

August 2011



## Analysis in Brief

# Restraint Use and Other Control Interventions for Mental Health Inpatients in Ontario

## Executive Summary

Guided by least-restraint policies, the use of control interventions is intended to be a method of last resort for preventing self-harm or harm to others. When control interventions are used, they can have detrimental effects for both clients and hospital staff.

This analysis provides a profile of adults hospitalized for mental illness who, during their hospital stay, experienced the use of at least one of three types of control interventions: acute control medication; mechanical or physical restraint; and seclusion.

Using data from CIHI's Ontario Mental Health Reporting System (OMHRS) from 2006–2007 to 2009–2010, the relationships among several factors and the use of control interventions were explored. The factors included a wide range of information available in the OMHRS data, such as socio-demographic characteristics, exhibited behaviours, cognitive or communication abilities, life stressors and types of services.

Overall, close to one in four (24%) of all individuals admitted to a designated mental health bed in Ontario experienced at least one type of control intervention during their hospitalization.

When compared with hospitalized individuals who did not experience any of the control interventions

- Those who were psychiatric inpatients at general hospitals were 76% more likely to have experienced any control intervention, compared with those at psychiatric hospitals. They were also 161% (or more than two and a half times) more likely to have experienced physical or mechanical restraint.

## Types of Care

### Who We Are

Established in 1994, CIHI is an independent, not-for-profit corporation that provides essential information on Canada's health system and the health of Canadians. Funded by federal, provincial and territorial governments, we are guided by a Board of Directors made up of health leaders across the country.

### Our Vision

To help improve Canada's health system and the well-being of Canadians by being a leading source of unbiased, credible and comparable information that will enable health leaders to make better-informed decisions.

### Federal Identity Program

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- Those individuals who had the greatest difficulty communicating were more than twice as likely to have experienced any control intervention.
- Those who experienced any control intervention were 98% more likely to have engaged in recent violent behaviour and between 53% and 72% more likely to have exhibited other threatening behaviours.
- Individuals who had a history of physical, emotional or sexual abuse were 16% less likely to have experienced physical/mechanical restraint as those with no such history.
- Those who had a history of six or more psychiatric hospitalizations were more than twice as likely to have experienced a control intervention as those individuals who were hospitalized for the first time.

The analysis identifies an interrelated set of factors that distinguishes individuals who experience control interventions from those who do not. The most obvious among these relate to the tendency toward aggressive and disruptive behaviours. These behaviours, in turn, may be linked to a number of underlying clinical, treatment and cognitive/communication factors, among others.

When compared with other jurisdictions where the use of control interventions in inpatient mental health settings has been virtually eliminated, the overall rate of control intervention use in Ontario suggests that there is room for reduction.<sup>1</sup> The analysis identified areas where actionable differences can facilitate such a reduction. The higher rates of control intervention use in general hospitals, compared with those in psychiatric hospitals, and in those who have significant communication difficulties indicate two areas where the adoption of evolving clinical practices can have an impact in avoiding and reducing the use of control interventions.

## Introduction

Control interventions, such as acute control medication, mechanical or physical restraints and seclusion, are generally used with the intention of protecting individuals from self-harm or preventing harm to another person. However, the use of control interventions has also been associated with a number of potentially adverse outcomes, such as further provocation of aggression, injury to staff or patients, recollections of past abuse and damage to therapeutic alliances between patients and staff.<sup>2, 3</sup> In settings where practices to minimize control interventions have been implemented, some research has shown that as more resources and staff time are committed to activities other than control interventions better outcomes for patients and staff are observed.<sup>4</sup>

There have been a number of efforts to develop best practices and guidelines for the use of control interventions,<sup>5-7</sup> as well as a number of initiatives that emphasize least restraint. These initiatives are influenced, in part, by multiple pieces of legislation; in Ontario, legislation includes the *Patient Restraint Minimization Act*,<sup>8</sup> the *Mental Health Act*<sup>9</sup> and the *Health Care Consent Act*.<sup>10</sup> A 2008 coroner's inquest<sup>11</sup> recommended that facilities aspire to provide restraint-free care and that they ensure greater involvement of patients and their advocates in managing risks that would ultimately lead to restraints being implemented.

Although use of control interventions has been considered an indicator of the quality of psychiatric care,<sup>12</sup> variations in the way the interventions are defined, legislated and reported, both internationally and across jurisdictions, make comparative assessments of control intervention use challenging. For example, wide variation in usage was demonstrated in a recent review of seclusion and restraint use in 12 developed countries, where reported rates ranged from 580 to less than 20 per 100,000 inhabitants.<sup>13</sup> Moreover, there has been an interest in researching possible declines in the rates of control interventions since changes in regulations and clinical practices aimed at minimizing their use have been implemented.<sup>1, 14, 15</sup>

Recent figures on rates of control interventions for inpatient mental health settings in Canada are sparse. However, some information is available on rates in other settings. A 2009 report found that rates of physical restraint in Ontario nursing homes (31.4%, on average) were higher than rates in Finland, Hong Kong, Switzerland and the United States.<sup>16</sup> Also, a report released by CIHI stated that the proportion of assessed residents in complex continuing care settings documented as being exposed to most types of daily restraint<sup>i</sup> over a seven-day period decreased between 1996–1997 and 2002–2003.<sup>17</sup>

Previously published research to distinguish the characteristics of hospitalized psychiatric patients who experience control interventions from those who do not has focused on socio-demographic, clinical, treatment and facility characteristics.<sup>18, 19</sup> Some factors consistently associated with the use of control interventions are being male;<sup>20, 21</sup> exhibiting aggressive,<sup>22</sup> disruptive or self-injurious behaviours;<sup>23</sup> experiencing cognitive impairments typically associated with dementia;<sup>23, 24</sup> and having a diagnosis of schizophrenia or psychosis.<sup>21, 25</sup> Additionally, research on the role of health care staff in decisions to implement control interventions has identified factors related to competencies or training<sup>26</sup> and, generally, a perceived need to exercise control over behaviours that are potentially harmful to the patient or others.<sup>27</sup>

## Purpose

The purpose of this analysis is to profile the characteristics of those individuals who experienced any of the three types of control interventions during their stay in a designated mental health bed in Ontario. The characteristics of these individuals as a collective group are compared with those of individuals who did not experience any such control intervention. Also, the analysis examines differences between the three types of control interventions as grouped for this report.

