reduction function of a comprehensive treatment system. The mix of policies and activities in support of harm reduction is culture and context bound. As part of a commitment to client-centred care, harm reduction is one approach in a broader spectrum that may also embrace an abstinence-based philosophy.

**III. Early identification and intervention**

This function of a treatment system is well supported by evidence that treatment interventions will be more successful if undertaken “early”. In this context “early” tends to be interpreted as the person using substances at a moderate to high level of risk and perhaps in the “prodromal” stages of developing a substance use disorder by identifying at risk or harmful consumption, or experiencing biopsychosocial consequences that, while challenging, do not meet the criteria for substance dependence. However, “early” may also be interpreted as the person being of young age or at an early developmental stage. In this context early identification and intervention has both risk reduction (i.e. secondary prevention goals) as well as primary prevention goals, to the extent that screening and intervening for mental health problems such as attention challenges and behavioural problems like oppositional defiant disorder or conduct disorders may prevent the future onset of substance use problems (Adair, 2009).

It is important to distinguish screening that may occur as part of the intake and assessment process of a treatment service (e.g., screening all prospective substance use clients for co-occurring mental disorders) and a screening process that is embedded in more generic settings and undertaken *opportunistically* (i.e., targeted screening in a primary care or emergency room...
setting) or universally (i.e. all school aged children). Screening in the context of treatment intake and assessment is considered below as part of the function of Problem Identification, Assessment of Needs and Strengths, and Individualized Treatment Planning. Opportunistic or universal screening in generic settings typically involves very short screening tools such as the CAGE (Mayfield et al., 1974), the AUDIT (Saunders et al., 1993) or the GAIN-Short Screener (Dennis et al., 2006). When the results of the screening questionnaire exceed the established cut-off a brief intervention may be offered in the same setting or a referral made to a treatment service. This depends on the level of risk and harm/severity as reflected in the screening test results.

The early identification and intervention function can also be operationalized in a treatment system via the Internet and mobile technologies. This has the potential for wide coverage and impact and the substance use treatment system field is in the early stages of the research and development process to identify and disseminate Internet-based approaches (see section 1.2). This is also true for mental health generally.

IV. Provision of Information, Engagement, and Linkage Supports

The aspect of this treatment system function this is concerned with the “provision of information” has much in common with the health literacy elements of health promotion. Clients, or prospective clients of treatment services, need to be informed of options available to them in the program they are engaged with as well as other programs in the community. This can be operationalized at a community level through initiatives to increase community awareness, as well as organizations funded to respond to requests for substance use treatment information with subsequent referral/linkage to treatment options (see for example, www. CONNEX.ca). At the individual level, substance use services may have a standard approach with respect to informing clients, or prospective clients, of their rights as well as mutual agreed upon responsibilities upon acceptance into the program, including all associated costs. In addition, clients may have access to information on treatment outcomes, client satisfaction or other performance related measurement and evaluation information. Ideally this information is benchmarked against similar providers and available in a client-friendly format.
With respect to the functions related to treatment engagement this is an area of critical importance to retaining clients in the treatment service for sufficient duration, and with sufficient exposure to treatment interventions, to have an impact. Adopting a motivational interviewing approach to all client contacts at the treatment entry stage is critical. In addition it is important to recognize the role of coercion in the treatment entry process (e.g., the high percentage of clients that are mandated to present for treatment by the justice or child welfare system) and that engagement strategies appropriate for these clients be used (e.g., providing brief treatment options that meet immediate needs but which may stimulate interest and motivation in more intensive interventions at another time. Many services are organized around a stages-of-change approach that seeks to measure the person’s level of motivation (e.g., precontemplation, contemplation) and triage them accordingly into different treatment options. Other motivational frameworks can also be used that focus on the type/source of the motivation for treatment (e.g., identified, introjected or external) (Ryan & Deci, 2000; Urbanoski & Wilde, in press)) rather than the level or stage of motivation.

The engagement function can also be addressed by ensuring a welcoming attitude among all staff as well as the creation of a welcoming physical environment (e.g., non-institutional look-and-feel; physical layout; or posters with content reflecting a diversity of people (e.g., age, gender, cultural and ethnic heritage). Engagement is also impacted by the overall length and efficiency of the treatment entry process, including the intake, screening and assessment tools and processes (Hilton, 2011). Trained “engagement specialists” may also be employed and incorporated into the intake process to assist in removing barriers to treatment entry, such as transportation, child care, work commitments, and basic necessities such as toiletries and appropriate clothing for appointments or overnight stays in residential programs (Scott et al., 2009).

With respect to the linkage function this can be operationalized formally via case management or “wrap-around” services that support clients by linking them with other services in the community. Some treatment systems have created specific positions referred to as “linkage
managers” or “system navigators” recognizing the difficulties some clients or prospective clients have accessing services and experiencing continuity across multiple service providers. This is particularly needed for the most severe and marginalized client populations, including those with severe co-occurring mental disorders that may experience challenges accessing integrated mental health and substance use treatment. Another important development with respect to the linkage function in from the area of outcome monitoring with the inclusion of a “return-to-treatment” protocol as part of the routine follow-up (Scott et al., 2009).

V. Problem Identification, Assessment of Strengths and Needs, and Individualized Treatment and Support Planning

This function encompasses both screening and assessment, further articulated below, as well as individualized treatment and support planning.

Screening is the use of evidence-based procedures and tools to identify individuals with problems, or those who are at risk for developing problems. The goal of screening is to detect these problems and to set the stage for subsequent assessment and treatment – not to provide a detailed description of problem areas or make a diagnosis. There are two stages in screening (Rush & Castel, 2010):

i. Stage 1 - Case Finding: The use of short tools to determine the possibility that a client has any disorder/problem or broad groups of disorders/problem areas, for example the GAIN short screener (Dennis, Chan, & Funk, 2006).

ii. Stage 2 - Case Definition: The use of more detailed and specific tools to tentatively identify one or more specific disorders or problem areas, for example, the Psychiatric Diagnostic Screening Questionnaire (Zimmerman & Mattia, 2001) or the Problem Oriented Screening Instrument for Teenagers, for adolescents (Knight et al., 2001; Knight et al., 2003).

Assessment and Treatment Planning: Information captured by assessment tools provides a more individualized identification of the nature and extent of a client’s problem areas and strengths, is used to help develop a treatment plan with the client, and can determine which services the client needs to be referred to. There are also two stages in assessment:

i. Stage 1 - Information Gathering and Placement: Clients are administered a tool that captures information required for more targeted referral for subsequent detailed assessment
and treatment planning, for example the GAIN Q3 in the GAIN suite of tools (www.chestnut.org)

**ii. Stage 2 - Diagnosis and Treatment Planning:** Clients are administered tools that identify and describe common problems areas and strengths, and how they are interrelated. The resulting information needs to be adequate for diagnosis and treatment planning and additional referral, for example the GAIN I in the GAIN family of tools (www.chestnut.org) or the Addiction Severity Index (McLellan et al., 1992).

### VI. Delivery of Substance Use and Specific and Biophysical Interventions and Supports

There is a wide variety of interventions specifically aimed at reducing substance use and ameliorating related problems. The most research reviews confirm the effectiveness of some, but not all of them (Martin & Rehm, in press; Lev-Ran et al., in press). Based on these reviews, the following groupings of interventions were identified:

- Motivational enhancement therapy
- Social skill training
- Relapse prevention therapy
- Behavioural self-control training
- Brief interventions
- Community reinforcement approach
- Cue exposure treatment
- Marital/family therapy
- Twelve step facilitation
- Psychotherapy
- Case management
- General counseling
- Pharmacotherapy.

