Diego S. Silva

Tuberculosis and Persons with Severe and Persistent Mental Illnesses: When (Treatment) Worlds Collide?
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By
Diego S. Silva

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Abstract
Tuberculosis (TB) disproportionately affects persons of lower socioeconomic status, including persons with severe and persistent mental illnesses (SPMI). Persons with SPMI often suffer from comorbidities and are sometimes homeless, both of which might increase their likelihood of contracting TB. Antitubercular drugs may also affect the efficacy of antipsychotic medication, while extending periods of respiratory isolation may make it difficult to maintain proper psychosocial support.

The treatment of TB in persons with SPMI brings into sharp relief the potential for disparate treatment goals between public health and mental health. While the goal of public health is often construed as protecting the public from diseases and promoting health at the level of populations, mental health is often focused on the empowerment and increasing the autonomy of persons with SPMI. In the case of TB and SPMI, such goals may conflict. The question then is how to address such conflict, if and when it should arise.

The goal of this paper is to provide an overview of TB in persons with SPMI and begin to consider some of the ethical issues surrounding the treatment of TB in persons with SPMI.

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INTRODUCTION
Public health, as a field of practice or research, is concerned with the health of the public, or the individuals that comprise the public and different populations (Verweij and Dawson 2007). Apart from being a tautology, this skeletal definition of public health denotes what it is not, namely, concerned with the health of individuals as individuals. Interest in an individual’s health is often considered the domain of the individual him- or herself and that of clinical medicine. Mental health, in particular the care of persons with psychiatric illnesses, has traditionally been concerned with the well-being of individuals themselves (Musto 2009; Porter 2002). The focus on the social well-being of the individual, along with her or his psychiatric status, in mental health is often considered a means of personal empowerment through the protection and enforcement of civil liberties, as well as a means of combating the stigma and discrimination that persons with mental illnesses face in general society (Stein and Santos 1998). Whether this aspiration of mental healthcare is practiced in the context of Ontario or beyond is an important question, but one that, for the purposes of this paper, I will set aside.
The reason I raise the differences in focus or goals of public health and mental health is to argue that, at least *prima facie*, there is a difference in scope and approach to caring for the health of people. Public health begins with concern for *macro*-health and only then moves toward concern for individual members of a group or population; conversely, mental health begins with its focus on the health and well-being of individuals, i.e. *micro*-health. Perhaps the differences between public health and mental health are not that stark in practice. The extent to which differences exists is an empirical question. Prior to answering the empirical question, an analysis of the literature with regards to each field of practice is necessary. As such, this paper will begin to explore the treatment of persons with tuberculosis (TB) in persons with severe and persistent mental illnesses (SPMI) as a case study for public health and mental health more broadly. This case has been chosen because there can be difficulties in treating TB in persons with SPMI, difficulties that illustrate different treatment worlds. In particular, I will pay close attention to the issue of harm to others and self as a means of publically prohibiting certain actions (e.g., isolation due to risk of infection or violence) in the context of TB and mental health in Ontario in order to feasibly begin to answer the broader question with regard to public health and mental health raised above.

The goal of this paper is modest: first, to provide some background regarding the problem of TB and persons with SPMI, and second, to demonstrate the possible challenges associated to the treatment of TB in persons with SPMI as a case study of the possible tension that exists between public health and mental health thinking and practice. I will present some background material (including epidemiology, history, and treatment) regarding TB and SPMI before identifying some areas of potential conflict in treatment.

**TUBERCULOSIS**

**Bacteriology, Epidemiology, and Treatment**

*Mycobacterium tuberculosis* is a bacterial infection that can live only in human hosts and affects a human’s lungs, as well as other organs. TB is transmitted through the inhalation of airborne droplets expelled through an infected person coughing, sneezing, or spitting. Of those humans infected with TB globally, approximately 95% will not become diseased and 85% will maintain a lifetime of latent, asymptomatic TB. The probability of developing active TB is higher in immuno-compromised individuals, e.g., 37% of persons with HIV/AIDS develop TB within five months of exposure. TB that affects the lungs is the primary source of morbidity. Although the rate of transmission varies between the different strains of TB and is greater from persons with active TB than those with the latent form, transmission is also dependent upon environmental factors. Since TB particles have a slow setting rate once airborne (i.e., the rate at which particles descend after emission), poor air circulation and the proximity between an infected agent and other humans in damp, humid locations increases the likelihood of transmission. TB particles do not survive once lodged in inanimate objects, such as tables or chairs, or in dry locations and in the presence of direct sunlight. The circulation of fresh air in a building’s ventilation system decreases the amount of TB particles in a given indoor air space and subsequently decreases the probability of transmission (Public Health Agency of Canada 2007).

Globally, in 2008, there were an estimated 9.4 million incident cases (139 cases per 100,000 population) and 11.1 million prevalent cases (164 cases per 100,000) of active TB. Of the incident cases, approximately 1.5 million TB infectious disease cases occurred in persons who were HIV-positive. Most of the incident cases occurred in Asia (55%) and Africa (30%). Approximately 1.3 million HIV-negative persons died from TB in 2008; an additional 500,000 of fatalities caused by TB were observed in persons who were also HIV-positive. Most cases of active TB leading to morbidity and mortality occurred in lower income countries (World Health Organization 2009). In Canada, the incident rate of TB is much lower than the global rate; in 2008, there were 1,600 (4.8 per 100,000 population) new active and retreatment cases across the country. Of note, during 2008, 62% of all incident cases in Canada were from foreign-born persons, while Aboriginal Canadians accounted for 21% of reported cases. The rate of TB in Aboriginal persons was almost six times higher than that of the general Canadian population (Ellis et al. 2009).

As one can begin to deduce from the epidemiological data, TB disproportionately affects persons of lower socioeconomic status (SES) and is described as a “disease of poverty” (World Health Organization 2009).
Persons of lower SES (e.g., persons who are homeless) often suffer from physiological conditions (e.g., HIV/AIDS) and live in social situations (e.g., shelters) that enable easier TB transmission and increase their susceptibility of having an active case (Gostin 1993; Lopez 1994). For example, poor standards of ventilation and the proximal living conditions of persons using homeless shelters led to an outbreak of TB in this population in the late 1980s in New York City (Bayer and Dupuis 1995).