Data used in the analysis is from OMHRS and is based on the Resident Assessment Instrument for Mental Health (RAI-MH<sup>®</sup>). The various types of control interventions are defined in the RAI-MH<sup>28</sup> as follows:

- **Acute control medication:** Psychotropic medication is administered as an immediate response to control agitation or threatening, destructive or assaultive behaviours in order to prevent harm to self or others.
- **Mechanical restraint:** A person is placed in mechanical restraints and is unable to ambulate (for example, restrained in bed), or the person is placed in mechanical restraints but is able to ambulate (for example, wrist restraints only).
- **Physical restraint:** A person is physically held to restrict his or her movement for a brief period of time, in order to restore calm to the individual. This does not refer to holding a person in order to apply a mechanical restraint.
- **Seclusion:** A person is placed in a room that confines him or her and from which he or she cannot exit freely.

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i. The Continuing Care Reporting System (CCRS) at CIHI defines restraint use as the use of any device (for example, a physical or mechanical device, material or equipment attached or adjacent to the resident's body) that the resident cannot easily remove and that restricts freedom of movement or normal access to his or her body.

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## CIHI's Ontario Mental Health Reporting System

OMHRS was established by the Canadian Institute for Health Information (CIHI) in 2005 through a partnership with the Ontario Ministry of Health and Long-Term Care to enable standardized data collection and reporting for adult inpatient mental health services in Ontario. During 2010–2011, 68 hospitals in Ontario participated in OMHRS, representing activity for more than 4,600 designated beds. Of the 68 hospitals, 13 are specialty psychiatric hospitals, which predominantly provide mental health services, and 55 are general hospitals with adult mental health beds, which provide services for a wide variety of health conditions in addition to mental health.

The data submitted to CIHI for the purposes of OMHRS is collected by hospital staff using a standardized clinical assessment instrument known as the RAI-MH. The RAI-MH includes care planning, outcome measurement, quality improvement and case-mix applications. The information collected through the RAI-MH is designed to inform decision-making by health care professionals and hospital administrators, as well as system planners and policy-makers at regional and provincial levels.

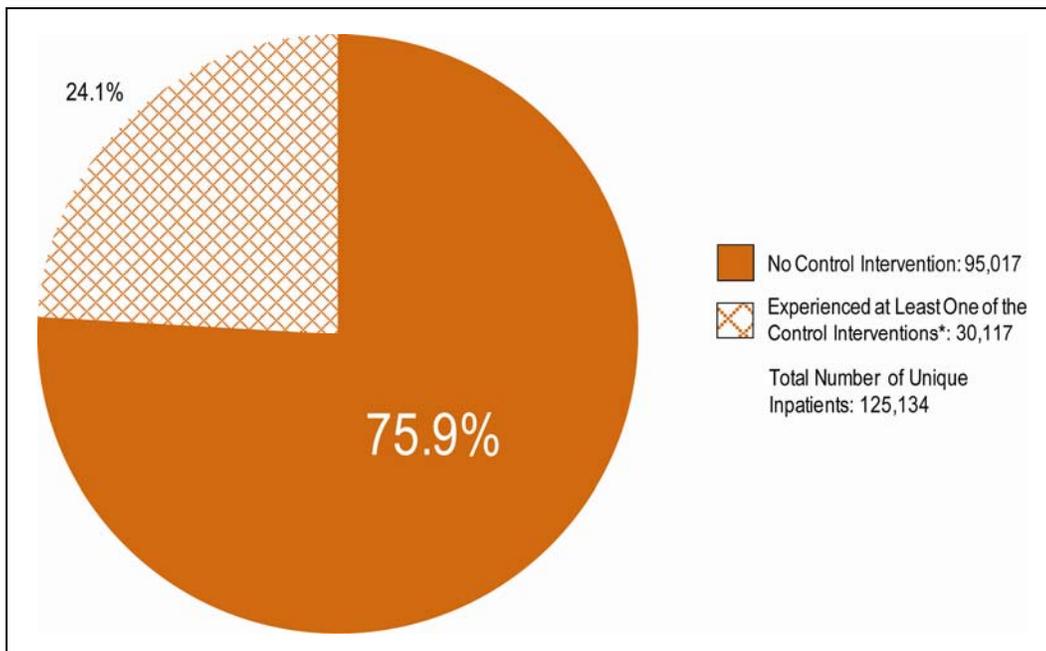
For more information about OMHRS, visit [www.cihi.ca/omhrs](http://www.cihi.ca/omhrs) or send an email to [omhrs@cihi.ca](mailto:omhrs@cihi.ca).

## Findings

### Proportion of Inpatients Who Experienced Control Interventions

Of the individuals hospitalized in Ontario for a mental illness between 2006–2007 and 2009–2010, 24.1% experienced at least one control intervention: acute control medication, physical restraint, mechanical restraint or seclusion (Figure 1).

Figure 1: Proportion of Inpatients Who Experienced at Least One Control Intervention Between 2006–2007 and 2009–2010



#### Note

\* Types of control intervention are acute control medication, physical restraint, mechanical restraint and seclusion.

#### Source

Ontario Mental Health Reporting System, Canadian Institute for Health Information.

## Characteristics of Psychiatric Inpatients Who Experienced Control Interventions

A subset of the total number of unique inpatients who experienced a control intervention between 2006–2007 and 2009–2010 was selected for the analysis. In total, more than 92,000 individuals with complete assessments (see Appendix A) were included in the analyses, with close to three-quarters in the non-intervention group and the remainder in one of three control intervention groups. Between 2006–2007 and 2009–2010, among individuals who experienced control interventions, acute control medications (58.9%) were used most often, followed by the use of physical/mechanical restraint (20.7%) and seclusion (20.4%). Individuals in the three control intervention groups were similar in terms of a number of characteristics, such as age and neighbourhood income quintile, but they differed markedly in terms of a number of others, such as having committed recent violence against others.

More than half of the individuals who experienced any type of control intervention were male, and the average age was the early forties. About one-third of these individuals had more than a high school education, 16.9% were employed and the largest single proportion (about one-third) was in the lowest income quintile.

Regarding the behavioural factors of those individuals who experienced control interventions, more than half were hospitalized because they posed a threat or danger to themselves, and about a third were hospitalized because they posed a threat or danger to others. Many of these individuals had acted violently toward others (29.4%) or had police interventions (37.4%), and more than half of them had been incapable of caring for themselves. Almost a third of these individuals had a history of emotional, physical or sexual abuse, and a small proportion exhibited difficulties with communication and with cognitive function.

In terms of treatment, the median hospital stay for individuals who experienced control interventions was just more than two weeks, more than 70% had a history of past psychiatric hospitalizations, more than 40% demonstrated a significant lack of adherence with prescribed medication and more than 80% were treated in a general hospital rather than a specialty psychiatric hospital.

With respect to the most frequently occurring mental illness diagnosis recorded, among those who experienced a control intervention, the largest group of individuals (41.5%) had been diagnosed with schizophrenia and psychotic disorders. Less than 20% had a concurrent substance use diagnosis or a concurrent personality disorder diagnosis. A summary of the characteristics of individuals in the control intervention groups and the non-intervention group is available in Table B1.