Of the non-pharmacological interventions, those with the strongest empirical support are motivational enhancement therapy, a variety of cognitive-behavioural interventions and brief
interventions. Martin and Rehm (in press) conclude that there is little basis on which to recommend one of the available modalities over another, but good reason to select among them.

Martin and Rehm (in press), and Rush (2012) in his editorial commentary on the review papers emphasize the need to consider “therapist effects” in the interpretation and application of this literature on treatment effectiveness. Therapeutic alliance may account for as much as 30% of the variance in treatment outcome, a finding that emphasizes, for example, the importance of empathy, communication, and trust-building in the delivery of interventions. In addition to “therapist effects”, there are many aspects of the treatment service itself that may impact on the effectiveness of the interventions being delivered. These domains have been identified as important aspects of the clients “perception of care” and include issues related to access and entry into the service (e.g., convenience, welcoming); their participation in the treatment process; their rights (e.g., right to privacy and a complaint process); the program environment (e.g., safety, accommodation for disability); discharge planning and continuity-of-care (e.g., being informed of where to get subsequent support).

In addition to interventions specifically for people experiencing high risk substance use and related problems, substance use services and supports typically provide supportive interventions for family members, or more broadly speaking, significant others, who are negatively impacted by their relationship with the person. These may be delivered irrespective of the involvement of the person with the substance use problem.

Several authors also note the gap between the interventions with strong evidence of treatment effectiveness (i.e., what we know) and what is routinely delivered in practice settings (i.e., what we do). This suggests that needs-based planning include a review of interventions currently being delivered in a given jurisdiction and contrasted with those identified as most effective in terms of research evidence.

VII. Continuing Care/Recovery Monitoring

As noted earlier in this report, the literature on substance use services and supports advocates a conceptual shift to a chronic disease or chronic care paradigm that acknowledges the
likelihood of variable stages of recovery (e.g., “relapse”) and multiple service episodes over time. This model is especially appropriate for individuals at higher levels of severity. As with other chronic, relapsing conditions there is a need for some level of service to continue after an official discharge. There are many terms applied to these continuing services, for example, continuing care, aftercare, and more recently, recovery monitoring checkups (RMC) (Dennis et al., 2003; Rush et al., 2008).

The term “extended interventions” is a catch-all term to apply to post-treatment interventions longer than six months in duration (McKay, 2005). The RMC intervention involves a routine post-treatment follow-up with a protocol to facilitate treatment re-entry based on defined criteria and, of course, the persons interest in additional services and supports. Results are very strong in terms of health outcomes and overall treatment engagement (Dennis & Scott, ). The literature on the effectiveness of these continuing services is reasonably strong, but also pointing toward adaptive protocols that can be adjusted up or down in response to changes in symptoms and functioning over time.

Examples of these continuing services include connection the self-help groups such as Alcoholics Anonymous, telephone or periodic face-to-face contacts, regular “alumni” meetings, and more recently, e-mail, text messaging or other Internet/mobile-based interventions such as a web forum with or without therapist support.

VIII. Delivery of Substance Use Specific and Highly Integrated Psychosocial, Medical and Psychiatric Interventions and Supports

There is a large and still-growing literature on people with co-occurring substance use and mental health problems (Health Canada, 2000) and challenges meeting their needs. In that report, and other subsequent literature on the topic, the conversation has expanded to include co-morbidity related to physical health, and this complexity is firmly embedded in the tiered framework underlying the needs-based planning model.
The idea that all substance use services and supports should have the basic capability for treating and supporting people with complex conditions has been proposed (Skinner, 2005; McGovern et al., 2007). This would include displaying positive attitudes and values independent of problem complexity; competencies for screening and referral; basic (non-diagnostic) assessment of substance use and mental health problems and their relationship; interventions such as motivational interviewing, harm reduction and relapse prevention; and case management, including facilitating access to food and shelter, and other basic needs. However, in addition to CD-capable programs, other programs are needed which fully integrate substance use and mental health treatment and support for individuals with high severity on both issues. This includes provision of, or coordinated access to, care for physical health challenges. In these “CD-enhanced” programs, specialized assessment methods are employed (e.g., psychiatric interview), as are specialized therapies such as medication, dialectical behaviour therapy, and other elements of evidence-based treatment for people with severe mental illness and co-occurring substance use disorders such as stage-wide assessment, fully integrated treatment planning, and CD-family groups (Mueser, 2003). These CD-enhanced services also provide consultation on concurrent disorders to other programs and services, as well as clinical training and education.

Substance use services can be assessed with structured rating scales to assess whether they are CD-Capable, or CD-Enhanced (McGovern et al., 2007).
Table 2: Mapping the core, universal treatment functions onto the five tiers in the tiered framework

<table>
<thead>
<tr>
<th>Function</th>
<th>Tier 5</th>
<th>Tier 4</th>
<th>Tier 3</th>
<th>Tier 2</th>
<th>Tier 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prevention and health promotion and addressing stigma and discrimination</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
<td>X</td>
</tr>
<tr>
<td>Harm reduction</td>
<td></td>
<td>X</td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Early identification and intervention</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Provision of information, engagement and linkage supports</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Problem identification, assessment of strengths and needs, and individualized treatment and support planning</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Delivery of substance use specific and biopsychosocial Interventions and supports</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continuing care/recovery monitoring</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delivery of substance use specific and highly integrated psychosocial, medical and psychiatric Interventions and supports</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3.1 Services Required to Deliver the Universal Treatment System Functions

As noted above, the services required to deliver the universal treatment functions can span a wide range of sectors, including but not limited to, the specialized substance use service sector. We engaged our project Advisory Committee in identifying the service categories used in their respective jurisdictions, and developed a common set of categories for use in our pan-Canadian model for estimating capacity requirements. We also sought to synchronize our categories with the work of the Canadian Centre on Substance Abuse’s National Treatment Indicators project to ensure roll-up and eventual comparison to current treatment service utilization, so as to eventually yield our population-based gap analysis (see Figure 6, pg. 16). We also further explored service categories used at the local level across Canada via our baseline survey of planning regions (see Appendix D). Lastly, we aimed for synergy with the more widely-used ASAM levels of care and placement criteria while also including a service category consistent with the burgeoning literature on Screening, Brief Intervention and Referral (SBIRT). A SBIRT is a type of service currently outside the scope of the ASAM categorization system, but widely supported by research evidence if appropriately placed in many generic service delivery sectors (Babor et al., 2007). We also aimed to incorporate Internet and Mobile-based services and supports.