Treating cases of active TB and reducing the rate of transmission require both public health and pharmacological responses. In terms of public health goals, domestic and international healthcare systems have certain responsibilities. Domestically, governments provide the legislative and regulatory structures, and laboratory and surveillance capabilities, to track and manage active cases. Internationally, information on new drug-resistant strains, as well as epidemiological information, is shared in order to treat the global burden of TB and to improve international standards of treatment and prevention. Pharmacologically, treatment of active TB with medication usually includes prescribing a combination of four drugs: isoniazid, rifampin, pyrazinamide, and ethambutol. A first-time standard course of treatment runs between six and 24 months and until the patient's sputum is clear of bacteria (Public Health Agency of Canada 2007). A patient who is deemed likely to comply with TB treatment is often required to remain in voluntary respiratory isolation until they are considered non-infectious (Ontario Ministry of Health and Long-Term Care 2008), where “respiratory” isolation denotes arresting the transmission of airborne particles by any plausible means (e.g., wearing an N95 mask)(Public Health Agency of Canada 2007). Usually, persons are found non-infectious for TB after two weeks. Although a person with active TB is most likely to infect others prior to treatment and during the first two months of treatment (Ontario Lung Association 2009), TB is communicable as long as bacteria remains in a person's sputum (Lederberg, Oaks, and Shope 1992). The goal of drug treatment is two-fold: first, to treat (and hopefully cure) a person from his or her active TB, and second, to use clinical treatment as a public health strategy toward arresting the exposure and transmission of TB (Public Health Agency of Canada 2007).

TB drug regimens, however, have two main problems, which lead to poor completion rates and raise a host of additional public health challenges. First, the drugs used to treat TB often have adverse reactions, including hepatotoxicity, renal toxicity, and neuropathy; of particular interest for this paper, a rare adverse reaction to isoniazid includes psychotic episodes. Second, due to the length of course of treatment and the possibility for adverse reactions, persons with active TB often fail to finish their prescribed course of treatment, which has led many TB researchers to postulate that non-adherence to treatment is responsible for the rise of multidrug-resistant tuberculosis (MDR-TB) and extensively drug-resistant tuberculosis (XDR-TB) (Public Health Agency of Canada 2008, 2007; World Health Organization 2009).

Before describing M/XDR-TB, it is important to discuss public health's response to non-adherence to TB drug treatment, namely the use of Directly Observed Therapy (DOT). DOT (or DOTS where the “s” stands for “short-course,” when short-course chemotherapy treatment is indicated) consists of a public health practitioner or healthcare worker actually observing a person with TB swallow his or her requisite pills. The place of supervision is determined on a case-by-case basis and should be as least disruptive of the patient's life as possible (World Health Organization 2006). Some studies suggest that treatment completion rates reach 90% with the use of DOT (Blumberg, Leonard, and Jasmer 2005); hence the World Health Organization endorses DOT as a standard course of treatment for everyone requiring TB treatment (World Health Organization 2006). In Canada, due to the differing levels of resources that provinces and public health units may have, TB specialists recommend using DOTS preemptively and for the full duration of drug treatment when a person with TB falls within a population with historically poor treatment adherence, including persons who are homeless or have psychiatric illnesses (Public Health Agency of Canada 2007; Ontario Ministry of Health and Long-Term Care 2008). Despite the recommendations of the WHO and other scientists, some researchers have argued that the evidence regarding the effectiveness of DOT remains inconclusive (Verma et al. 2004). Finally, if someone is non-adherent even when participating in a DOT program, i.e., refuses to adhere to TB treatment despite the best efforts of public health officials, then some jurisdictions, including Ontario, have laws that allow for the involuntary detention of such persons for the

As mentioned above, the reason there is such an emphasis on adherence to TB treatment is because of the morbidity associated to TB and because the TB bacteria mutates and develops varying degrees of drug resistance. MDR-TB is any TB strain that is resistant to isoniazid and rifampicin (the two most important first-line drugs), where resistant bacteria is acquired externally or develops from pre-existing non-drug-resistant strains in a particular individual. MDR-TB is treated through DOT and the combined use of fluoroquiolone and second-line anti-TB injectable drugs (amikacin, kanamycin, and capreomycin). XDR-TB is defined as TB bacteria resistant to isoniazid, rifampicin, some fluoroquinolone, or second-line anti-TB injectable drugs; treatment of XDR-TB is limited to using any fluoroquinolone and any second-line anti-TB injectable drugs that are not deemed resistant upon laboratory confirmation of bacterial strains (*World Health Organization* 2010; *Public Health Agency of Canada* 2008).

Globally, there were an estimated 440,000 incident cases of MDR-TB in 2008, which represented approximately 3.5% of all active TB cases. Of the approximately 150,000 deaths globally in 2008, most cases of MDR-TB occurred in Eastern Europe and Central Asia. Approximately 5.4% of MDR-TB cases are XDR-TB (*World Health Organization* 2010); one study from Korea places the mortality rate for XDR-TB at 48% (Jeon et al. 2009). Despite these figures, there has been a global decrease in MDR-TB, attributed to early identification and aggressive treatment (*World Health Organization* 2010). MDR-TB is not considered more virulent than non-drug-resistant TB (*Public Health Agency of Canada* 2007). Risk factors for M/XDR-TB are similar to the risk factors associated with non-drug-resistant TB. In Canada, up to and including 2008, there were a total of 181 cases of MDR-TB, representing approximately 1% of all TB cases between 1998 and 2008; there were four cases of XDR-TB in Canada during that time (*Public Health Agency of Canada* 2008). It is important to note that the rise of M/XDR-TB is not limited to non-adherence to TB treatment that has led to bacterial mutation, but is also a result of “poor infection control practices in congregate setting” like homeless shelters (*Raviglione* 2006, 1185). M/XDR-TB has been described as a tragic result of human complacency and failure regarding TB treatment (*Upshur* 2010; *Coker* 2004).