## What Are the Factors Associated With Experiencing a Control Intervention?

A total of 19 potential predictors were included in this analysis; they were categorized into six domains: socio-demographic, behavioural, cognitive/communication, life stressor, treatment and clinical (Table 1).

**Table 1: Conceptual Framework**

Socio-Demographic	Behavioural	Cognitive/Communication	Life Stressor	Treatment	Clinical
Gender	Threat/Danger to Self	Capacity to Consent to Treatment	Abused/Assaulted Emotionally, Physically, Sexually	Length of Stay	Primary Mental Health Diagnosis
Age	Threat/Danger to Others	Making Self Understood		Number of Lifetime Psychiatric Hospitalizations	Concurrent Substance Abuse/Addiction
Education	Inability to Care for Self Due to Mental Illness			Medication Adherence	Concurrent Personality Disorder
Employment Status	Police Intervention for Violent or Non-Violent Behaviour			Type of Facility	
Neighbourhood Income Quintile	Violence Toward Others				

### Source

Ontario Mental Health Reporting System, Canadian Institute for Health Information.

A number of factors across the six domains distinguished psychiatric inpatients who experienced control interventions from those who did not. In large part, these findings are consistent with those from previously published research, and they tell a story of individuals who, even compared with other individuals who were hospitalized for severe mental illness (but who did not experience a control intervention), had distinctly more difficulty in a number of domains. Considered collectively, those who experienced some form of control intervention had greater behavioural, cognitive, communication and treatment adherence difficulties, and they had a longer history of psychiatric hospitalization than individuals who did not have control interventions. Analysis of these findings suggests that the factors influencing control interventions are mainly interrelated, with the most obvious influence being that of aggressive or disruptive behaviours, and more subtle or underlying factors being the interrelations between treatment failure, severity of clinical symptoms and difficulties in cognition, communication and self-care. The factors and their interrelations were analyzed, by domain, using a multivariable logistic regression model. More detailed results of the statistical analysis are available in Table B2.

## Socio-Demographic Factors

Among the socio-demographic factors that were examined, age and employment status appeared to have a consistent impact across the different control interventions. The likelihood of experiencing a control intervention decreased with age, such that the oldest individuals were 46% less likely than the youngest individuals to experience one of the three control interventions. Individuals who were not employed were about 22% more likely to experience control interventions than those who were employed. Although published research has found that males experience more control interventions than females,<sup>29</sup> the results of the current analysis found this to be the case only among individuals who were secluded; in other words, men were more likely to experience seclusion than women. The fact that individuals in the oldest age group were significantly less likely than those in the youngest age group to experience control interventions may be a reflection of the type of interventions examined here. These are aimed at preventing aggressive or disruptive behaviours rather than, for example, preventing injuries due to falls, as in the use of chairs that prevent rising, which are more commonly used with an elderly population.

## Behavioural Factors

When threatening or dangerous behaviours were the reason for admission to hospital, individuals were more likely to experience control interventions. Those admitted to hospital because they were deemed to have been a threat or danger to themselves were more than 50% more likely to have experienced a control intervention, and those who were admitted because they were deemed to have been a threat or danger to others were more than 70% more likely to have experienced a control intervention, compared with those who were not admitted for such reasons. Similarly, control interventions were more likely to be used for those who had experienced police interventions prior to hospitalization, especially if the police interventions were recent (50.7%), compared with those who had never experienced police interventions. The impact was most pronounced for those individuals who had demonstrated more recent violence toward others. They were almost twice as likely to have experienced a control intervention as those who had never been violent toward others.

Given the threatening and violent behaviours surrounding the hospitalization of many individuals who experienced control interventions, it is possible that these behaviours carried over into the hospital setting. These findings highlight the relationship between disruptive or aggressive behaviours and control intervention use, in that the behaviours represent a manifest danger to the safety of patients and staff. If such behaviours are not subdued in an alternate manner, such as through verbal dissuasion, they can have an immediate effect on the clinical decision to use control interventions.<sup>22, 30</sup>

In addition to aggressive behaviour, the analysis suggests difficulties managing fundamental tasks related to self-care and the resulting dependence on others. The findings indicate that individuals who were incapable of caring for themselves due to their mental illness were 60.2% more likely to experience control interventions than individuals who did not have these difficulties. The inability to care for oneself can indicate that the symptoms of a mental illness are of debilitating severity and impinge on a number of abilities, including cognition and communication.

## **Cognitive/Communication Factors**

Individuals who were incapable of consenting to treatment were 39.3% more likely, and those who had difficulties making themselves understood were more than twice as likely, to have experienced control intervention than those who had no such difficulties. As with the inability to care for oneself, these factors may reflect challenges in cognitive function that hinder the ability to communicate or to make decisions, can result in confusion when trying to understand instructions and are often indicative of severe symptoms of a mental illness. As demonstrated elsewhere,<sup>2, 31</sup> difficulties in communication may have limited the effectiveness of more moderate approaches to managing aggressive behaviours. Difficulties in cognitive processing and communication, such as disordered or delusional thoughts, are symptomatic of individuals with schizophrenia and psychotic disorders, dementia and bipolar disorder.

## **Clinical Factors**

Those who were diagnosed with organic disorders, bipolar disorders or schizophrenia and psychotic disorders were 68.7%, 50.3% and 40.2% more likely, respectively, to experience control interventions, compared with those diagnosed with depression. This is consistent with findings from previous research<sup>22</sup> and is in line with findings regarding challenges in cognitive function and communication. Except in the case of acute control medications, having a concurrent substance use or personality disorder was not related to increased control intervention use.

## **Treatment Factors**

Those who reported less than 80% adherence to prescribed medications were almost twice as likely to have experienced a control intervention as those who reported being always adherent. The likelihood of experiencing control interventions appeared to increase with corresponding increases in the number of lifetime hospitalizations that individuals reported. For example, for those with a reported history of six or more psychiatric hospitalizations, the likelihood of experiencing control interventions was more than twice that of those hospitalized for the first time. Both factors suggest that the use of control interventions may be related to preceding issues with mental health treatments. A consistent lack of adherence to prescribed medications may result in a decline in an individual's condition, characterized by the recurrence of severe psychiatric symptoms that necessitates hospitalization or rehospitalization for mental illness.

The findings of this analysis indicate that individuals who received care in a general hospital were 76.3% more likely to have experienced control interventions than those who received care in a psychiatric hospital, regardless of other factors. This may relate, at least in part, to the documented benefits of more specialized clinical practices, as well as the greater experience in dealing with mental health patients and related crisis situations in psychiatric hospitals.<sup>32</sup> It may also reflect the role of general hospitals as a sort of default or front line for many individuals who are experiencing psychiatric instability and exhibiting a propensity toward aggressive behaviour. Since approximately 80% of inpatient mental health services are provided in general hospitals annually, a comparison with psychiatric hospitals of restraint minimization practices and care pathways may be a means of effecting an overall reduction in the use of control interventions.