The service categories required to deliver the functions are as follows:

1. Screening, Brief Intervention, Referral to Treatment (SBIRT)

These services take a comprehensive, integrated approach to identify people who have developed or are at risk of developing substance use disorders (Babor et al., 2007). Typically, brief screening tools are employed opportunistically or universally with clients, or identified sub-populations, presenting for assistance or otherwise engaged in generic service delivery settings (e.g., primary care, emergency rooms, social welfare, employee assistance programs, correctional services, or schools). They are used to identify those at high risk for developing substance use problems that can be effectively ameliorated with brief, but structured intervention. Those with more severe problems, defined on the basis of risk – levels and/or patterns of consumption as well as acuity, or chronicity and complexity of concomitant problems, are referred to treatment for more comprehensive, targeted screening and assessment.
2. Withdrawal Management Services

These services often assist with voluntary withdrawal from substances and are provided at three levels of care – home-based/mobile; social/community residential; and complexity enhanced/hospital-based. In addition to various intervention activities, withdrawal management services provide activities aimed at the universal functions of prevention, health promotion and stigma and discrimination reduction; harm reduction; early identification and intervention; provision of information, engagement and linkage supports; problem identification, screening and assessments of needs and strengths and individualized treatment planning; and continuing care. They may provide and/or be closely associated with services offering interventions.

i. Home-based/mobile: This involves voluntary withdrawal management from a client’s home or other safe accommodation. It may also involve visits to central location (e.g., addictions program) during the day while returning home at night. This service may involve a medical assessment by a physician and regular monitoring by a nurse and health care worker during the withdrawal process to provide medical management and support. Before the client is discharged, case workers seek to ensure that the client and/or those supporting the client are connected to other substance use treatment services.

ii. Social/community/residential: This involves voluntary withdrawal management in a non-hospital residential setting. This service may involve a medical assessment by a physician and regular monitoring by a nurse and health care worker during the withdrawal process to provide medical management and support. Treatment can be provided with or without drug therapy. Before the client is discharged, case workers ensure that the client and/or those supporting the client are connected to other substance use treatment services.

iii. Complexity enhanced/hospital-based: Assistance with voluntary withdrawal management, where care is provided within the structure of a health care setting with a high level of medical and psychiatric capability. Treatment can be provided with or without drug therapy, but typically involves medication management, for example for co-occurring mental disorders.
Before the client is discharged, case workers ensure that the client and/or those supporting
the client are connected to other substance use treatment services.

3. Community Services and Supports
These substance use services are provided on a regular basis (e.g., weekly, bi-weekly) for clients
that live elsewhere and are offered at three levels of care: minimal, moderate, and intensive. In
addition to counseling and other intervention activities, all community services and supports
include activities aimed at the universal functions of prevention and health promotion; harm
reduction; provision of information, engagement and linkage supports; problem identification,
assessments of needs and strengths and individualized treatment planning; and continuing
care/recovery monitoring.

i. Community Services minimal\textsuperscript{11}: A very limited number of one-hour sessions of addiction-
specific counseling activities in individual or group formats. Minimal intervention techniques
are also used for clients who are unable or unwilling to access more intensive, structured
substance use treatment services. Some examples include motivational interviewing and
encouraging moderate use of substances or abstinence, or engaging in brief and structured
efforts to help pregnant clients stop using substances (Barry, 1993).

ii. Community Services moderate: A scheduled course of one – two hour sessions of
addiction-specific counseling in group sessions or individual formats. This category includes
opioid replacement services with a clear counseling component.

iii. Community Services intensive: A structured schedule of addiction-specific counseling
activities taking place over the day or in the evening. Programs are generally provided five
days/evenings per week for a defined number of weeks while the client resides elsewhere.

\textsuperscript{11} The project team is currently considering defining these levels of community services on the basis of average hours
of service.
4. Residential Services and Supports

For these services, clients temporarily reside in an environment where substance use treatment services and/or supports are provided. There are three different levels of residential services: supportive recovery, residential treatment, and complexity enhanced. In addition to counseling and other intervention activities, all residential services include activities aimed at the universal functions of prevention and health promotion; harm reduction; problem identification, assessments of needs and strengths and individualized treatment planning; provision of information, engagement and linkage supports; and continuing care/recovery monitoring.

i. Supportive recovery: Accommodation in an alcohol and drug-free setting not offering highly structured programs. Substance use treatment interventions are not typically offered on site, with the exception of some counseling and case management. Stabilization services may be offered for clients prior to assessment, withdrawal management, or pre- or post-treatment in community or residential services. Accommodation and related recovery support is provided in a stable, sober environment, and activities may include coaching for daily living, community reintegration, and participating in mutual aid supports and some counseling and case management.

ii. Residential treatment: Clients are engaged in a structured, scheduled program of interventions and activities specifically designed to treat substance use problems and/or co-occurring disorders. Clients reside on-site and have access to 24-hour support and an alcohol and drug-free residential treatment milieu.

iii. Complexity enhanced (medical/psychiatric): A structured, scheduled program of substance use treatment activities provided for clients with significant medical needs, co-occurring disorders, or other complex needs (e.g., infections, traumatic brain injury, developmental disability). Clients require individualized medical or psychiatric care to participate, and have 24-hour access to residential support. Drug therapy is a normative element of treatment interventions.
In addition to these residential services and supports, the project team and Advisory Committee struggled with how best to incorporate other housing needs of people with substance use problems. Housing needs are themselves on a continuum ranging from short-term, low threshold shelter\textsuperscript{12} to supervised supported housing where structured support and counselling may be accessed in-house by residents. Rather than viewing this housing continuum as a sub-category of residential services and supports \textit{per se}, it was viewed as a service continuum within the range of psychosocial supports needed by many people with substance use problems. For the present, this housing continuum is seen as outside the scope of the needs based planning model.

5. Internet and Mobile Services and Supports

As noted earlier in the report, Internet and mobile-based technologies are emerging as critically important in the delivery of substance use services and supports. These technologies are being harnessed to distribute educational/health literacy material, and a range of self-administered and therapist-assisted interventions.

6. Mutual Aid Resources

Mutual aid resources such as Alcoholics Anonymous, Narcotics Anonymous etc. are widely recognized as a key component of substance use systems, albeit not formally included in planning and funding processes. However, their important role needs to be acknowledged given the evidence that they are widely used, often as the initial access point, and an important adjunct to formal services. Many services offer mutual aid groups on site, and/or incorporate these groups in continuing care plans. The research on the effectiveness of Alcoholics Anonymous, for example, shows positive benefits of participation (Humphreys et al., 2004).

3.2 Schematic Diagram of Needs-Based Planning Model for Substance Use Services and Supports

The diagram in Figure 8 is a cross-sectional representation of how people (aged 15 and over) can be distributed throughout the above service categories from the perspective of the 5-tiered framework. The movement of clients through the substance use treatment system is seen

\textsuperscript{12} Low-threshold signifies minimal house rules, for example, use of substances may be allowed as long as it does not contribute to disruptive behaviour in the setting.
as complex and dynamic and the diagram aims to represent the potential movement that clients may have between the services. That said the diagram remain a simplistic representation of what are in reality very complex service utilization trajectories influenced by many factors, including the individuals in profiles of needs and strengths, community context, service availability and treatment outcomes. To minimize the complexity of the diagram and the statistical modeling process, each tier is best seen as a cross-sectional representation of these trajectories. The challenge from a modeling perspective is to adequately represent these highly complex trajectories in order to derive numerical capacity estimates that include flow across and within the many service categories. The approach taken in the estimation procedures outlined below is to estimate flow across the big categories of withdrawal management, community services and supports and residential services and supports within a given year, but not within each of these categories (e.g., community intensive to community moderate or residential services to supportive recovery). This is less than ideal but acknowledges current limitations of both empirical data and expert opinion for more detailed estimation.

