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_____ **Research Report** _____

**Review of the Prison Crowding and
Double-Bunking Literature**

Ce rapport est également disponible en français. Pour en obtenir un exemplaire, veuillez vous adresser à la Direction de la recherche, Service correctionnel du Canada, 340, avenue Laurier Ouest, Ottawa (Ontario) K1A 0P9.

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**Review of the Prison Crowding and
Double-Bunking Literature**

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November 2012

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Executive Summary

Key words: *crowding; double-bunking; accommodation strategies.*

A number of Canadian criminal justice organizations, including Correctional Service of Canada (CSC) have linked prison crowding and double-bunking with safety concerns for other offenders, correctional staff, and the public. This report reviews the literature on the association between crowding and offender outcomes, with a focus on institutional misconduct. By understanding if issues, such as institutional misconduct, can possibly develop from an increase in the offender population, CSC can implement effective strategies to reduce the effects on offenders and staff.

Institutional crowding can be viewed from two common perspectives. An institutional-level measure of crowding, or population density, is the most common perspective taken. Alternatively, an individual-level perspective can be taken which views crowding as a perceived constraint by the individual. These varying perspectives, in addition to a range of methodologies used, have led to conflicting results on the relationship between crowding and institutional misconduct. Several meta-analyses have been conducted to provide a summary of the results, and they generally conclude there is a small effect of crowding on institutional misconduct. Nonetheless, there may be impacts in other areas such as offenders' levels of stress; therefore, strategies should be developed and implemented to effectively deal with the changing offender population and the potential for increased crowding that may occur.

CSC has several accommodation strategies in place to deal with the increases in the offender population, many of which are also practised by other countries experiencing increasing offender populations. One short-term strategy used by all the countries included in the review is double-bunking (i.e., assigning two offenders to an accommodation space originally intended for one). Currently, the limited research that exists indicates that double-bunking may be associated with negative outcomes such as higher illness complaints, higher perceived crowding of the environment, and higher rates of non-aggressive infractions. However, research also demonstrates that double-bunking can be implemented without an increase in risk to offenders or staff, if implemented properly. Policies such as maintaining the current level of services offered and matching offenders prior to double-bunking is one method to ensure risk stays at a minimum. This can involve the use of an assessment tool that helps to structure the correctional staff's evaluation, and ensures all the relevant factors are considered when deciding which offenders would be best paired together.

In light of the current evidence, it is important that CSC continue to consider and plan to address the potential effects of crowding and double-bunking when developing strategies to handle potential increases in the offender population. Furthermore, prospective research should be done to evaluate the effectiveness of the strategies CSC develops and to help guide future policy.

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Introduction

Risks associated with institutional crowding and double-bunking have been highlighted by several Canadian criminal justice organizations. The Office of the Correctional Investigator points out that “Prison crowding is linked to increased levels of institutional violence and unrest and may be a contributing factor to higher incidences of disease transmission and infection rates in federal penitentiaries” (OCI, 2011, p. 38). The Union of Canadian Correctional Officers have also made associations such as “Double bunking is an unsafe, ineffective means by which to address a population management, and will inevitably prove problematic for correctional officers, correctional staff, offenders, CSC [Correctional Service Canada], and finally, the general public.” (UCCO, 2011, p. 3). These possible risks have also been recognized by CSC, stating in the 2011-2012 Report on Plans and Priorities “Double bunking at these levels increases the risk to safety and security in institutions because of pressures that inevitably arise in crowded conditions combined with the tensions that exist with some inmate groups.” (CSC, 2011, p. 12).

While the federal offender population has not grown as rapidly due to recent legislative changes as initially expected, there has been some growth. Between March 2010 and March 2012 the federal inmate population in Canada increased by approximately 900 or 6.3 per cent. Commissioner’s Directive 550 is responsible for inmate accommodation within CSC and identifies “...single accommodation as the most desirable ... method of housing offenders.” (p. 2). To address the immediate inmate growth needs, however, CSC has adopted several temporary strategies until other medium and long term accommodation plans come to fruition. One of the strategies is “... the installation of temporary accommodation measures (including double-bunking) in select institutions and cells...” (CSC, 2011, p. 12). Thus, as the offender population increases, CSC will provide double-bunking accommodation to some offenders. To be prepared to address any increased risk, and to inform future policy, we must understand the potential effects of crowding and double-bunking on staff and the offender population.

The purpose of this paper is to review the current body of knowledge (up to 2011) on the effects of prison crowding and double-bunking as a strategic short-term response. First, this paper will discuss definitional issues surrounding crowding. This will be followed by a review of the literature on the effects of crowding on offenders. Next, a summary of strategies currently

utilized by CSC will be presented, followed by a comparison of what practices currently occur in other western countries to accommodate growing offender populations. Since double-bunking is one strategy CSC and many other correctional organizations use, the next section will review the literature on the effects double-bunking can have on offenders. Finally, the paper will highlight best practices for double-bunking, specifically with regards to matching of offenders for shared accommodation. The report will then conclude with a summary of the findings along with future policy and research implications.