## Life Stressors

The current analysis suggests an inverse relationship between previous exposure to physical, sexual or emotional abuse and exposure to control interventions. Individuals who had a history of abuse were 8.2% less likely to have been secluded and 15.9% less likely to have experienced physical or mechanical restraints than individuals who had no such histories. It is possible that staff, who may have been aware of the patients' history of abuse, avoided the use of control interventions (physical/mechanical restraints in particular) in an effort to avert the possibility of re-traumatizing patients. Since abuse and other traumas are part of a personal history for many living with mental illness, further investigation into the importance of trauma-informed care in reducing control interventions should be considered.

## Differences Between Control Interventions

On a number of factors, differences were observed between those experiencing acute control medications, physical/mechanical restraints and seclusion. Individuals who were physically or mechanically restrained were the most likely to have been admitted because they had threatened (or posed a danger to) others and were most likely to have exhibited recent violent behaviours toward others, compared with the other control intervention groups and the non-intervention group. Those who were physically or mechanically restrained also had the most difficulty consenting to treatment, making themselves understood and adhering to prescribed medications. The findings suggest that those who had physical and mechanical restraints were unique with respect to the behavioural and other domains included in the analysis, even among those who experienced control interventions. Further investigation of the relationship between predictors and the use of control interventions for these individuals is warranted, particularly in general hospital settings, where the vast majority of such restraints are applied.

## Conclusion

In an era when legislation and clinical practice guidelines aim to minimize and even eliminate control interventions, analytical information describing the conditions surrounding their use can be helpful. The profile of control interventions provided in the current analysis demonstrates the relationship between control intervention use and aggressive behaviours and identifies a number of factors possibly underlying those behaviours. Guidelines for minimizing control interventions and making them an option of last resort emphasize the need to understand difficult behaviours by assessing factors, such as medication non-compliance, that lead up to their use.<sup>5</sup> This can help with pre-emptive measures based on client-centred care planning that aim to manage difficult behaviours by enhancing conditions related to client safety, eliminating triggering factors, reducing agitation and de-escalating crises.

The analysis revealed significant differences between the use of control interventions in general hospitals and psychiatric hospitals. Future analyses might focus on a comparative investigation of clinical practices and pathways of care as they relate to the use of control interventions in general versus psychiatric hospitals, as a means of identifying actionable differences for reducing the use of control interventions. In contexts where reduction initiatives have been effective, there is evidence for organizational changes, including leadership and policy direction, staff training on alternative means of controlling crisis situations and the engagement of patients in the formulation of individualized management strategies.<sup>1, 33</sup>

## Limitations

The rates reported in this analysis likely represent a conservative estimate of the actual figures of control interventions in inpatient psychiatry. This is partly due to the manner of reporting control interventions in OMHRS: routine assessments typically occur at set quarterly intervals and may not capture information about incidents that occur between intervals. This is related to the fact that there is no reporting requirement for control interventions and, therefore, in instances where hospital stays are longer, a larger number of control interventions may have gone unreported.

The analysis was limited by the exclusion of individuals with hospital stays of three days or less. Short-stay RAI-MH assessments do not require all data elements to be coded and thus are generally inadequate for such analytical purposes.

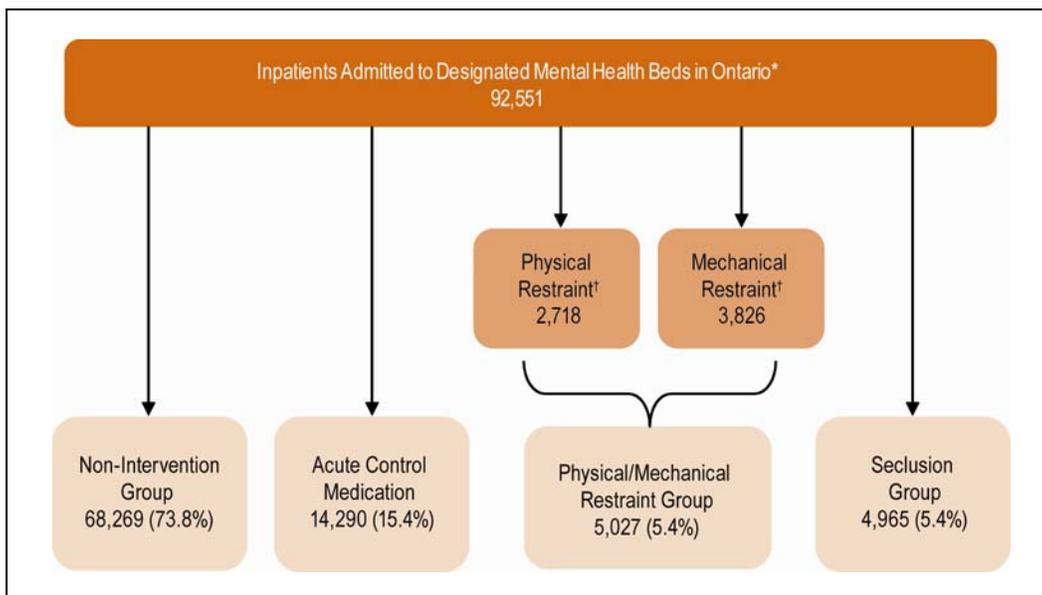
Finally, the analysis would have benefited from more detailed facility- and staff-level information, such as on level of training in the use of control interventions and whether guidelines were in place for a restraint-free environment at specific facilities.

## Appendix A: Methodological Notes

### Data Source and Inclusion Criteria

The cohort for this analysis was assembled from information available in OMHRS. The data used in the analysis is principally based on the RAI-MH instrument in OMHRS. The cohort included adults who were discharged between April 1, 2006, and March 31, 2010, from a designated adult mental health bed in an Ontario hospital. To be included in the analysis, records had to have a valid health card number, a primary mental health diagnosis (DSM-IV), sex as male or female and a full assessment completed for the hospitalization, which meant that the hospital stay had to exceed three days. Therefore, records for individuals who had only a short-stay assessment were excluded from the analysis because of missing data. For individuals with multiple hospitalizations in the four-year period, the first hospitalization in which a control intervention and a full assessment occurred was selected for the analysis.

**Figure A1: Number of Inpatients Who Experienced Control Interventions Between 2006–2007 and 2009–2010, by Group**



#### Notes

\* Excluded inpatients who experienced any combination of physical/mechanical restraint and seclusion for a given hospitalization and those who were hospitalized for three days or less.