These diagrams were developed to assist system planners in conceptualizing client flow and the estimated need for various types of substance use services and supports. We have developed Excel charts that parallel each of the diagrams and which facilitate rapid calculation of capacity requirements based on changes/experimentation with the values of parameters in the model for each tier.

In a subsequent section, we describe our preliminary attempt at estimating the “parameters” in the flow diagram; that is the proportions used to differentiate and allocate individuals into the various service categories in the model:

- SBIRT
- Withdrawal management (3 levels)
  - Home-based/mobile
  - Social/community/residential
  - Complexity enhanced/hospital-based
- Community Services and Supports (3 levels)
  - Community Services minimal
  - Community Services moderate
  - Community Services intensive
• Residential Services and Supports (3 levels)
  o Supportive recovery
  o Residential treatment
  o Complexity enhanced (medical/psychiatric)

Capacity estimates for Internet and mobile-bases services are not estimated at present.

For the purposes of this interim report, we present only one diagram for Tiers 1 – 5, which are the same structurally, but which will eventually be populated with quite different parameters reflecting the graduated severity of the population served by these tiers. As our primary emphasis is on Tiers 2 – 5 treatment services, we only briefly mention that Tier 1 is exclusively about prevention, health promotion and stigma and discrimination reduction services, and that the in-need population in Tier 1 is the overall target population for these services and activities. This would run the gamut from alcohol and drug policy (e.g., restrictions on availability of alcohol), community-level interventions (e.g., those focused on determinants of health, server intervention training, or alcohol in recreational facilities), and targeted health education (e.g., school educational curricula, prevention messages in the work place).

For purposes of illustration, we will assume that Figure 8 is representative of Tier 4. Based on the population defined in our modeling of population survey data, Tier 4 includes:

Respondents experienced several substance use related problems or who met the criteria for substance abuse or substance dependence **AND:**

1. had a positive response to the question "During the past 12 months, was there ever a time when you felt that you needed help for your emotions, mental health or use of alcohol or drugs but didn't receive it?" **OR**

2. utilized formal health services because of mental health or substance use issues within the past 12 months **OR**

3. showed significant interference in some aspect of their lives from their drug or alcohol use as indicated by the flag variables for alcohol or drug interference (at least 4 out of 10 on any of the 5 interference questions for each of drugs and alcohol).
The top of Figure 8 highlights the specific tier under consideration and the health planning region. The population aged 15 and over is derived from the most recent census data. Two “inflows” to the Total Demand Population are represented – one being help-seekers who, for whatever reason, have decided to seek assistance with their substance use problem. This, in itself, is a complex process involving a wide range of factors including coercion/social control, or more voluntary acknowledgement and motivation to access services. Some may have been identified and referred from various human services, but not formally screened or previously assessed for problem identification and description.

The second pathway into the “Total Demand Population” is via more formalized Screening, Brief Intervention and Referral services (SBIRT) (e.g., delivered proactively in primary care or emergency room setting). Some participants will be referred on to other parts of the treatment system (e.g., withdrawal management, community services, and residential services). This may occur immediately based on exceeding a pre-determined cut-off point in the screening protocol, or may result from a poor outcome with the brief intervention within the SBIRT service. A proportion of those screened will be determined NSR, that is “No Services Required”.

A proportion of the Total Demand Population flows to each of the three service categories represented in the middle of the diagram (p₅, p₆, and p₇). For each of withdrawal management, community services and residential services, the system function of “Problem Identification, Assessment of Needs and Strengths and Individualized Treatment Planning” is represented by the screening and assessment labels. As noted earlier, core functions such as prevention, health promotion and stigma and discrimination reduction; harm reduction; early identification and intervention; provision of information, engagement and linkage supports; problem identification, screening and assessments of needs and strengths and individualized treatment support planning; delivery of substance use specific and biophysical interventions and supports; continuing care/recovery monitoring and delivery of substance use specific and highly integrated psychosocial, medical and psychiatric interventions supports not shown but would also need to be considered in estimating workforce requirements and competencies in these services. Under each of the main service categories, the three subcategories are represented; for example, community
services minimal, moderate and intensive. Each are “allocated” a proportion of cases for that service category (e.g., $p_9$, $p_{10}$, and $p_{11}$ for withdrawal management sub-categories)
Figure 8: SCHEMATIC DIAGRAM OF NEEDS-BASED PLANNING MODEL FOR SUBSTANCE USE SERVICES AND SUPPORTS – TIERS 1 to 5

Region: ___________ Total Population of 15 and Over: ________

IN-NEED POPULATION IN THIS TIER (N = XXXX)

POPULATION-LEVEL HEALTH PREVENTION, PROMOTION, STIGMA AND DISCRIMINATION

SCREENING, BRIEF INTERVENTION AND REFERRAL TO TREATMENT AND EARLY INTERVENTION (SBIRT)

TOTAL SENT TO SUBSTANCE USE SERVICES AND SUPPORTS FROM SBIRT

NO SERVICES REQUIRED (NMR)

NATURALISTIC HELP SEEKERS

DIRECT TO TREATMENT / SUPPORT SERVICES

TOTAL DEMAND POPULATION IN THIS TIER (D = XXXX)

UNIVERSAL TREATMENT SYSTEMS FUNCTIONS

INTERNET AND MOBILE-BASED SERVICES AND SUPPORTS

MEMBERSHIP AND EARLY INTERVENTION

REFERRAL TO TREATMENT INTERVENTION AND SCREENING, BRIEF (SBIRT)

UNIVERSAL TREATMENT SYSTEMS FUNCTIONS

HOSPITAL-BASED MANAGEMENT

WITHDRAWAL MANAGEMENT

HOME – BASED / MOBILE

SOCIAL / COMMUNITY / RESIDENTIAL

COMPLEXITY ENHANCED / HOSPITAL – BASED

COMMUNITY SERVICES AND SUPPORTS

COMMUNITY MINIMAL

COMMUNITY MODERATE

COMMUNITY INTENSIVE

RESIDENTIAL SERVICES AND SUPPORTS

SUPPORTED RECOVERY

RESIDENTIAL SERVICES

COMPLEXITY ENHANCED (MEDICAL / PSYCHIATRIC)

Mutual Aid Resources

Development of a Needs-Based Planning Model for Substance Use Services and Supports in Canada

62
3.3 The Plan to Populate the Parameters of the Model

To begin the process of estimating the parameters in the model, and by default, the number of people needing service in each service category within the model, we have begun compiling data from several different sources. Importantly, no one source of data yields estimates for all the parameters in the flow diagram. These data are still being analyzed and synthesized for the first draft of model parameters and capacity requirements prior to pilot testing.

1. We have reviewed the literature on help-seeking and SBIRT in order to derive the best estimates possible from the research evidence on the likely proportion of the population in different severity categories likely to seek help for substance use concerns in a given year. This research is currently being synthesized.