In terms of relevant adverse effects of second-line drugs, cycloserine (usually given in conjunction with other drugs) may result in psychotic episodes and is contraindicated for persons with depression, severe anxiety, or psychosis (*World Health Organization* 2006). More interesting than the adverse effects of cycloserine is the WHO’s recommendation vis-à-vis the medication: the organization states that if cycloserine is important for TB treatment in a particular case and the patient has a history of psychiatric illness “the benefits of using this drug may outweigh the potentially higher risks of adverse events” (ibid.). The WHO’s position invites the question, For whom does the benefits outweigh the risk: the patient or the general public? Moreover, the WHO insists that if a patient develops signs of psychosis, then cycloserine should be discontinued “if this can be done without compromising [TB] regimen” (ibid., 79). It appears that greater deference is given to the protection of the public from M/XDR-TB than the psychiatric well-being of the patient, if no other alternatives exist. Whether this is a morally appropriate recommendation from the WHO requires further investigation.

**Health Protection and Promotion Act (HPPA)**

The Health Protection and Promotion Act (HPPA), along with relevant regulations, provides the legislative framework for infectious disease control in Ontario (*Health Protection and Promotion Act*, R.S.O. 1990, Chapter H.7; *Health Protection and Promotion Act*, R.R.O 1990, Regulation 569; *Health Protection and Promotion Act*, O. Reg. 558/91; *Health Protection and Promotion Act*, O. Reg. 559/91). The HPPA classifies infectious diseases by three categories, in descending order of possible harm: virulent, communicable, and reportable. All virulent diseases are also classified as communicable, and all communicable are reportable. TB is considered only one of 12 virulent diseases. Two sections of the HPPA are worth noting. Section 22(1) allows that a medical officer of health (MOH) “by a written order may require a person to take or refrain from taking any action… in respect of a communicable disease,” which may include, as articulated in s.22(4):
c) requiring any person that the order states has or may have a communicable disease or is or may be infected with an agent of a communicable disease to isolate himself or herself and remain in isolation from other persons;

(f) requiring the person to whom the order is directed to submit to an examination by a physician and to deliver to the medical officer of health a report by the physician as to whether or not the person has a communicable disease or is or is not infected with an agent of a communicable disease;

(g) requiring the person to whom the order is directed in respect of a communicable disease that is a virulent disease to place himself or herself forthwith under the care and treatment of a physician;

(h) requiring the person to whom the order is directed to conduct himself or herself in such a manner as not to expose another person to infection. (Health Protection and Promotion Act, R.S.O. 1990, Chapter H.7; emphasis added.)

Section 22, then, is essentially a letter given to someone with a communicable disease who has not been abiding by public health orders and must fulfill certain requirements. In particular, note that an order under s.22 allows an MOH to require an individual to remain in isolation and to be examined by a physician if the disease is communicable, but submit to treatment if the disease is virulent.

The second relevant section of the HPPA is s.35, whereby an MOH can ask the court (s.35(1)) to take into custody and detain for the purposes of examination or treatment any person suspected or known to have a virulent disease (s.35(3)(a,b,c)) for a period of no more than six months (s.35(7)) if that person failed to comply with an order from an MOH to remain in isolation or submit to examination or treatment by a physician (s.35(2)(a,b,c)). Section 35(7.1)(a,b) states that the Health Care Consent Act, 1996 does not apply to persons under examination or treatment of a virulent disease (Health Protection and Promotion Act, R.S.O. 1990, Chapter H.7). There are two important differences between s.22 and s.35. First, s.22 is an order whereas s.35 allows for involuntary detention. Second, s.22 applies to both communicable and virulent diseases whereas s.35 applies only to virulent diseases. It is important to note that in both s.22 and s.35 of the HPPA, an MOH may order not merely isolation but treatment of persons with virulent diseases like TB. It is unclear whether s.35 of HPPA, which permits a member of the executive branch of government (e.g., the MOH) to treat a person involuntarily, would violate s.7 of the Constitution Act, 1982 (i.e., The Canadian Charter of Rights and Freedoms), which guarantees the right to “security of person” and thus be considered ultra vires (i.e., sections or entire statues that exceed their legislative scope) (The Constitution Act, 1982, being Schedule B to the Canada Act 1982 (U.K.), 1982, c. 11.). Regardless, the ethical question remains whether it is right to treat someone against his or her will when in extreme cases forcible detention is sufficient to protect the public from disease transmission.

Tuberculosis Policy in Ontario and Canada

The three levels of government (i.e., federal, provincial, and municipal) share the responsibility of developing legislation and policy to regulate the surveillance, prevention, and treatment of TB in Canada (Public Health Agency of Canada 2007). Federally, the Public Health Agency of Canada provides standards and recommendations for the provinces and acts as an intermediary on issues of surveillance and epidemiology between the provinces and the international public health community (ibid.). In Ontario, the HPPA provides the legal foundation for tuberculosis control and policy. In addition, Ontario has published a Tuberculosis Prevention and Control Protocol intended to “identify the minimum [mandatory] expectations for public health program and services” at the local level in order to comply with the HPPA (Ontario Ministry of Health and Long-Term Care 2008). Boards of health can exceed this protocol when local officials feel there are specific population needs that require further support. Boards of health are required to abide by provincial law and protocol rules regarding operational roles and responsibilities, surveillance, identification and management of active and latent TB cases, and managing the contacts of persons infected with TB (ibid.). Finally, the Ontario Lung Association, in conjunction with the Province of Ontario, has recently produced a detailed information manual for frontline healthcare workers; this document outlines
the basic epidemiology, modes of transmission, screening, diagnosis, treatment, and reporting requirements for active and latent forms of TB (Ontario Lung Association 2009).

**MENTAL HEALTH AND SEVERE AND PERSISTENT MENTAL ILLNESS**

**Brief History of Mental Healthcare and Psychiatry**

Although the history of psychiatry is complex and multifaceted, certain historical events can help situate current trends in mental healthcare. Generally, persons with mental health illnesses have been subjected to intense stigma and discrimination throughout history and across geography. “Madness” was once attributed to a person’s religious failings in parts of the Western world, and care for persons with mental illnesses fell upon family members who were often ashamed of their afflicted relatives and tried to help their loved ones through prayer. During the Middle Ages in Europe, hospitals that tended to psychiatric patients proliferated, and while they often preached empathy and pity toward patients, those persons institutionalized were treated predominately as children with little to no rights or responsibilities (Porter 2002; Musto 2009; Shorter 1997).