† A patient might have experienced both physical and mechanical restraints during a given hospitalization within the four-year time period; therefore, the sum of patients who experienced physical and mechanical restraints does not equal the number in the Physical/Mechanical Restraint Group.

#### Source

Ontario Mental Health Reporting System, Canadian Institute for Health Information.

## Outcome and Predictor Variables

The intervention groups were mutually exclusive, and mechanical and physical restraints were combined into one group. In instances where acute control medications were used in concert with physical restraint, mechanical restraint or seclusion, the individual was classified in the non-acute control medication group. For example, if an individual experienced both acute control medication and physical restraint, he or she would be classified in the physical/mechanical restraint group. Thus the acute control medication group consisted of individuals who experienced acute control medication only. A fourth group, consisting of all three categories of control interventions, was also created. If an individual had any combination of seclusion and mechanical or physical restraint either in the same hospitalization or in different hospitalizations in the four-year period, he or she was excluded from the analysis. The non-intervention group included those individuals for whom none of the four interventions were used during hospital stays for mental illness in the four-year period.

## Potential Predictor Variables

A total of 19 potential predictors were included in the analysis based on a review of the literature, decisions related to data quality and completeness, and analytical parsimony. Variables were classified into six domains based on a framework that considered their unique relationship with control interventions and their conceptual and practical similarity.

## Statistical Analysis

Overall rates of control intervention were calculated as the number of individuals who had an acute control medication, physical/mechanical restraint or seclusion during a completed episode of hospitalization divided by the total number of individuals discharged after hospitalization for a mental illness in the reference time period.

The main analysis was conducted using multivariate logistic regression, with each of the control interventions serving as a dichotomous outcome variable in one of four fully adjusted models. The models assessed the independent impact of the 19 potential predictors on each of the outcomes or control intervention groups by comparing with the non-intervention group. The adjusted odds ratios and 95% confidence intervals are reported for the multivariate models.

## Appendix B: Data Tables

Table B1: Descriptive Statistics, by Type of Control Intervention Group

Domain	Variable/Categories	Acute Control Medication (N = 14,290)	Physical or Mechanical Restraint (N = 5,027)	Seclusion (N = 4,965)	All Intervention Groups (N = 24,282)	No Control Intervention (N = 68,269)
		Percentage	Percentage	Percentage	Percentage	Percentage
Socio-Demographic	<b>Gender</b>					
	Female	49.5	45.2	40.5	46.7	50.5
	Male	50.5	54.8	59.5	53.3	49.5
	<b>Age (at Admission)</b>					
	Mean (SD)	42.6 (16.1)	43.1 (18.2)	40.0 (15.2)	42.2 (16.4)	44.5 (16.3)
	Median	41.0	41.0	39.0	41.0	44.0
	<b>Education</b>					
	<High School	32.8	33.9	36.8	33.8	28.7
	High School Only	32.3	33.2	33.9	32.8	31.9
	High School+	34.9	33.0	29.3	33.4	39.4

Table B1: Descriptive Statistics, by Type of Control Intervention Group (cont'd)

Domain	Variable/Categories	Acute Control Medication (N = 14,290)	Physical or Mechanical Restraint (N = 5,027)	Seclusion (N = 4,965)	All Intervention Groups (N = 24,282)	No Control Intervention (N = 68,269)
		Percentage	Percentage	Percentage	Percentage	Percentage
	<b>Employment Status</b>					
	Employed	18.0	14.6	16.2	16.9	27.9
	Not Employed	63.5	64.5	67.4	64.5	51.8
	Not in Workforce*	18.6	21.0	16.5	18.7	20.3
	<b>Neighbourhood Income Quintile</b>					
	Lowest	32.9	35.1	35.6	33.9	29.4
	2	22.5	22.2	20.0	21.9	20.9
	3	17.2	16.4	17.8	17.2	18.1
	4	15.0	14.5	15.7	15.0	16.7
	Highest	12.5	11.8	10.8	12.0	14.9
<b>Behavioural</b>	<b>Threat/Danger to Self</b>					
	No	43.5	48.5	50.7	46.0	55.3
	Yes	56.5	51.5	49.3	54.0	44.7
	<b>Threat/Danger to Others</b>					
	No	73.6	55.4	61.9	67.4	86.9
	Yes	26.4	44.6	38.1	32.6	13.1
	<b>Inability to Care for Self Due to Mental Illness</b>					
	No	48.6	41.5	49.9	47.4	69.1
	Yes	51.4	58.5	50.1	52.6	30.9
	<b>Police Intervention for Violent or Non-Violent Behaviour</b>					
	Never	65.7	59.2	57.1	62.6	74.8
	8+ Days Ago	21.8	19.0	26.1	22.1	19.3
	≤7 Days Ago	12.5	21.8	16.8	15.3	6.0
	<b>Violence Toward Others</b>					
	Never	75.7	60.2	66.2	70.6	84.4
8+ Days Ago	15.4	15.2	19.3	16.1	12.0	
≤7 Days Ago	8.9	24.5	14.5	13.3	3.7	
<b>Cognitive/ Communication</b>	<b>Capacity to Consent to Treatment</b>					
	Not Capable of Consenting	10.2	18.7	13.2	12.6	5.8
	Capable of Consenting	89.8	81.3	86.8	87.4	94.2
	<b>Making Self Understood</b>					
	Understood	79.4	71.0	79.5	77.7	89.6
Usually/Often Understood	16.8	20.1	14.8	17.1	8.4	
Sometimes/Rarely Understood	3.8	8.9	5.6	5.2	2.0	
<b>Life Stressors</b>	<b>Abused/Assaulted Emotionally, Physically, Sexually</b>					
	No	65.4	73.8	70.4	68.1	63.5
	Yes	34.6	26.2	29.7	31.9	36.6
<b>Treatment</b>	<b>Length of Stay (Days)</b>					
	Mean (SD)	34.8 (141.0)	35.9 (141.0)	49.4 (191.1)	38.0 (152.7)	32.7 (130.8)
	Median	16.0	16.0	18.0	16.0	16.0