Definition of Crowding

Crowding has been defined as “an attributional label applied to a setting when situational density results in a loss of personal control” (Schmidt & Keating, 1979; p. 680). Although there are debates around the subjective nature of the concept and its measurement, crowding is primarily characterized by two factors: excess stimulation and lack of privacy (Ekland-Olson, Barrick, & Cohen, 1983; Gove, Hugues & Galle, 1979).

The term “crowding” is often used interchangeably in the literature with “density” (Tartaro, 2002); however, the two concepts have slightly different meanings. Crowding refers to a perceived constraint within a physical environment, whereas density refers to the physical amount of space available (Stokols, 1972). Thus, crowding is measured at an individual level and uses subjective measures related to offender perceptions of their personal space within, for example, the correctional environment (Klofas, Stojkovic, & Klalinich, 1992; Tartaro, 2002).

The term density is commonly what is meant when people refer to crowding, as it takes an institutional, or aggregate, perspective. Density can be divided into spatial and social density. Spatial density refers to the physical space allotted per individual (i.e., number of inmates in relation to designed capacity) and can be measured by the design capacity (i.e., capacity originally intended by the architectural structure of the prison), by the rated capacity (i.e., capacity established by correctional officials), or by the operational capacity (i.e., capacity linked to efficient management practices with an institution) (Tartaro, 2002). Social density relates to personal privacy and can be operationalized as the type of housing in which individuals co-exist (e.g., number of inmates per cell/dorm) (Loo, 1973; Mullen, 1985; Tartaro, 2002). The institutional level perspective is more commonly used for policy research and decision-making because of its objective nature (Cox, Paulus & McCain, 1984; Steiner & Wooldredge, 2009), although there is debate surrounding what constitutes “acceptable” institutional capacities (Klofas et al., 1992). Despite the conceptual differences between crowding and density, crowding is often used to refer to either method of measurement (Tartaro, 2002), and thus for the purpose of this report, the term crowding will encompass both the individual and institutional perspectives, unless otherwise specified.

Effects of Institutional Crowding

Over the past few decades, the growth of prison populations has generated concern amongst scholars, practitioners, and policy makers regarding the potential effects of crowding on institutional conduct and offender safety (Camp, Gaes, Langan & Saylor, 2003; Eckland-Olson, et al., 1983; Franklin, Franklin & Pratt, 2006; Gaes & McGuire, 1985; Harer & Steffensmeir, 1996; Pelissier, 1991; Riverland, 1999; Steiner & Wooldredge, 2009; Vaughn, 1993). Many researchers have published results indicating a relationship exists between institutional crowding and misconduct, although the direction of the relationship has varied (Fry & Frese, 1992; Gillespie, 2005; Harer & Steffensmeier, 1996; Huebner, 2002; Megargee, 1977; Pelissier, 1991; Ruback & Carr, 1993; Sechrest, 1991; Tartaro, 2002; Useem & Reisig, 1999; Walters, 1998; Wooldredge, Griffin, & Pratt, 2001). Other researchers have conducted similar studies in which no direct significant relationship could be established between crowding and institutional misconduct (e.g., Bonta & Kiem, 1978; Camp et al., 2003; Eckland-Olson et al., 1983; McCorkle, et al., 1995; Gaes, 1985; Grover, MacKenzie, & Armstrong, 2000). Many of these studies did however find significant correlations between offender misconduct and administrative measures (e.g. strictness in administrators' decision-making and practices, staff's reinforcement of rules, sanctions, etc.) and types of control in place at the institutions, suggesting a more indirect link between crowding and offender behaviour (Franklin et al., 2006; Klofas et al., 1992). These results have been demonstrated using various analytical models (e.g., aggregate level models, bi-level pooled models, and bi-level ANOVA/hierarchical modeling) and a diverse range of measures serving to operationalize the concepts of "crowding" and "misconduct". The levels of significance have consequently varied throughout the studies, depending on the measures employed.

Institutional Level of Crowding

Initial research on crowding focused on the total prison population size (Dunlop, 1974; Farrington & Nuttall, 1980; Megargee, 1977; South Carolina Department of Corrections, 1973; Sylvester, Reed & Nelson, 1977), and demonstrated that offenders incarcerated within prisons with low inmate populations had lower rates of incidents and reconvictions. Furthermore, Paulus, McCain and Cox (1981) found that institutions with fewer offenders reported a lower rate of

health problems (death, suicide, self-injury and psychiatric commitment) and thus recommended that institutional population be limited to between 500 and 1000 offenders. To build on these studies, the research that followed introduced spatial density as a measure of crowding. These studies found that the physical living space available to offenders (i.e., density) was associated with offender misconducts (Carr 1980; Ellis 1982; McCain, Cox, & Paulus, 1980; Megargee, 1977; Nacci, Teitelbaum, & Prather, 1977).