There exist at least two historical moments in Western mental healthcare of note for the purposes of this paper. The first event to help shape modern mental healthcare was the Enlightenment, with its emphasis on using rational thought over emotions and mythic religious teachings. René Descartes posited that the world was made up of material objects, like the human body, and incorporeal objects, like the mind (the mind being considered the seat of rationality and morality). However, the mind controlled the body through the pineal gland, thus connecting the material and the immaterial world. This and similar dualistic models of the human gave rise to the notion that persons with mental illnesses lacked the ability of rational thought, the ability to control emotion, and subsequently, the ability to distinguish right from wrong, i.e., an inability to be moral beings (Porter 2002). In eighteenth-century France, the cause of mentally ill persons’ stunted reason was often deemed social in nature (Musto 2009). Regardless of the cause, if “insanity was a mental disorder, it had to be relieved through mental approaches” not through prayer or spiritual reformation (Porter 2002, 58). This approach, popularized by the French physician Philippe Pinel during the height of the French Revolution’s philosophical emphasis on individual liberty, stated that treatment of persons with mental illnesses should be based on reason and should use restriction only when absolutely necessary and as a last resort (Porter 2002; Musto 2009; Shorter 1997).

The second pertinent historical moment in Western mental healthcare — deinstitutionalization — occurred in the 1960s with the civil rights movement in the United States and Canada, but can be traced as far back as the 1940s in the United Kingdom. Until then, most of mental healthcare was delivered in in-patient psychiatric institutions, whose original intent was to treat persons with mental illnesses in a burgeoning medico-psychiatric model. Around the late 1950s, mental health advocates and politicians called for deinstitutionalization, which meant that care for persons with mental illnesses would no longer fall under the auspices of the federal or local governments. For many, this was a practical move that was intended primarily to save taxpayers’ money; for others, deinstitutionalization was seen as a means of normalizing mental illness and affording marginalized persons the civil rights that were being won by African Americans/Canadians and women (Shorter 1997; Porter 2002).

The two important historical results — liberty and deinstitutionalization — continue to be relevant today. Respect for the liberty, individuality, and dignity of persons with mental illness remains an important component of the mental health field’s attempt to counter the general public’s stigma toward persons living with psychiatric conditions (Musto 2009; Porter 2002; Shorter 1997). However, there were no concrete plans made for community treatment after mass deinstitutionalization, i.e., former psychiatric in-patients were being discharged to their families or, more often, to the streets. This lack of post-institutionalized planning was the primary motivation for present-day community care models, including intensive community treatment (ICM) and assertive community treatment (ACT) for persons with SPMI (Stein and Santos 1998).
Severe and Persistent Mental Illness — Epidemiology and Treatment

A “mental illness,” as defined by the American Psychiatric Association, is “a clinically significant behavioral or psychological syndrome or pattern that occurs in an individual and that is associated with present distress… or disability… or with a significantly increased risk of suffering death, pain, disability, or an important loss of freedom” (DSM IV, xxxi). A mental illness does not refer to normative disagreements regarding an individual’s beliefs relative to his or her society, nor any distress commonly associated to life events (e.g., the death of a family member) (American Psychiatric Association 2000). An important part of the American Psychiatric Association’s definition of a mental illness is that it can be associated with a loss of freedom apart from any distress or physical or emotional disability. This emphasis on gaining, regaining, or maintaining personal freedom is in keeping with the more recent history of mental healthcare.

The notion of a “severe and persistent mental illness” is difficult to define because there is a lack of consensus as to the parameters of the term (Schinnar et al. 1990; personal correspondence with Dr. Mona Gupta, 12 January 2010). The Ministry of Health and Long-Term Care in Ontario has defined SPMI via three dimensions: disability (i.e., inability of a person to function in a daily life activity, for example, eating or bathing), duration (i.e., the SPMI is both acute and chronic), and diagnosis (i.e., primarily persons suffering from schizophrenia, mood disorders, organic brain syndrome, and other forms of paranoia and psychosis) (Ontario Ministry of Health 1999). A more recent definition of SPMI that has gained traction in the literature (Parabiaghi et al. 2006) evolved from the National Institutes of Mental Health definition: a person has an SPMI when he or she requires treatment for two or more years for organic or non-organic psychosis and has a disability as measured by a Global Assessment of Functioning (GAF) score of 70 or below (Ruggeri et al. 2000). Two points of clarification. First, the term psychosis “refers to delusions, any prominent hallucinations, disorganized speech, or disorganized or catatonic behavior” (American Psychiatric Association 2000, 297). Second, the GAF is a tool intended to help clinicians judge an “individual’s overall level of functioning”; for a score of 70, to take the highest score possible under a definition of SPMI, disability occurs if there are “some mild symptoms or some difficulty in social, occupational, or school functioning, but generally [the person is] functioning pretty well, [and] has some meaningful interpersonal relationships” (ibid., 34). Despite the requisite presence of long-term psychosis, a GAF score of 70 sets the threshold of disability low. One possible reason might be that this allows the treating healthcare worker on a given case a to exercise a “healthcare worker's prerogative,” thereby being overly inclusive at the risk of being exclusive for access to a particular form of treatment (personal correspondence with Dr. Mona Gupta, January 12, 2010). In practice, three psychiatric conditions usually fall within the scope of SPMI: schizophrenia, schizoaffective disorder, and bipolar disorder (Ruggeri et al. 2000; American Psychiatric Association 2000).