**Table B1: Descriptive Statistics, by Type of Control Intervention Group (cont'd)**

Domain	Variable/Categories	Acute Control Medication (N = 14,290)	Physical or Mechanical Restraint (N = 5,027)	Seclusion (N = 4,965)	All Intervention Groups (N = 24,282)	No Control Intervention (N = 68,269)
		Percentage	Percentage	Percentage	Percentage	Percentage
	<b>Number of Lifetime Psychiatric Hospitalizations</b>					
	None	29.0	28.9	26.1	28.4	43.2
	1–3	36.2	35.6	36.3	36.1	35.7
	4–5	14.7	15.3	16.0	15.1	9.9
	6+	20.2	20.3	21.6	20.5	11.2
	<b>Medication Adherence</b>					
	Always Adherent	30.3	20.5	28.3	27.9	48.9
	80%+	24.7	22.2	21.2	23.5	22.5
	<80% and Fail to Buy Meds	37.1	47.8	41.4	40.1	19.3
	No Medications Prescribed	7.9	9.4	9.1	8.5	9.3
	<b>Type of Facility</b>					
	Psychiatric/Specialty	18.1	12.5	23.6	18.1	28.8
	General Hospital	81.9	87.5	76.4	81.9	71.2
Clinical	<b>Primary Mental Health Diagnosis</b>					
	Depression and Other Mood Disorders	25.4	14.2	17.8	21.6	33.9
	Organic Disorders	3.7	8.5	3.4	4.6	3.0
	Substance-Related Disorders	10.2	8.5	9.0	9.6	18.1
	Schizophrenic and Psychotic Disorders	38.7	44.9	46.3	41.5	23.7
	Bipolar Disorders	13.8	18.0	17.4	15.4	10.8
	Anxiety Disorders	2.7	1.2	0.8	2.0	3.7
	Other Disorders	5.5	4.8	5.2	5.3	6.8
	<b>Concurrent Substance Abuse/Addiction</b>					
	No	82.0	85.0	80.8	82.4	81.6
	Yes	18.0	15.0	19.3	17.6	18.4
	<b>Concurrent Personality Disorder</b>					
	No	85.7	89.1	88.2	86.9	88.2
	Yes	14.4	10.9	11.8	13.1	11.8

**Notes**

\* Not in workforce may include pensioner, student, homemaker, etc.

SD: standard deviation.

**Source**

Ontario Mental Health Reporting System, Canadian Institute for Health Information.

**Table B2: Results From Four Logistic Regression Models of Factors Influencing Control Interventions**

Domain	Potential Predictor	Acute Control Medication				Mechanical/Physical Restraint				Seclusion				All Control Interventions					
		Fully Adjusted				Fully Adjusted				Fully Adjusted				Fully Adjusted					
		Odds Ratio*	LCL	UCL	p-Value <sup>†</sup>	Odds Ratio*	LCL	UCL	p-Value <sup>†</sup>	Odds Ratio*	LCL	UCL	p-Value <sup>†</sup>	Odds Ratio*	LCL	UCL	p-Value <sup>†</sup>		
<b>Socio-Demographic</b>	<b>Gender</b>																		
	Female	1.00				1.00				1.00				1.00					
	Male	0.97	0.92	1.01	NS	0.98	0.90	1.07	NS	1.18	1.09	1.28	<0.01	1.01	0.97	1.05	NS		
	<b>Age (Years)</b>																		
	18–24	1.00				1.00				1.00				1.00					
	25–34	0.90	0.83	0.97	<0.01	0.68	0.60	0.77	<0.01	0.70	0.62	0.78	<0.01	0.81	0.76	0.86	<0.01		
	35–44	0.82	0.76	0.89	<0.01	0.63	0.55	0.71	<0.01	0.61	0.54	0.68	<0.01	0.73	0.69	0.78	<0.01		
	45–54	0.75	0.69	0.81	<0.01	0.56	0.49	0.64	<0.01	0.53	0.47	0.60	<0.01	0.66	0.62	0.70	<0.01		
	55–64	0.65	0.59	0.71	<0.01	0.43	0.37	0.51	<0.01	0.47	0.41	0.54	<0.01	0.57	0.53	0.61	<0.01		
	65–74	0.65	0.58	0.73	<0.01	0.45	0.37	0.55	<0.01	0.33	0.27	0.41	<0.01	0.53	0.48	0.59	<0.01		
	75+	0.64	0.56	0.74	<0.01	0.59	0.48	0.74	<0.01	0.22	0.16	0.29	<0.01	0.54	0.48	0.61	<0.01		
	<b>Education</b>																		
	<High School	1.00				1.00				1.00				1.00					
	High School Only	1.05	0.99	1.11	NS	1.09	0.99	1.19	NS	0.98	0.90	1.07	NS	1.04	0.99	1.09	NS		
	High School+	1.08	1.02	1.14	0.01	1.14	1.03	1.25	0.01	0.84	0.77	0.93	<0.01	1.03	0.98	1.08	NS		
	<b>Employment Status</b>																		
	Employed	1.00				1.00				1.00				1.00					
	Not Employed	1.22	1.15	1.30	<0.01	1.13	1.01	1.26	<0.01	1.28	1.15	1.41	<0.01	1.22	1.16	1.28	<0.01		
	Not in Workforce <sup>‡</sup>	1.05	0.98	1.13	NS	1.00	0.88	1.15	NS	1.09	0.96	1.23	NS	1.05	0.99	1.12	NS		
	<b>Neighbourhood Income Quintile</b>																		
	Lowest	1.00				1.00				1.00				1.00					
2	1.10	1.03	1.17	<0.01	0.99	0.89	1.10	NS	0.90	0.81	0.99	0.04	1.04	0.98	1.09	NS			
3	1.02	0.95	1.09	NS	0.96	0.86	1.07	NS	1.00	0.90	1.11	NS	1.00	0.94	1.06	NS			
4	1.01	0.94	1.08	NS	0.97	0.87	1.10	NS	1.04	0.93	1.16	NS	1.01	0.95	1.07	NS			
Highest	0.99	0.92	1.06	NS	0.92	0.81	1.05	NS	0.84	0.74	0.96	<0.01	0.94	0.89	1.01	NS			
<b>Behavioural</b>	<b>Threat/Danger to Self</b>																		
	No	1.00				1.00				1.00				1.00					
	Yes	1.64	1.56	1.71	<0.01	1.33	1.23	1.44	<0.01	1.29	1.20	1.40	<0.01	1.53	1.47	1.59	<0.01		
	<b>Threat/Danger to Others</b>																		
	No	1.00				1.00				1.00				1.00					
Yes	1.48	1.39	1.57	<0.01	2.14	1.95	2.34	<0.01	2.00	1.83	2.19	<0.01	1.72	1.64	1.81	<0.01			