2. We have accessed data compiled by Chestnut Health Systems (www.chestnut.org) in Illinois on over 26000 clients assessed with the GAIN I, a comprehensive biopsychosocial assessment tool that provides information for treatment planning, diagnosis and client placement. The tool combines over 100 scales and subscales that can be used for DSM-IV-based diagnoses, and ASAM-based level of care placement. Importantly, the GAIN-I yields a placement recommendation based on what the client needs as well as the actual placement, the latter obviously influenced by service availability and cost factors. The GAIN-I database, therefore, afforded a unique opportunity to: a) categorize existing clients across many treatment providers into the five tiers of problem severity using a close approximation of the criteria that we used in our analysis of the Canadian population survey data; and b) determine the proportion of clients needing various categories of services that closely approximate those used in our model (i.e. ASAM levels of care). Although there are obvious limitations to using US-based data to project Canadian needs, we are exploring the opportunity to replicate the analyses using existing Canadian GAIN-I data available for Quebec. In addition, our first look at these US-data (still under analysis) shows surprising consistency with other data from Canadian sources, thus increasing our confidence in using it as one of our data sources for triangulation.

3. We have also accessed existing data on service use trends from the Drug and Alcohol Treatment Information System (DATIS) database in Ontario (www.DATIS.ca). DATIS is the
Ontario reporting system for publicly-funded addiction treatment services. It gathers and reports on data from approximately 150 public agencies, which deliver a mix of withdrawal management services, community treatment (e.g., community services and supports) and residential services and supports to approximately 47,000 cases annually. Private, self-help, and the majority of Ontario’s opioid maintenance programs are not included in DATIS. We have obtained DATIS information for each of the last three fiscal years on the proportion of the total treatment caseload seen within each of these broad service categories, and a finer breakdown as available within each category (e.g., levels of withdrawal management) Additional analyses are underway to describe the trajectories of clients who enter services in each of these categories and move on to other service categories within the same year (e.g., entering withdrawal management and subsequently entering residential services).

4. **Alberta Health Services** (AHS) have also provided their most recent service utilization data from the 2010/2011 fiscal year. These data cover utilization of addiction services that are provided directly by AHS, as well as AHS-funded or contracted services. The data provided admissions/enrollments in services, but not unique clients; and do not include private or hospital services. Although the data available are not at the same level of detail as the DATIS information from Ontario, they may be helpful nonetheless as they cover another comprehensive provincial treatment information system of specialized addiction services.

5. We also derived projections from several regions in the **Quebec City region** of the province of Quebec that have a history of using the old “Rush model” (1990). That model inspired several Quebec researchers to pilot a project, whereby specialized ‘Liaison Nurses in Addiction’ (LNA) were placed in the emergency rooms of four Quebec City area hospitals to screen incoming patients for substance use problems (Blanchette-Martin, Ferland, Tremblay, & Garceau, 2011). The LNA was responsible for identifying all people presenting to emergency rooms with a potential substance use disorder. The implementation of the LNAs in emergency rooms was intended to reach more people in need; to reduce their overall substance use related number of hospital visits; and to link them with the appropriate services more quickly. The program has many but not all features of an SBIRT program, for example, no universal screening tool was used and brief intervention was provided by the agency to which the person was connected,
rather than the LNA. The results from that project, combined with existing information on the utilization of substance use services within the Quebec treatment system, are being used to estimate parameters in the needs-based planning model.

6. **Expert opinion/key informants:** We will be conducting a Delphi process with a group of substance use treatment service experts across Canada. The group will be comprised of individuals who have significant service planning or clinical experience to help refine the estimates required for this process. Consistent with the Delphi method, we will provide the Delphi members with specific questions about these parameters and their consistency with their own experience. After the first round, a facilitator will provide an anonymous summary of the feedback to each of the members, and participants then have an option to revise their original estimates, or provide reasons for their answers. Members will be encouraged to revise their earlier estimates in light of the replies of other members of their panel. During this process, the range of values for the parameter estimates will converge. We plan on conducting three rounds and will use the results to further adjust the estimates in our model.

7. **Pilot testing** will be performed in five jurisdictions across Canada. We will be piloting the model at both the local/regional health authority and the provincial level, in order to determine issues in the application of the model for different health care delivery systems and planning levels. The pilot sites are Fraser Health Regional Health Authority, British Columbia; Northern Health Regional Health Authority, British Columbia; and the provinces of Saskatchewan and Prince Edward Island and Nova Scotia. Brief descriptions of the pilot site areas are provided in Appendix E. The pilot sites were chosen for a variety of reasons; for example Fraser Health has prior experience using the old Rush (1990) model, and we expect that their familiarity with the old model will facilitate application of new model. Northern Health has previously used the tiered framework in their planning processes, but not specific forecasting procedures as outlined in the 1990 Rush model. We also wanted to pilot in both rural (Northern Health, BC) and urban (Fraser Health, BC) regions. Northern Health in BC and the province of Saskatchewan also have large populations of people of First Nations heritage, and we are interested in cultural adaptability of the model. Piloting in Prince Edward Island
and Nova Scotia will help us assess the applicability of the model to Atlantic Canada and in a jurisdiction now under one centralized health authority (Health PEI).

4.0 Limitations, Special Considerations and Next Steps

This project was planned from the outset as one that would be implemented in stages, and certainly the development of the planning model will undoubtedly require further iterations as our understanding of substance use treatment systems evolves, and as new research improves our model building and testing capability. We conclude this interim report with a brief summary of the most salient limitations to date, special considerations and next steps for the project workplan (to conclude March 31, 2013).

**Model Validation:** Validation-related questions concern both the individual parameters being estimated within the flow diagram, as well as the conceptualization and results of the modeling process as a whole. Clearly we have built a largely “Made in Canada” planning model using mostly Canadian data and key informants. Thus, our primary interest in validation will be in the Canadian context. That said, a role of our international expert panel is to comment on the general approach we have followed (e.g., our use of the tiered framework; our measurement model to operationalize need for services and need categories; our definitions of system-level functions and service categories; the development of the flow diagram and parameter estimation procedures). The details and precise definitions, as well as availability of data, may vary across jurisdictions, but we have aimed to develop a needs-based planning process transferable to other jurisdictions, with the provision of the appropriate toolkits and supports.

We anticipate that the pilot testing of the draft model in five diverse Canadian jurisdictions will inform us regarding the perceived usefulness of the model in local planning processes, and whether the capacity estimates being generated have sufficient face validity for local planners to incorporate them into discussions about funding allocation. The pilot testing is also being seen as another step in the refinement of the model, and its parameters. This is consistent with a developmental evaluation and participating research process. Subsequent, multiple case studies can be implemented to continue that process of validation against other local data and key
informant opinion and continue the process of model refinement. Multiple applications may, for example, identify upper and lower limits of selected parameters that appear to be highly context-dependent. Ongoing substance use services and epidemiological research will also continue to inform the model parameters.

In the United Kingdom, David Best and colleagues used treatment outcome data to calibrate their model parameters, essentially arguing that the ultimate test of the validity of the model is whether people get to the services that optimize their outcomes. This may have been possible in the Birmingham situation, given a more restricted focus of the model on substance use services and the criminal justice system, and therefore a more circumscribed system for determining outcomes. At present, there is no treatment outcome monitoring system in any Canadian jurisdiction capable of supporting this calibration function for our planning model. Outcome monitoring systems are at various stages of development in a small number of Canadian jurisdictions, and the development/promotion of common outcome monitoring models and measures is on the future agenda of the National Treatment Indicators Project. Thus, testing and calibration of the needs-based planning model based on treatment outcomes may be possible in the future in some Canadian jurisdictions.