Despite the disagreements regarding the definitions and thresholds for what constitutes varying kinds of mental illnesses, Eaton and colleagues (2008) estimate that mental illnesses accounted for 21% of the total global burden of disease, with schizophrenia and bipolar disorder causing the greatest amount of disability amongst psychiatric conditions; only infectious diseases and cardiovascular disease had a greater burden of disease globally. Schizophrenia “is a disorder that lasts at least 6 months and includes at least 1 month of active-phase symptoms (i.e., two [or more] of the following: delusions, hallucinations, disorganized speech, grossly disorganized or catatonic behaviour, negative symptoms)” (American Psychiatric Association 2000, 297). Bipolar disorder is a mood disorder that is characterized by one or more occurrences of manic episodes (i.e., “an abnormally and persistently elevated, expansive, or irritable mood”) or mixed episodes (i.e., a combination of a manic episode and a major depressive episode) (ibid., 382). Schizophrenia and bipolar disorder each affect 1% of Canadians (Health Canada 2002) with similar prevalence rates globally (Mueser and McGurk 2004; Eaton et al. 2008). Onset of schizophrenia and bipolar disorder usually occur in early adulthood (Health Canada 2002) and are associated with other physical comorbidities, including obesity, substance abuse, and cardiovascular disease, as well as higher rates of suicide than in the general population (McGrath et al. 2008; Wilkins 2004). Persons with schizophrenia and bipolar disorder are usually of lower SES, though it is unclear the extent to which being of a lower SES increases the risk of succumbing to the
Treatments of the variety of SPMI illnesses generally combine pharmacological approaches with psychosocial therapy, the former chemically targeting the neurological dysfunction, and the latter aiming to improve a person psychological and social functioning by providing education and supports to help with day-to-day living. Assertive community treatment (ACT) was developed in the 1970s as response to both pharmacological and psychosocial needs. ACT is intended to be “a service delivery vehicle or system designed to furnish the latest, most effective and efficient treatments, rehabilitation, and support services conveniently as an integrated package” for persons with SPMI (Stein and Santos 1998, 75). In practice, this means that a healthcare team (constituted of nurses, social workers, psychologists, psychiatrists, vocational specialists, drug abuse specialists, and administrative assistants) collaborates intensively (e.g., provides support with recreation, employment, finances, etc.) with a roster of persons who suffer from SPMI (i.e., usually only persons with SPMI are eligible for ACT programs). The whole team works to support all the clients; this can be contrasted with intensive case management, for example, where one nurse or social worker is the primary point person for a list of clients. The intensive method of psychosocial treatment afforded by ACT means that only the persons with most severe mental illnesses, i.e. those who suffer from SPMI, are treated with this team approach. Intensive case management has similar goals to that of ACT, but with a pre-existing relatively self-sufficient clientele (Stein and Santos 1998; Ontario Ministry of Health and Long-Term Care 2004).

The goal of ACT programs is to “help persons with mental disabilities become integrated into their communities as individuals” (Stein and Santos 1998, 27; emphasis added). The founders of ACT claim that persons with SPMI “coveted their autonomy” and that “the people [ACT teams] are working with [clients who] are first and foremost citizens of the community… because it is their right” (ibid., 102).

Mental Health Act (MHA)

The Mental Health Act (MHA) is the primary source of Ontario legislation regarding the care and treatment of persons with psychiatric illnesses, including SPMI (Mental Health Act, R.S.O. 1990, Chapter M.7). Section 12 of the MHA grants anyone who requires psychiatric care or treatment voluntary or informal admission to a psychiatric facility (whereby “informal” means decisions taken via a substitute decision-maker). Voluntary admission assumes that a person is capable of wanting treatment, where a person is deemed capable “if the person is able to understand the information that is relevant to making a decision about the treatment… and be able to appreciate the reasonably foreseeable consequences of a decision or lack of decision” (Health Care Consent Act, S.O. 1996, Chapter 2, Schedule A). The MHA also allows for involuntary admission under certain conditions, the broadest which are found in s.20(5), which states that an attending physician, after examining a patient, may issue a certificate for involuntary admission for no more than two weeks without renewal (s.20(4)) if, pursuant to s.20(5):

(a) …the patient is suffering from mental disorder of a nature or quality that likely will result in,
   (i) serious bodily harm to the patient,
   (ii) serious bodily harm to another person, or
   (iii) serious physical impairment of the patient,

   unless the patient remains in the custody of a psychiatric facility; and

(b) that the patient is not suitable for admission or continuation as an informal or voluntary patient
   [i.e. the person is incapable of consenting to treatment and has no substitute decision maker].
   (Mental Health Act, R.S.O. 1990, Chapter M.7)

A non-psychiatrist physician may also apply for a psychiatric assessment under s.15(1) when he or she believes that a patient is a serious threat of bodily harm or physical impairment to the patient or others as a result of a psychiatric illness. Under s.20(1)(a,b,c), the physician who conducts the psychiatric exam shall (i.e., not “may”) admit involuntarily to treatment a patient if said patient has shown positive results to...
previous treatments for an illness that causes a serious threat of bodily harm or physical impairment to the patient or others and the patient is incapable of admitting him or herself to treatment. In summary, s.15 and s.20 of the MHA allows for involuntary treatment of a patient suffering from a psychiatric illness if the patient poses a serious threat of harm to him- or herself or others. In keeping with the historical trend of mental health toward protecting a client’s liberty, physicians cannot mandate treatment for therapeutic benefit alone.

Finally, s.33.1 of the MHA allows physicians to issue community treatment orders, whose purpose is:

- to provide a person who suffers from a serious mental disorder with a comprehensive plan of community-based treatment or care and supervision that is less restrictive than being detained in a psychiatric facility. A person who, as a result of his or her serious mental disorder, experiences this pattern: The person is admitted to a psychiatric facility where his or her condition is usually stabilized; after being released from the facility, the person often stops the treatment or care and supervision; the person’s condition changes and, as a result, the person must be re-admitted to a psychiatric facility. (Mental Health Act, R.S.O. 1990, Chapter M.7)

An extensive list of criteria for the order are enumerated in the MHA, including that the physician believes that a person without a community treatment order would decompensate and pose a serious threat of harm to him- or herself or others (s.33.1(4)(c)(ii)), that the person can abide by the requirements of the community treatment order (s.33.1(4)(c)(iv)), and that the person or their substitute decision-maker consent to the order (s.33.1(4)(f)). As opposed to s.15 or s.20 of the MHA, a community treatment order requires patient consent and contains the legal right to appeal the order (s.33.1(4)(e)); however, in practice, “[f]ailure to adhere to the treatment plan may trigger apprehension by the police and return to hospital for psychiatric evaluation” (Hunt et al. 2007, 651) and, as such, these orders may be seen as coercive and limiting the liberty of a person with SPMI to refuse. In Ontario, community treatment order user rates were estimated to be 17 per 100,000 population, with 37% of all orders issued in Toronto; persons usually suffered from schizophrenia (73.7%) or mood disorders (24.6%) (ibid.). Persons issued community treatment orders are often referred to ACT programs due to the severity of their conditions and the need to be monitored by a physician while in the community (O’Brien, Farrell, and Faulkner 2009).