Social density has also been explored as a measure of crowding (see Bonta & Gendreau, 1994; Cox et al., 1979; Ellis 1984; McCain et al., 1980; Nacci et al., 1977; Paulus, 1988; Paulus & McCain, 1983; Pelissier, 1991; Schaeffer, Baum, Paulus, & Gaes, 1988; Tartaro, 2002). The research assessing crowding through offender housing types (double-bunking, dormitories, cubicles, etc.) has produced interesting findings in terms of offender behaviour and health, with some studies supporting single accommodation and others finding no significant relationship with social density. For instance, Schaeffer et al. (1988) studied offenders in three types of accommodation (single cells, dormitories and cubicles) and found that offenders in single cells reported lower levels of perceived crowding and urinary catecholamines (used as a biochemical indicator of stress) than offenders in other housing types.

Pelissier (1991) on the other hand found that social density had no significant effect on staff or offender attitudes towards various aspects of correctional life/work (e.g., policies, procedures, programs, services, and job satisfaction), nor on negative behaviour among offenders. The author did suggest, however, that variables not controlled in the analyses, such as responses to the crowding by the correctional administration, could be responsible for the absence of negative effects. For example, the institution had increased its housing capacity by 30% combined with additional staff and resources to address the increasing offender population. These findings support claims made by Walters (1998) who suggested that institutional responses to crowding such as inmate programs and additional staff, may mitigate the negative effects of increasing offender populations (Tartaro, 2002). Furthermore, based on the work of Ellis (1984) who proposed a theoretical model in which social density, violence and crowding were linked to a series of mediating variables such as age, social control, scarcity, and transiency levels, Tartaro (2002) empirically tested similar variables (jail-level offender characteristics and offender supervision variables). Tartaro found that while social density was significantly associated with inmate behaviour in some instances, the relationship did not persist when taking

into account other variables. Similar results were obtained by Tartaro and Levy (2007) who measured the impact of social density on inmate-inmate assaults and inmate-staff assaults in direct supervision jails.

Of all the research conducted on the topic of population density, only a few studies have established a threshold at which crowding becomes a significant issue. While various U.S. criminal justice organizations (e.g., US Department of Justice, American Correctional Association, Federal Bureau of Prison, etc.) have agreed that a minimum cell size standard be between 60 and 80 square feet per individual (as noted by Thornberry and colleagues, 1982), it is not clear if a living area smaller than this would have a detrimental effect. Studies by Cox, Paulus, and McCain (1984) and Gaes (1982) did not find a significant association between health related issues (complaints and illnesses) and the various sizes of single cells, ranging from 48 to 60 square feet, and from 38.5 to 54 square feet respectively.

In light of the mixed findings, many researchers have suggested that population density (social or spatial) is not the best indicator of crowding. Indeed, Gaes (1985) suggested that unless the level of crowding in institutions reached extremely severe levels, population density, was not to be considered as the singular cause of stress-induced illnesses and pathologies.

Individual Level of Crowding

Alternatively, a variety of different approaches have been taken in trying to understand the precise effect of crowding on offenders and institutional misconduct. For instance, Cox, Paulus, and McCain (1984) stated that research on crowding should concentrate on the processes that lead to the negative effects, rather than on fixed criteria and measures of crowding. This model, based on factors such as “uncertainty, cognitive load, and goal interference” (Paulus & McCain, 1984; p.1148), implies that the individual response to the density of correctional population is the result of a subjective perception of one’s conditions. Moreover, Megargee (1977) and Bonta and Nanckivell (1980) referred to the concept of “chronicity” to explain how the length of time of exposure to crowding conditions may have an impact on the offender’s perception of crowding and thus on negative behaviour. Offenders who are aware that the crowding situation is temporary would be less prone to violent behaviours than those who see no escape (Megargee, 1977). Bonta (1986) presented a similar idea where the response of offenders

to the length of exposure to crowding could be observed by a continuum of physiological stresses, discomforts and behaviours, going from low to high on a disruption level scale. Finally, Ellis (1984) and Tartaro (2002) explored transiency variables which can be described as the “rate at which persons in prison living/work/recreational spaces are changed” (Ellis, 1984, p. 289). The rapid pace of transiency has been thought to impact social control practices and thus offender behaviour/perception.

Review of Meta-Analyses on Crowding

Significant efforts have been made to provide narrative and meta-analytic reviews of the numerous studies on crowding to establish general trends and to provide an explanation for the mixed results (Steiner & Wooldredge, 2009). Bonta and Gendreau (1990) first undertook a qualitative review and meta-analysis of 26 empirical studies on the effects of crowding. Although results indicated that crowding increased the likelihood of offenders experiencing psychological and physiological stress (measures greatly varied throughout studies), effects of crowding on disruptive behaviour were not as evident and thought to be more related to other types of variables (e.g., age and variations in inmate population compositions).