The available data on treatment service utilization that helps us develop our initial parameters in the flow diagram is limited in two important ways. Firstly, with the exception of the GAIN-I data from Chestnut Health Systems, the data are about service utilization and such data may not reflect client/population needs. Using data from large treatment systems rather than individual treatment programs obviates this concern somewhat as the data are less likely to be skewed by small-area nuances in the availability of some types of services. Secondly, the model is projecting needs for substance use services that would be located and distributed within non-specialized, generic human services (e.g., trained counsellors in family practice or emergency room settings). However, the data on current utilization are derived from specialized substance use services and, therefore, may not accurately estimate the distribution of need across the service categories.
Another concern in our model building process is the projection of national-level data to local planning areas without adjustment for community context and the “true prevalence” of substance use and related problems. This is a challenge for any synthetic estimation procedure; indeed, some would say the Achilles heel. With sufficient sample size for a local community survey, and if that survey were modeled after the structure and questions of the CCHS 1.2, it may be possible to validate our projections from the national survey to at least begin to explore the limits to our confidence in these projections. Future work with the next round of the CCHS mental health survey will incorporate multi-level modeling that incorporates local planning area data. This approach will go a long way to obviate this concern about our survey projections. For the moment, we are concerned with having “good enough data” validated for face validity and perceived usefulness by local planners. Our pilot testing will assess confidence and potential concerns using data from this planning model compared to other (or no) local information on capacity requirements.

4.1 Modeling and Estimating

It is important to re-iterate our challenges modeling and estimating highly complex individual treatment trajectories. Our compromise position is to incorporate flow across the major categories of withdrawal management, and community and residential services and supports within a one year time frame, but not at a finer level within these broad categories.

4.2 Internet and Mobile-Based Services

As important as Internet and mobile-based services and supports are becoming it is not possible to formally estimate the additional “capacity” they may be able to effectively treat and support in the context of the overall system. However, while a numerical capacity estimate may not be possible at present, we recommend formal consideration in applications of the needs-based planning model as they hold considerable untapped potential for increasing reach, effectiveness and efficiency.
4.3 Sub-Populations

Substance use treatment systems must address the needs of many sub-populations such as youth, women and diverse populations defined by gender and/or sexual identity, and culture and ethnicity, for example. It is beyond the scope of the project at the present time to develop and test population-specific models. That said, we will be exploring applicability of the model for youth in one of the pilot sites (Nova Scotia) and other developmental work is underway in the province of Quebec.

4.4 Services for Family Members and Significant Others

Many substance use treatment systems are organized to provide services for family members of those in substance use treatment, either as clients in their own right or as supporters of the client with substance use problems. Using data from the DATIS database, we have initiated a process to develop estimates of the additional required capacity for family members/significant others given an estimated demand population for substance use services.

4.5 Gambling Services

Services for people with gambling problems are offered in many Canadian substance use services, but are not provided consistently across the country. To estimate the needs of this population is not within the scope of this project. However, the issue has been recognized for future consideration.

4.6 Non-Survey Populations

The CCHS 1.2 did not include certain populations in Canada, including people living on First Nations reserves; those incarcerated; people that were institutionalized during the survey timeframe (e.g., hospitals, long-term care); people living in the Canadian Territories; and people who are homeless (e.g., couch surfing, living in shelters, living outdoors). As a compliment to this project, we have begun to approximate the number of people from these non-surveyed populations in each of the Canadian health services planning areas. Another step will be to estimate the proportion of these populations that fall within each of the need categories in the five-tiered model.
The initial work on homeless populations is shown in Appendix F. The First Nations populations living on reserves across Canada are shown in Appendix G. With these approximate population numbers and corresponding distributions across the need categories, local jurisdictions will have the choice to apply these populations to the model as deemed necessary. Table 3 shows how these estimates may later be incorporated into regional populations for planning purposes.

### Table 3: In-Need Population Table

**Region:** Champlain LHIN  
**Total Population:** 1,044,481

<table>
<thead>
<tr>
<th>In Need Populations</th>
<th>Tier 1</th>
<th>Tier 2</th>
<th>Tier 3</th>
<th>Tier 4</th>
<th>Tier 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Survey Estimates (N=1,044,481)</td>
<td>841,808</td>
<td>109,087</td>
<td>64,376</td>
<td>27,426</td>
<td>1784</td>
</tr>
<tr>
<td>Homeless (n= )</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>First Nations (n= )</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Justice/Institutionalized (n= )</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Long-term Psychiatric (n= )</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>Total In-Need Population</strong></td>
<td>841,808</td>
<td>109,087</td>
<td>64,376</td>
<td>27,426</td>
<td>1784</td>
</tr>
</tbody>
</table>

Lastly, with the support of additional funding and project consultants, we have begun a process to see how the key concepts, terminology, schematic representations and estimation procedures need to be adjusted for Canada’s First Nation, Métis and Inuit populations. The intention is not to develop a new version or versions of the model for these populations at the present time, but rather to begin to explore the need for, and scope of, potential cultural adaptations.

**Defining Local Treatment Systems on a Geographic Basis**

For the purpose of this project, planning regions have been identified as the health regions/authorities/districts (referred to as health regions) within each of the provinces/territories (P/Ts) across Canada. We have made the assumption that substance use service planning is done on a geographic basis, which puts boundaries on the populations being served. This assumption was validated by our baseline survey which noted that in the majority of the P/Ts that are divided...
into health regions, substance use planning is performed at the regional level; whereas the P/Ts that have centralized health care systems (e.g., PEI, Alberta) plan their substance use services at the P/T level (CAMH, 2011). In applying the model to each individual health planning region, other needs assessment information can be brought to bear in the planning process. The 87 health planning regions used for the purposes of this project are shown in Appendix C. These planning regions may change in the future, requiring updating of the data being developed.
References


Barry, K.L. (1993). *Substance Abuse and Mental Health Services Administration/Centre for Substance Abuse Treatment Improvement Protocols: Treatment Improvement Protocol Series 34: Brief Interventions and Brief Therapies for Substance Abuse*. Substance Abuse and Mental Health Services Administration, Maryland, USA.


Appendix A: Research Team and National Advisory Committee members

National Advisory Committee:

Carol Hopkins, National Native Addictions Partnership Foundation, Muskoday, Saskatchewan

David Brown, Evaluation Consultant, Winnipeg, Manitoba

Gina Rideout, Department of Health and Community Services, St. John’s, Newfoundland

Heather Bullock, Centre for Addiction and Mental Health, Toronto, Ontario

Jesse Jahrig, Alberta Health Services, Edmonton, Alberta

John Topp, Pavillon Foster, St-Philippe-de-Laprairie, Québec

Nadine Blanchette-Martin, Centre de réadaptation Ubald-Villeneuve (CRUV) and Centre de réadaptation en dépendance de Chaudière-Appalaches, Québec

Rebecca Hansen, Alcohol and Drug Services, Whitehorse, Yukon

Rebecca Jesseman, Canadian Centre on Substance Abuse, Ottawa, Ontario

Sherry Mumford, Addiction Services and Langley and Maple Ridge Mental Health, British Columbia

Terry Gudmundson, Ministry of Health, Saskatchewan

Project Research Team:

Project Lead: Brian Rush, Centre for Addiction and Mental Health, Toronto, Ontario

Quebec Lead: Joël Tremblay, Université du Québec à Trois-Rivières, Québec

Project Coordinator: Renée Behrooz, Centre for Addiction and Mental Health, Toronto, Ontario

Project Coordinator: Chantal Fougere, Centre for Addiction and Mental Health, Toronto, Ontario

Research Analyst: Wendi Perez, Centre for Addiction and Mental Health, Toronto, Ontario
Appendix B: Logic Model – Development of Needs-Based Planning Models for Services and Supports in Canada

Components

Model Development
Develop a needs-based planning model for specialized substance use services and supports.