Reforming Services for Persons with SPMI in Ontario

Starting in the 1980s, the Government of Ontario undertook to reform the mental healthcare delivery system in the province and, in later years, to evaluate the success of these reforms. Throughout the last 30 years, Ontario’s direction has been toward more community services that view clients as whole persons as opposed to persons with illnesses, coupled with viewing clients as individuals who have rights and should have a voice in how mental health services are delivered (Ontario Ministry of Health and Long-Term Care 2003). Much of the province’s reform centred on providing better supports for persons with SPMI. The first review, was the 1988 Graham Report, which stated that Ontario had done an inadequate job moving away from in-patient psychiatric settings while ensuring clients received the necessary levels of care. The report identified several groups that required further concentrated support moving forward, among them “the chronically mentally ill,” which, based on the descriptions of this population, meant persons with SPMI. The Graham Report made a number of recommendations, including that mental health care should be individualized (i.e., tailored to the needs of the client with his or her input) and delivered in a community environment that makes use of a client’s pre-existing social and familial relationships, when possible, while recognizing the multi-dimensional nature of mental illnesses (Graham Report 1988). A 1993 report echoed the conclusion and goals of the Graham Report regarding persons with SPMI, but further emphasized that SPMI affects individuals from all races, ages, cultures, and genders; therefore, services for persons with SPMI should be sensitive to their diverse experiences (Ontario Ministry of Health 1993).

As Strike and colleagues argue, “many risk and protective factors for mental health lie outside the domain of the mental and physical health systems” (2002, 81). In this vein, two documents in 1993 further cemented Ontario’s decision to move toward comprehensive community mental health services. The first document, Making it Happen: Implementation Plan, articulated the different characteristics that a reformed
mental health system would have, including a continuum of services (e.g., treatment, rehabilitation, and long-term support) for a variety of levels of needs; streamlined access whereby services would be sensitive to different people's cultures with delivery in a timely manner and with as little bureaucracy as possible; integration of the mental health system with a variety of services that persons with mental illness would want and need beyond mere clinical services (e.g., vocational assistance, recreation, family supports, etc); and an accountability framework to guide evaluation and future management (Ontario Ministry of Health 1999). The second document, Making it Happen: Operational Framework, outlined what supports and services should be used to bring to fruition the goals articulated in the implementation document, including first-line services (i.e., emergency programs) and intensive and specialized services (e.g., ACT or ICM).

In 2003, Ontario released its Mental Health Accountability Framework, which outlined eight domains of accountability and numerous measures for each domain. In particular, the report articulated the need for acceptability (i.e., services meet the expectations of “service users, community, providers, and government”), accessibility (i.e., clients can obtain relevant services in a timely fashion), and appropriateness (i.e., services are relevant to clients’ needs) (Ontario Ministry of Health and Long-Term Care 2003). These domains of accountability are in keeping with previous documents on the mental health system in Ontario. However, another domain, that of efficiency (which states that the organizations and programs must be as cost-effective as possible), coupled with notion that the acceptability of services must include acceptability to government, represents the first time that financial issues and actors external to that of clients, client families, and providers, became central in discussions of the mental health system (ibid.). The emphasis on financial efficiency and accountability to government has some merits (e.g., as important as the mental health system is, it is one social service the province provides among many others), but could potentially become a challenge or conflict if the programs that are considered the best standard of care are more expensive than alternative services that are comparatively less effective. This new emphasis, even if it remains secondary to the articulated needs of clients, should be paid attention to — not as a positive or negative feature of the Ontario government's conceptualization of mental healthcare, but as something to track in future government documents on the mental health system to see whether it continues to play a role in notions of accountability and what effect, if any, it may have on supports and services, especially in times of economic uncertainty.

Two more reports concluded that, although the mental health system in Ontario has many areas of success, there remains room for growth. Koegl and colleagues (2004) considered that the province was doing a satisfactory job providing community-care for persons requiring intermittent or weekly care and was also providing adequate levels of support for persons requiring residential treatment and in-patient care. Where the provincial mental health system could improve was with programs aimed at persons with SPMI who require community care on a daily basis, e.g., ACT or ICM, so as to prevent the need for future residential or in-patient care. The Community Mental Health Evaluation Initiative reached similar conclusions: namely, that intensive community services, like ACT, were proving beneficial, but that moving forward, the province needed to give more attention to the social aspects of the lives of persons with SPMI, including greater housing and employment support, as well as trying to integrate and support family members when possible and helping clients integrate better into their communities so as to reduce isolation (Community Mental Health Evaluation Initiative and Government of Ontario 2004).

**Tuberculosis and Persons with SPMI**

**Epidemiology**

To reiterate, in 2008, there were 11.1 million prevalent cases of active TB or 164 cases per 100,000 persons, which is equivalent to 0.002% of the world's population (World Health Organization 2009). Despite the fact that few studies exist regarding the possibility of an increased risk of TB infection in persons who have mental illness, there is piecemeal evidence that the rate of active TB in persons with SPMI is higher than in the general population (Prince et al. 2007). In one chart review study of a hospital's in-patient psychiatric unit in California, the author found that eight patients of a total of 43 (19%) in a two-month period had TB (Lopez 1994). In New York, a two-year case study of infectious diseases in a men's homeless shelter found
that of 85 persons who suffered from mental illnesses and agreed to TB testing, 32 suffered from TB (36.7%) (Saez et al. 1996). Between 1960 and 1978, 82 of 3,251 persons (2.5%) with schizophrenia had TB in Nagasaki, Japan, which was higher than the expected rate TB (27 persons) given the annual incidence rate of TB in that city's general population relative to the number of persons with schizophrenia (Ohta et al. 1988). For the three studies above, the authors do not distinguish between latent and active TB; in the California and New York studies, given the large percentage of persons infected with TB, one might assume that the cases counted include latent TB. In the Japan study, the 2.5% rate of TB could be interpreted as active TB given its proximity to the global rate of incident case of active TB globally (though the Japan study concluded many years before the recent global resurgence of TB). Still, since the authors are not explicit about the kind of TB being measured, there is no way of verifying which rates are of active or latent cases.