**Table B2: Results From Four Logistic Regression Models of Factors Influencing Control Interventions (cont'd)**

Domain	Potential Predictor	Acute Control Medication				Mechanical/Physical Restraint				Seclusion				All Control Interventions				
		Fully Adjusted				Fully Adjusted				Fully Adjusted				Fully Adjusted				
		Odds Ratio*	LCL	UCL	p-Value†	Odds Ratio*	LCL	UCL	p-Value†	Odds Ratio*	LCL	UCL	p-Value†	Odds Ratio*	LCL	UCL	p-Value†	
<b>Inability to Care for Self Due to Mental Illness</b>																		
	No	1.00				1.00				1.00				1.00				
	Yes	1.65	1.57	1.73	<0.01	1.66	1.53	1.80	<0.01	1.37	1.27	1.49	<0.01	1.60	1.54	1.67	<0.01	
<b>Police Intervention for Violent or Non-Violent Behaviour</b>																		
	Never	1.00				1.00				1.00				1.00				
	8+ Days Ago	1.09	1.02	1.16	0.01	1.00	0.90	1.12	NS	1.12	1.01	1.24	0.03	1.08	1.02	1.14	<0.01	
	≤7 Days Ago	1.35	1.24	1.46	<0.01	1.62	1.45	1.81	<0.01	1.64	1.46	1.83	<0.01	1.51	1.41	1.61	<0.01	
<b>Violence Toward Others</b>																		
	Never	1.00				1.00				1.00				1.00				
	8+ Days Ago	1.11	1.03	1.19	<0.01	1.30	1.16	1.47	<0.01	1.17	1.04	1.30	<0.01	1.16	1.09	1.23	<0.01	
	≤7 Days Ago	1.54	1.40	1.70	<0.01	3.11	2.76	3.49	<0.01	1.99	1.75	2.26	<0.01	1.98	1.84	2.14	<0.01	
<b>Cognitive/ Communication</b>	<b>Capacity to Consent to Treatment</b>																	
		Capable of Consenting	1.00				1.00				1.00				1.00			
		Not Capable of Consenting	1.19	1.09	1.30	<0.01	1.90	1.69	2.14	<0.01	1.38	1.22	1.56	<0.01	1.39	1.30	1.50	<0.01
	<b>Making Self Understood</b>																	
		Understood	1.00				1.00				1.00				1.00			
		Usually/Often Understood	1.71	1.60	1.83	<0.01	1.78	1.60	1.97	<0.01	1.41	1.26	1.57	<0.01	1.68	1.59	1.78	<0.01
		Sometimes/Rarely Understood	1.60	1.39	1.84	<0.01	2.92	2.46	3.48	<0.01	2.36	1.96	2.85	<0.01	2.09	1.87	2.34	<0.01
<b>Life Stressors</b>	<b>Abused/Assaulted Emotionally, Physically, Sexually</b>																	
		No	1.00				1.00				1.00				1.00			
		Yes	1.03	0.98	1.08	NS	0.84	0.77	0.92	<0.01	0.92	0.85	1.00	0.04	0.97	0.93	1.01	NS
<b>Treatment</b>	<b>Number of Lifetime Psychiatric Hospitalizations</b>																	
		0	1.00				1.00				1.00				1.00			
		1–3	1.31	1.24	1.38	<0.01	1.29	1.16	1.42	<0.01	1.42	1.29	1.56	<0.01	1.33	1.26	1.39	<0.01
		4–5	1.69	1.56	1.82	<0.01	1.58	1.38	1.80	<0.01	1.86	1.64	2.10	<0.01	1.71	1.60	1.82	<0.01
		6+	1.98	1.84	2.13	<0.01	2.00	1.76	2.26	<0.01	2.21	1.96	2.49	<0.01	2.03	1.90	2.16	<0.01

**Table B2: Results From Four Logistic Regression Models of Factors Influencing Control Interventions (cont'd)**

Domain	Potential Predictor	Acute Control Medication				Mechanical/Physical Restraint				Seclusion				All Control Interventions				
		Fully Adjusted				Fully Adjusted				Fully Adjusted				Fully Adjusted				
		Odds Ratio*	LCL	UCL	p-Value†	Odds Ratio*	LCL	UCL	p-Value†	Odds Ratio*	LCL	UCL	p-Value†	Odds Ratio*	LCL	UCL	p-Value†	
<b>Medication Adherence</b>																		
	Always Adherent	1.00				1.00				1.00				1.00				
	80%+	1.45	1.37	1.54	<0.01	1.65	1.48	1.84	<0.01	1.25	1.13	1.38	<0.01	1.43	1.36	1.50	<0.01	
	<80% and Fail to Buy Meds	1.86	1.75	1.97	<0.01	2.61	2.36	2.89	<0.01	1.82	1.66	2.00	<0.01	1.95	1.86	2.05	<0.01	
	No Meds Prescribed	1.28	1.17	1.39	<0.01	1.87	1.61	2.17	<0.01	1.40	1.22	1.61	<0.01	1.37	1.27	1.47	<0.01	
<b>Type of Facility</b>																		
	Psychiatric/Specialty	1.00				1.00				1.00				1.00				
	General Hospital	1.68	1.58	1.79	<0.01	2.61	2.32	2.93	<0.01	1.45	1.31	1.59	<0.01	1.76	1.68	1.86	<0.01	
<b>Clinical</b>	<b>Primary Mental Health Diagnosis</b>																	
		Depression/Other Mood Disorders	1.00				1.00				1.00				1.00			
		Organic Disorders	1.42	1.22	1.65	<0.01	2.66	2.13	3.32	<0.01	1.97	1.51	2.57	<0.01	1.69	1.49	1.91	<0.01
		Substance-Related Disorders	0.88	0.81	0.95	<0.01	1.37	1.17	1.60	<0.01	0.87	0.75	1.01	NS	0.91	0.85	0.98	0.01
		Schizophrenic/Other Psychotic Disorders	1.28	1.20	1.37	<0.01	1.82	1.61	2.05	<0.01	1.51	1.35	1.68	<0.01	1.40	1.33	1.48	<0.01
		Bipolar Disorders	1.22	1.14	1.32	<0.01	2.27	1.99	2.59	<0.01	2.09	1.86	2.36	<0.01	1.50	1.41	1.60	<0.01
		Anxiety Disorders	1.10	0.96	1.26	NS	0.93	0.67	1.30	NS	0.43	0.30	0.63	<0.01	0.96	0.85	1.08	NS
		Other Disorders	0.94	0.85	1.04	NS	1.07	0.88	1.30	NS	0.98	0.82	1.17	NS	0.95	0.87	1.04	NS
	<b>Concurrent Substance Abuse/Addiction</b>																	
		No	1.00				1.00				1.00				1.00			
		Yes	1.07	1.01	1.14	0.02	0.96	0.86	1.08	NS	1.02	0.93	1.13	NS	1.04	0.99	1.10	NS
	<b>Concurrent Personality Disorder</b>																	
		No	1.00				1.00				1.00				1.00			
		Yes	1.13	1.06	1.21	<0.01	1.10	0.97	1.24	NS	0.90	0.80	1.01	NS	1.09	1.03	1.16	<0.01

**Notes**

\* 1.00 indicates reference groups.

† p-value associated with the Wald chi-square for the parameter estimate.

‡ Not in workforce may include pensioner, student, homemaker, etc.

LCL: 95% lower confidence limit.