Model Expansion
Expand the needs-based planning model to estimate the needs of special populations.

Model Expansion
Expand literature review to those populations missed in the national survey data

Pilot Testing and Model Enhancements
Pilot and evaluate the needs-based model to refine & share with engaged jurisdictions across Canada.

Evaluation, Project Management and Dissemination
Manage and evaluate the project and share lessons learned.

Activities

- Undertake literature review and access reviews from other DTFP projects
- Apply current data on use of services to begin to populate the initial model and supplement with secondary data sources
- Define and model components, pathways & parameters of service use in the ideal treatment system
- Analyze available hospital & emergency services data in Quebec

- Literature review
- Secondary data report
- Mapping report: Specialized sector, mental health, and primary care
- Planning model and toolkit for application

- Literature review - expanded
- Data analysis reports
- Secondary data report
- Expanded planning model and toolkit
- Recommendations

- Protocol for pilot testing
- Revised planning model and toolkit
- Recommendations

- Incorporate into pilot sites the qualitative evaluation data collection component
- Progress monitoring
- Coordinate with DTFP projects
- Develop recommendations for application of model beyond present project life cycle
- Use knowledge exchange networks to disseminate information

Outputs

- Literature review
- Secondary data report
- Mapping report: Specialized sector, mental health, and primary care
- Planning model and toolkit for application

- Literature review - expanded
- Data analysis reports
- Secondary data report
- Expanded planning model and toolkit
- Recommendations

- Protocol for pilot testing
- Revised planning model and toolkit
- Recommendations

- Evaluation plan
- Evaluation report
- Dissemination toolkits
- Communication updates and websites

Immediate Outcomes

Increased access to models and toolkits for needs-based planning and allocating resources for substance use services and supports.

Intermediate Outcomes

Increased awareness and engagement of decision-makers concerning needs-based planning models and their relative advantage over existing approaches.

Longer-Term Outcomes

- Across Canadian jurisdictions, increased use of needs-based planning models for substance use services.
- Increased ability to systematically allocate resources to better meet needs of individuals accessing services in all relevant health sectors.
- Improved decisions for resource allocation for substance use services and systems.

Strengthened evidence-informed substance abuse treatment systems including:
- Client level outcomes such as reduced harms associated with substance use and improved health and quality of life outcomes;
- System level outcomes such as better balance in continuum of care, improved continuity of care, increased penetration to in-need populations, and improved population health outcomes.

Legend

Project-level outcomes
DTFP-level outcomes
## Appendix C: Category definitions and CCHS 1.2 variables

<table>
<thead>
<tr>
<th>Tier 1</th>
<th>Definition</th>
<th>Code</th>
<th>Corresponding Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tier 1</td>
<td>Maximum Alcohol use is 5+ drinks in one occasion &lt;1/mon &lt;AND&gt; Maximum Drug use is &lt;1/mon for each drug</td>
<td>max_alc_drug_freq = 0</td>
<td>Abstainer, light, moderate, &lt;1/mon</td>
</tr>
<tr>
<td></td>
<td>-AND- 0 Alcohol problems -AND- 0 Drug problems</td>
<td>AND (max_alc_drug_prob=0 OR missing(max_alc_drug_prob))</td>
<td>no problems</td>
</tr>
<tr>
<td>Tier 2</td>
<td>(Alcohol use is 5+ drinks in one occasion 1+/mon &lt;OR&gt; Drug use is 1+/mon for any one drug) &lt;AND&gt; 1 to 3 (of 12) Alcohol problems OR 1 to 3 (of 8) Drug problems &lt;AND&gt; does NOT meet DSM criteria for Alcohol dependence &lt;AND&gt; does NOT meet DSM criteria for Drug dependence</td>
<td>(max_alc_drug_freq = 1 OR max_alc_drug_prob=1)</td>
<td>Heavy user, 1+/mon</td>
</tr>
<tr>
<td></td>
<td>OR max_alc_drug_prob=1</td>
<td>no problems</td>
<td></td>
</tr>
<tr>
<td>Tier 3</td>
<td>4 or more (of 12) Alcohol problems &lt;OR&gt; 4 or more (of 8) Drug problems</td>
<td>max_alc_drug_prob=2</td>
<td>4+ problems</td>
</tr>
<tr>
<td></td>
<td>-OR- Meets DSM criteria for Alcohol dependence -OR- Meets DSM criteria for Drug dependence</td>
<td>OR meet_alc_drug_dependence=1</td>
<td>meets alcohol/drug dependence</td>
</tr>
<tr>
<td>Tier 4</td>
<td>Meets criteria for Tier 3</td>
<td>Meets Tier 3</td>
<td>Needed help emotions/didn't receive it</td>
</tr>
<tr>
<td></td>
<td>-AND- (During the past 12 months, was there ever a time when you felt that you needed help for your emotions, mental health or use of alcohol or drugs, but you didn't receive it?)</td>
<td>AND (SERB_A3=1)</td>
<td>yes service use</td>
</tr>
<tr>
<td></td>
<td>-OR- Used formal services in the past 12 months</td>
<td>OR UTIL12M_rmv4informal=1</td>
<td>yes service use</td>
</tr>
<tr>
<td></td>
<td>-OR- Has a positive Alcohol interference flag - OR- Has a positive Drug interference flag</td>
<td>OR alc_drug_interference=1</td>
<td>interference</td>
</tr>
<tr>
<td>Tier 5</td>
<td>Meets criteria for Tier 4</td>
<td>Meets Tier 4</td>
<td></td>
</tr>
<tr>
<td></td>
<td>-AND- Meets DSM criteria for &gt;=2 (of 5) Mental Health diagnoses (Major Depression, Manic Episode, Panic, Social Phobia, Agoraphobia without Panic)</td>
<td>AND twoplus_mental_cond=1</td>
<td>yes</td>
</tr>
<tr>
<td></td>
<td>-AND- &gt;=1 of 5 Mental Health interference flag</td>
<td>AND oneplus_MH_interference=1</td>
<td>yes</td>
</tr>
<tr>
<td></td>
<td>-AND- has a physical or mental condition that reduces ability sometimes/often in 1 of 4 areas (home, work, school, leisure)</td>
<td>AND oneplus_act_limited=1</td>
<td>yes</td>
</tr>
</tbody>
</table>
## Appendix D: Health Planning Regions in Canada