Two additional studies from the United States are worth mentioning since they are more explicit about the type of TB reported. One study in 1993 from New York tested for TB in clients from the psychiatric day treatment program of a teaching hospital and found that among 71 clients, 12 tested positive for latent TB only (17%) (McQuistion et al. 1997) when the incidence rate for latent TB in the United State in 1993 was 7.3% (Centers for Disease Control and Prevention 2007). Another study, from a psychiatric hospital in Boston in 1997, found that 108 of 535 clients (20.2%) screened positive on tuberculin skin tests, which includes latent and active TB, when an estimated 5% of the general public screened positive for latent and active TB in the United States during this same time period (Pirl et al. 2005). These two studies demonstrate significant differences between persons with mental illness and their respective general populations with regards to rates of TB.

With the exception of the chart review in the California study, these studies found the differences in the rates of latent and active TB between persons with mental illness and the general population to be statistically significant (Saez et al. 1996; Ohta et al. 1988; McQuistion et al. 1997; Pirl et al. 2005). Of these four studies, two included small sample sizes that may limit the generalizability of their results (Saez et al. 1996; Pirl et al. 2005). Only the project from Japan explicitly studied a population that can be classified as suffering from SPMI (i.e., persons with schizophrenia). The locations of the studies is significant: the higher rates of TB in persons with mental illnesses are occurring in countries with generally the highest standards of infectious disease prevention and care, and therefore generally lower rates of TB than other places in the world.

Several factors have been posited as possible causes of, or catalyst towards, the higher rates of TB in persons with mental illnesses. Ohta and colleagues argue that “poor dietary and sanitary conditions” lead to greater physical illnesses and compromised immunities, making persons with mental illnesses susceptible to TB infection and disease” (Ohta et al. 1988, 45). Moreover, since persons with mental illnesses, especially those with SPMI, tend to be of lower SES, have difficulties with social functioning, often have difficulty caring for themselves (including proper nutrition and hygiene), are often precariously housed leading to time spent in crowded shelters, and often undergo periods of psychiatric institutionalization (Strike, Goering, and Wasylenki 2002), their lifestyles make them particularly susceptible to TB infection (Prince et al. 2007; Gostin 1993). From an ethical and political viewpoint, the case of TB in persons with SPMI is interesting and distressing because it raises an issue about the just distribution of the burden of disease with practical complications (namely, a challenge to any simple application of the harm principle) that contest governments and societies’ commonsense notions of how to properly address highly communicable infectious disease like TB (e.g., through practices such as isolation and DOT).

**Treating TB in Persons with SPMI**

Although drug treatment for TB is the same or similar for persons with SPMI and the general population, three unique challenges of treatment non-adherence within the SPMI population may arise. The primary challenge is that the very presence of a mental illness (in particular the symptoms of delusion and paranoia associated with severe illnesses such as schizophrenia and bipolar disorder, which are often coupled with depression and anxiety) makes adhering to any treatment (whether TB or psychiatric) difficult (Lau and Ferson 1997; Gostin 1993; American Psychiatric Association 2000; Stein and Santos 1998). The negative effects of mental illnesses on adherence are amplified when coupled with poor socioeconomic conditions.
In a surveillance study of TB in the homeless population of suburban Sydney, Australia, approximately 50% of participants with abnormal chest x-rays for TB did not appear for follow-up tests; the authors concluded that one possible reason was the high prevalence of mental illness in homeless populations (Lau and Ferson 1997).

A particularly pertinent study from California used public health records from 11 counties with high rates of TB in 1994 and 1995 to (a) describe the types of patients civilly detained due to persistent non-adherence to TB treatment, (b) measure how many finished TB treatment while in detention, and then (c) compare them to a control group. Although there are important questions regarding study design as reported in the journal (e.g., no record of how many subjects were in the control group, and the authors did not use the same inclusion and exclusion criteria to measure the completion of therapy between study groups), which leads to questions regarding the validity of the comparisons, the authors’ descriptions of those who were detained by public health units remain enlightening. Public health officials detained 67 persistently non-adherent patients; only 66% of those detained completed TB therapy. Twenty-eight percent had mental illnesses, and 81% suffered from some type of psychosocial issue. Those detained were only inconsistently offered standard incentives or enablers for treatment completion; for example, only eight of 19 documented persons with mental illnesses (42%) were referred to mental health services (although it is unclear if the remainder were already receiving psychosocial treatment) and only 16 of 26 of persons who were homeless (62%) were offered any type of housing support. Oscherwitz and colleagues conclude that enhancing the care of persistently non-adherent TB patients requires that public health officials have “the resources… to make reasonable attempts to provide housing, psychiatric care, and substance abuse treatment before detaining such patients,” i.e. before curtailing patients' liberties through detention (1997, 845). Gostin and other researchers reach similar conclusions, namely that addressing the problem of noncompliance of TB treatment is difficult “because the individual's behavior is determined by complex social and personal factors” especially if he or she is homeless, has comorbidities, lacks a supportive social network, and suffers from a mental illness. Addressing these issues is paramount to enhancing compliance to TB treatment in the SPMI population (Gostin 1993, 60; Franke et al. 2008).

Although perhaps somewhat dated, ethnographic studies from the late 1960s postulate that a second difficulty in treating persons with SPMI for TB might stem from the different theoretical perspectives of public health and psychiatry. First, there is general consensus as to the etiology and necessary course of treatment for TB, but much less so for the myriad and range of mental illnesses (Fagerhaugh 1968; Fagerhaugh 1970). Second, TB treatment is "concrete, routinized and relatively predictable" whereas in mental health, care is less predictable and there is less consensus amongst practitioners (Fagerhaugh 1968, 86). Finally, in TB treatment, maintaining the healthcare worker-patient relationship is of secondary importance relative to ensuring the protection of the public by limiting transmissibility, whereas the trust between the healthcare worker and client is of utmost importance for successful mental health care (Fagerhaugh 1968; Fagerhaugh 1970). What I take from Fagerhaugh’s ethnographic studies is that the goals of public health (i.e., protection of the public) often conflict with those of mental health (i.e., primarily the clinical improvement and empowerment of individuals), which leads to difficulties in treating persons with TB and SPMI.