UCL: 95% upper confidence limit.

NS: not statistically significant.

**Source**

Ontario Mental Health Reporting System, Canadian Institute for Health Information.

## References

1. L. Ashcraft and W. Anthony, "Eliminating Seclusion and Restraint in Recovery-Oriented Crisis Services," *Psychiatric Services* 59, 10 (2008): pp. 1198–1202.
2. R. Almvik et al., "Challenging Behaviour in the Elderly—Monitoring Violent Incidents," *International Journal of Geriatric Psychiatry* 21, 4 (2006): pp. 368–374.
3. W. A. Fisher, "Restraint and Seclusion: A Review of the Literature," *American Journal of Psychiatry* 151, 11 (1994): pp. 1584–1591.
4. J. LeBel and R. Goldstein, "The Economic Cost of Using Restraint and the Value Added by Restraint Reduction or Elimination," *Psychiatric Services* 56, 9 (2005): pp. 1109–1114.
5. College of Nurses of Ontario, *Practice Standard: Restraints* (Toronto, Ont.: CNO, 2009).
6. D. Stewart et al., "A Review of Interventions to Reduce Mechanical Restraint and Seclusion Among Adult Psychiatric Inpatients," *Issues in Mental Health Nursing* 31, 6 (2010): pp. 413–424.
7. C. J. Gaskin et al., "Interventions for Reducing the Use of Seclusion in Psychiatric Facilities: Review of the Literature," *British Journal of Psychiatry* 191 (2007): pp. 298–303.
8. Government of Ontario, *Patient Restraint Minimization Act, 2001* (Toronto, Ont.: Government of Ontario, 2001).
9. Government of Ontario, *Mental Health Act* (Toronto, Ont.: Government of Ontario, 2001).
10. Government of Ontario, *Health Care Consent Act, 1996* (Toronto, Ont.: Government of Ontario, 2010).
11. Office of the Chief Coroner of Ontario, *Inquest Into the Death of Jeffrey James: Jury Recommendation* (Toronto, Ont.: Office of the Chief Coroner of Ontario, 2008).
12. Press Ganey Associates, *International Quality Indicator Project: Psychiatric Care Indicators*, accessed from <http://www.internationalqip.com>.
13. T. Steinert et al., "Incidence of Seclusion and Restraint in Psychiatric Hospitals: A Literature Review and Survey of International Trends," *Social Psychiatry & Psychiatric Epidemiology* 45, 9 (2010): pp. 889–897.
14. J. LeBel, "Regulatory Change: A Pathway to Eliminating Seclusion and Restraint or 'Regulatory Scotoma'?", *Psychiatric Services* 59, 2 (2008): pp. 194–196.
15. J. N. Scanlan, "Interventions to Reduce the Use of Seclusion and Restraint in Inpatient Psychiatric Settings: What We Know So Far—A Review of the Literature," *International Journal of Social Psychiatry* 56, 4 (2010): pp. 412–423.
16. Z. Feng et al., "Use of Physical Restraints and Antipsychotic Medications in Nursing Homes: A Cross-National Study," *International Journal of Geriatric Psychiatry* 24, 10 (2009): pp. 1110–1118.
17. Canadian Institute for Health Information, *Resident Demographics and System Characteristics: Complex Continuing Care in Ontario* (Ottawa, Ont.: CIHI, 2004).

18. T. L. Husum et al., "A Cross-Sectional Prospective Study of Seclusion, Restraint and Involuntary Medication in Acute Psychiatric Wards: Patient, Staff and Ward Characteristics," *BMC Health Services Research* 10 (2010): p. 89.
19. N. K. Ray and M. E. Rappaport, "Use of Restraint and Seclusion in Psychiatric Settings in New York State," *Psychiatric Services* 46, 10 (1995): pp. 1032–1037.
20. C. J. Ryan and L. Bowers, "An Analysis of Nurses' Post-Incident Manual Restraint Reports," *Journal of Psychiatric and Mental Health Nursing* 13, 5 (2006): pp. 527–532.
21. D. L. Goldbloom et al., "Weekend Prescribing Practices and Subsequent Seclusion and Restraint in a Psychiatric Inpatient Setting," *Psychiatric Services* 61, 2 (2010): pp. 193–195.
22. J. Raboch et al., "Use of Coercive Measures During Involuntary Hospitalization: Findings From Ten European Countries," *Psychiatric Services* 61, 10 (2010): pp. 1012–1017.
23. J. DeSantis et al., "Geropsychiatric Restraint Use," *Journal of the American Geriatrics Society* 45, 12 (1997): pp. 1515–1518.
24. B. Berland et al., "Patient Characteristics Associated With the Use of Mechanical Restraints," *Journal of General Internal Medicine* 5, 6 (1990): pp. 480–485.
25. T. Steinert et al., "Diagnosis-Related Frequency of Compulsory Measures in 10 German Psychiatric Hospitals and Correlates With Hospital Characteristics," *Social Psychiatry and Psychiatric Epidemiology* 42, 2 (2007): pp. 140–145.
26. M. Gerolamo, "The Conceptualization of Physical Restraint as a Nursing-Sensitive Adverse Outcome in Acute Care Psychiatric Treatment Settings," *Archives of Psychiatric Nursing* 20, 4 (2006): pp. 175–185.
27. L. C. Mion et al., "Effect of Situational and Clinical Variables on the Likelihood of Physicians Ordering Physical Restraints," *Journal of the American Geriatrics Society* 58, 7 (2010): pp. 1279–1288.
28. Canadian Institute for Health Information, *Ontario Mental Health Reporting System Resource Manual, 2011–2012, Module 1—Clinical Coding* (Ottawa, Ont.: CIHI, 2011).
29. D. Stewart et al., "Manual Restraint of Adult Psychiatric Inpatients: A Literature Review," *Journal of Psychiatric & Mental Health Nursing* 16, 8 (2009): pp. 749–757.
30. L. DeBenedictis et al., "Staff Perceptions and Organizational Factors as Predictors of Seclusion and Restraint on Psychiatric Wards," *Psychiatric Services* 62, 5 (2011): pp. 484–491.
31. K. A. Talerico et al., "Mental Health Correlates of Aggression in Nursing Home Residents With Dementia," *Gerontologist* 42, 2 (2002): pp. 169–177.
32. J. Duxbury, "An Exploratory Account of Registered Nurses' Experience of Patient Aggression in Both Mental Health and General Nursing Settings," *Journal of Psychiatric and Mental Health Nursing* 6, 2 (1999): pp. 107–114.
33. K. A. Huckshorn, "Reducing Seclusion Restraint in Mental Health Use Settings: Core Strategies for Prevention," *Journal of Psychosocial Nursing and Mental Health Services* 42, 9 (2004): pp. 22–33.