<table>
<thead>
<tr>
<th>Province/Territory</th>
<th>Number of Health Authorities</th>
<th>Health Authorities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alberta*</td>
<td>1</td>
<td>Alberta Health Services</td>
</tr>
<tr>
<td>British Columbia</td>
<td>5</td>
<td>Fraser Health, Interior Health, Northern Health, Vancouver Island Health Authority, Vancouver Coastal Health</td>
</tr>
<tr>
<td>Manitoba</td>
<td>11</td>
<td>Assiniboine RHA, Brandon RHA, Burntwood RHA, Central Manitoba RHA, Churchill RHA, Interlake RHA, NOR-MAN RHA, North Eastman RHA, Parkland RHA, South Eastman RHA, Winnipeg RHA</td>
</tr>
<tr>
<td>New Brunswick</td>
<td>2</td>
<td>Vitalité Health Network, Horizon Health Network</td>
</tr>
<tr>
<td>Newfoundland and Labrador</td>
<td>4</td>
<td>Eastern RHA, Central RHA, Western RHA, Labrador/Grenfell RHA</td>
</tr>
<tr>
<td>Northwest Territories</td>
<td>8</td>
<td>Beaufort-Delta HSSA, Dehcho HSSA, Fort Smith HSSA, Hay River HSSA, Sahtu HSSA, Stanton Territorial Health Authority, Tlicho Community Services Agency, Yellowknife HSSA</td>
</tr>
<tr>
<td>Nova Scotia</td>
<td>9</td>
<td>Annapolis HA, Cape Breton DHA, Capital Health, Colchester East Hants HA, Cumberland HA, Guysborough Antigonish Strait HA, Pictou County HA, South Shore HD, South West HD</td>
</tr>
<tr>
<td>Nunavut*</td>
<td>1</td>
<td>Department of Health and Social Services</td>
</tr>
</tbody>
</table>

*In addition to the local health authorities, we consider each individual province/territory a planning region as well.*
<table>
<thead>
<tr>
<th>Province/Territory</th>
<th>Total Regions</th>
<th>Responsible Body/Agency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ontario</td>
<td>14</td>
<td>Erie St Clair LHIN</td>
</tr>
<tr>
<td></td>
<td></td>
<td>South West LHIN</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Waterloo Wellington LHIN</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Hamilton Niagara Haldimand Brant LHIN</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Central West LHIN</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mississauga Halton LHIN</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Toronto Central LHIN</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Central LHIN</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Central East LHIN</td>
</tr>
<tr>
<td></td>
<td></td>
<td>South East LHIN</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Champlain LHIN</td>
</tr>
<tr>
<td></td>
<td></td>
<td>North Simcoe Muskoka LHIN</td>
</tr>
<tr>
<td></td>
<td></td>
<td>North East LHIN</td>
</tr>
<tr>
<td></td>
<td></td>
<td>North West LHIN</td>
</tr>
<tr>
<td>Prince Edward Island*</td>
<td>1</td>
<td>Department of Health and Wellness</td>
</tr>
<tr>
<td>Quebec</td>
<td>18</td>
<td>Bas-Saint-Laurent</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Saguenay-Lac-Saint-Jean</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Capitale-Nationale</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mauricie et Centre-du-Québec</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Estrie</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Montréal</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Outaouais</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Abitibi-Témiscamingue</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Côte-Nord</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nord-du-Québec</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Gaspésie-Iles-de-la-Madeleine</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Chaudière-Appalaches</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Laval</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lanaudière</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Laurentides</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Montérégie</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Nunavik</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Terres-Cries-de-la-Baie-James</td>
</tr>
<tr>
<td>Saskatchewan</td>
<td>12</td>
<td>Cypress RHA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Five Hills RHA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Heartland RHA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Keewatin Yathé RHA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Kelsey Trail RHA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Mamawetan Churchill River RHA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Prairie North RHA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Prince Albert Parkland RHA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Regina Qu’Appelle RHA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Saskatoon RHA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sun Country RHA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Sunrise RHA</td>
</tr>
<tr>
<td>Yukon*</td>
<td>1</td>
<td>Department of Health and Social Services</td>
</tr>
<tr>
<td>TOTAL (Health Regions)</td>
<td>87</td>
<td></td>
</tr>
<tr>
<td>Total (Health Regions plus Provinces/Territories)</td>
<td>100</td>
<td>* The province/territory’s health system is centralized</td>
</tr>
</tbody>
</table>
Appendix E: Pilot Site Descriptions

1. Fraser Health, British Columbia provides a wide range of integrated health care services to more than 1.5 million people living in communities stretching from Burnaby to White Rock to Hope, and offers a fairly urban perspective on substance use services and planning. The communities served by Fraser Health include approximately 38,100 First Nations people, and large Asian, Indo-Canadian and Filipino populations. Fraser Health provides substance use services including prevention (e.g., needle exchange); outpatient programs (e.g., group support, case management); residential programs (e.g., support recovery homes); and withdrawal management (e.g., medical withdrawal management, stabilization beds).

2. Northern Health, British Columbia Northern Health covers almost two-thirds of British Columbia, is home to approximately 300 000 people, where approximately 18% of the population is Aboriginal – the highest proportion in the province. Substance use services are available for youth, adults and the elderly, and Northern Health provides a wide range of substance use services in a variety of community and residential settings. Services vary from short-term assessment and treatment to long-term programs for those with a serious and persistent mental illness and/or substance abuse problems.

3. Province of Saskatchewan is home to approximately 1 million people and offers both an urban and rural perspective on substance use services. Approximately 15% of Saskatchewan’s population identifies as Aboriginal. Substance use services in Saskatchewan are provided by the province’s 12 Regional Health Authorities, and include detoxification services (e.g., stabilization); inpatient services (e.g., intensive support services); long-term residential services (e.g., life skill training); and outpatient services (e.g. counseling, screening and assessment).

4. Province of Prince Edward Island is home to approximately 142 266 people, and offers both an urban and rural perspective on substance use services and planning at the provincial level. Community-based substance use services are provided on an outpatient basis, and inpatient and outpatient treatment are both offered at the Provincial Addictions Treatment Facility. A continuum of services is provided in PEI, including assessment and referrals, family programs, inpatient and outpatient detoxification and early intervention programs.
5. Nova Scotia  text to be added
Appendix F: Approximate Population (Ages 15 and over) living on Reserves in Canada

As per the Department of Indian Affairs and Northern Development (DIAND) (2011) the total population of First Nations people, ages 15 and over, living on reserves across Canada is approximately 326,284 people.

As per the DIAND, a reserve is defined as a tract of land, the legal title to which is vested in Her Majesty, which has been set apart by Her Majesty for the use and benefit of a band (DIAND, 2011). As of December 31, 2010, there were 3117 reserves across Canada, not all of which are inhabited (DIAND, 2011).

Note: This data was obtained from the DIAND, and as per their organization, this data set describes the populations of Indians registered as of December 31, 2010. However, the Indian Register does not include all persons who are entitled to be registered according to the Indian Act, but only includes those who have applied for registration, and who have been verified. Therefore, the data from the Indian Register may not be entirely accurate, as new children may not be added for a year, and deceased people can remain on the register after their death.
Appendix G: Approximate Population of Homeless People in Canada

For the purpose of this project, many different sources were used to determine the approximate homeless population of major cities in Canada, with no defined age parameters in place. Our most current approximation of the Canadian homeless population is 14,467 people.

The Canadian homeless population estimates were derived from a variety of sources, such as regional Report Cards on Homelessness, housing adequacy studies, and homeless needs surveys and censuses.

It is noted that the definition of homeless varied widely along with the different data sources used. Some sources defined homeless populations as “absolute homeless (staying in shelter) and relative homeless (unsafe housing, inadequate; too expensive)”, whereas other sources defined homeless in terms of “no place of their own where they could expect to stay for more than 30 days and if they did not pay rent; unsheltered - found on the streets and/or drop-in centres; sheltered- in shelter, safe house, hospital, jail, detox”.