A third difficulty in maintaining TB treatment fidelity in persons with SPMI has to do with the adverse effects of TB medication. Psychosis is a rare adverse event associated to isoniazid, a commonly prescribed first-line TB drug; cycloserine, a drug often given in conjunction with other second-line medication in the treatment of MDR-TB, is contraindicated in persons with a history of depression, anxiety, or psychosis (although it is unclear whether this entails absolute contraindication) (World Health Organization 2006). As such, the issue regarding psychosis as a possible adverse event is more important when treating M/XDR-TB. In a chart review study in Latvia, 133 of 1,021 of patients (13%) suffered psychiatric episodes as a result of adverse effects from MDR-TB medication (Bloss et al. 2010). Another multi-site (and multi-country) chart review study found 28 cases of psychosis in 818 MDR-TB patients (3.4%) where adverse drug reactions were the suspected cause (Nathanson et al. 2004). The challenge in evaluating these two studies is that the
authors do not state whether there was any baseline psychiatric diagnosis that can then help distinguish between psychiatric symptoms due to adverse drug reactions from pre-existing conditions. In a chart review study from Turkey, Torun and colleagues (2005) found that of a total of 263 MDR-TB patient with no psychiatric comorbidities who received varying amounts of cycloserine, psychiatric symptoms, including psychosis, were present in 56 cases (21.3%). Torun and colleagues state that the symptoms of 32 patients were successfully managed with additional medication (e.g., antidepressant) or by tapering their TB medication, but that the 24 patients whose symptoms could not be managed were removed from cycloserine “in a mean time of 7 months” (ibid., 1375). Although it is unclear whether the mean is the proper measure for removal of patients from cycloserine (i.e., whether mode or median would give a better understanding of the context given the small sample size), one could argue that seven months in a course of treatment for MDR-TB that lasts approximately 24 months is a significant amount of time to be suffering from psychiatric symptoms before removing the suspected drug.

One retrospective chart review study from Peru merits special attention. Vega and colleagues (2004) found that from 1996 to 1999, 75 patients were treated for MDR-TB in Lima, and all but one were taking cycloserine as part of treatment. Forty-two patients suffered from depression or anxiety prior to MDR-TB treatment; none suffered from baseline psychosis. Nine patients (12%) developed psychotic symptoms because of MDR-TB treatment and the authors presumed that it was because of the cycloserine. The only risk factor identified that was statistically significant was younger age (i.e., persons between the ages of 24 and 30). Of the nine patients with psychosis, seven patients received either reduced doses or temporary suspension of cycloserine; eight received anti-psychotic medication. Three patients required anti-psychotic medication throughout the duration of their treatment, and one patient required continuation of anti-psychotic medication beyond 45 days after the cessation of MDR-TB treatment. The median duration of psychosis was four weeks. Two of the nine patients defaulted from treatment. Vega and colleagues recommend that managing psychiatric complications because of MDR-TB treatment requires prompt identification on the part of healthcare workers, use of psychiatric medications, and access to psychosocial support groups. The authors conclude that adverse psychiatric effects can be successfully managed.

Despite the hope this study provides about the possibility of managing the psychiatric adverse effects of TB medication, several important limitations should be noted. First, as Vega and colleagues (2004) suggest, a larger sample size is needed in order to make findings generalizable, particularly in the context of psychosis as opposed to depression and anxiety. Second, since none of the patients in the study had baseline psychosis, the extent of the adverse effects of cycloserine and other anti-tubercular drugs in persons with pre-existing psychotic conditions remains unclear. Third, this study does not describe the adverse effects of the anti-psychotic medications themselves, which is particularly pertinent in the cases of the three patients who had to take anti-psychotic medication throughout the duration of MDR-TB treatment. Currently, there appear to be no studies regarding the adverse effects of anti-tubercular drugs, in particular isoniazid or cycloserine, in patients with baseline psychosis.

The very presence of mental illnesses in persons with SPMI, the potentially varying goals of public health and mental health, and the adverse psychiatric effects of anti-tubercular drugs all combine to create challenges in TB treatment adherence in persons with mental illness including SPMI. Maintaining drug adherence is important to arresting the spread of TB and minimizing the resurgence of TB and the transmission of M/XDR-TB. To reiterate, the Public Health Agency of Canada recommends automatic DOTS for anyone belonging to a high-risk group for non-adherence to TB treatment (e.g., persons with mental illnesses) (Public Health Agency of Canada 2007); persistent non-adherence in most jurisdictions means that involuntary detention can be imposed (Osherwitz, Tulsky, and Roger 1997). Although many in public health acknowledge that negative psychosocial factors, including a lack of sustainable housing and basic life provisions, increase the probability of non-adherence to TB treatment in persons with mental illnesses and SPMI, addressing such underlying issues becomes secondary in light of an infectious disease with the possibility for high levels of morbidity. As a result, varying degrees of liberty are curtailed, either voluntarily or involuntarily, for the protection of the general public.
CONCLUSION

One can begin to see a conflict between the philosophies of public health and mental health and how that might affect the treatment of TB in persons with SPMI. First, the WHO’s recommendation of automatic DOT for all persons with SPMI removes the responsibility (and corresponding liberty) of drug management from the client. The reason for such measures is due to the perception that persons with SPMI will likely not adhere to anti-tubercular drug regimens. Such measures are taken with this population regardless of whether the individual patient has a history of general medication adherence or not (i.e., by virtue of merely being a member of this population). Although this may be a necessary step to protect the public from infection, it may still function as a curtailment of the liberty of a person with SPMI. Second, those persons with SPMI who must undergo treatment for TB are subject to restrictions on liberty in a manner that not only affects their freedom of movement but may also, in fact, run counter to their mental health treatment and care. For example, although being in respiratory isolation and adhering to anti-tubercular drug regimens may be difficult for anyone, TB treatment may negatively impact the care of persons with SPMI by removing them from support networks and limiting their integration into the community. The underlying foundation for public health’s interventions is protecting the public from harm, but the question remains, To what extent is this viewpoint justified when applied to certain populations that may be disadvantaged by the very public health measures that are instituted.

Moreover, mental health has a recent history of advocacy for the rights and liberties of persons with mental illness, including the right to refuse treatment. This liberty can be legally curtailed in light of imminent harm to self or others; yet this is grounded on the basis of a psychiatric illnesses being the ultimate cause of potential harm to others. In the case of limiting liberties of persons with SPMI to treat TB, there is an introduction of a unique source of harm that is indirect and external to the person’s mental state, namely the TB, raising yet another question. Is there a material difference in the perception of liberty restrictions for persons with SPMI depending on the cause of the restriction, i.e., potential harms from psychotic episodes as opposed to potential harms from TB exposure?
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