Gaes (1994) conducted a narrative review of various studies on the effects of crowding which highlighted the contrasting results throughout the existing literature. For some studies, the effect was quite significant, whereas for others, the results simply showed no relationship. These varying findings were partially explained by cross-study differences in terms of units of analysis, definitions of crowding, and statistical variables. Gaes did not, however, dismiss crowding effects, but insisted on the importance of considering the interaction of other individual factors with increased offender misconduct, as well as integrating individual and contextual theories of misconduct.

The same conclusion was reached by Gendreau, Goggin, and Law (1997) who conducted a meta-analysis of 39 studies showing an existing but weak effect of crowding on institutional misconduct. The authors agreed that the relationship between the two might be better explained by other situational factors (i.e., inmate turnover, type of inmate, program availability, and management style). The issue of subjectivity surrounding the measure of crowding was also identified as being potentially responsible for the inconclusive findings and it was suggested that

further work needed to be conducted on inmates' perception of environmental constraint.

More recently, Franklin, Franklin, and Pratt (2006) undertook a similar meta-analysis of 16 studies (from 1978 to 2002) establishing correlations between various measures of inmate misconduct and measures of inmate crowding. The purpose of this research was to evaluate the average effect and to determine how different methodologies could influence the outcome. Results were similar to that of earlier reviews; crowding was a weak, but statistically significant, predictor of correctional misconduct.

Finally, in a review of differences across studies examining the link between crowding and institutional misconduct, Steiner and Wooldredge (2009) identified four areas of disparity that could explain the wide-ranging and contradicting results: "(a) unit analysis and operational definitions of 'crowding' and 'misconduct' (b) theoretical process underlying crowding effects; (c) considerations of possible direct, indirect and conditioning effects of crowding on misconduct; and (d) modelling techniques" (p.206). They have also demonstrated that employing different methodologies can result in different findings despite using the same sample (Wooldredge & Steiner, 2009). The authors concluded that a more consistent approach to analysing this issue was necessary in order to develop results that would realistically inform and benefit policy makers and practitioners (Wooldredge & Steiner, 2009).

Thus far, no definite conclusion has been reached within the vast literature regarding the direct impact of correctional population density on offender behaviour, though meta-analytic results suggest the two are weakly related. The majority of the studies previously reviewed were however focused on correctional misbehaviour and aggression in offenders. It is also believed that other aspects of correctional living, such as offender health and quality of life, may be impacted by crowding and should be researched further. Some exploratory work has been undertaken on these topics (Cox et al., 1984; D'Atri, Fitzgerald, Kasl, & Ostfeld, 1981; Gaes, 1985; Goodstein & Wright, 1989; McCain et al., 1980). Table 1 presents a summary of the potential impacts related to crowding as identified in the literature. For example, concerns have been raised about potential reduced availability of programs, reduced flexibility in terms of movement between units and institutions, reduced staff to offender ratios, increased staff turnover, increased physical and mental health issues for offenders, and increased risk for recidivism in the community. Furthermore, it has been suggested that factors such as demographic characteristics (e.g., age, race), sentence/institutional characteristics (e.g., sentence

length, level of noise, lighting), and correctional administration variables (e.g., supervision type, offender turnover) could explain the detrimental effects observed in correctional settings where crowding is reported (Bonta, 1986; Farrington & Nuttall, 1980; Gendreau, Goggin, and Law, 1997), or could at least be considered as functional correlates (Cox et al., 1986).

Table 1 *List of Potential Impacts Related to Crowding*

Impact/Issue	Source
Operations	
Reduced administrative flexibility for classification decisions according to security, treatment, and needs	<ul style="list-style-type: none"> ▪ Clements, 1982 ▪ Klofas et al., 1992 ▪ Mullen, 1985
Reduced administrative flexibility for new inmate arrivals & transfers	<ul style="list-style-type: none"> ▪ Tartaro, 2002
Reduced availability of programs, services, and employment/education opportunities	<ul style="list-style-type: none"> ▪ Bonta & Gendreau, 1990 ▪ Pelisier, 1991 ▪ Kupers, 2008 (visits) ▪ Mullen, 1985 ▪ Wooldredge, 1994
Reduced availability of staff for offender movement & supervised activities (recreational, visits, showers, medical escorts, etc)	<ul style="list-style-type: none"> ▪ Klofas et al., 1992 ▪ Wooldredge, 1994
Management style change - Possibility of resorting to more or less rigorous controls due to lack of resources	<ul style="list-style-type: none"> ▪ Camp & Camp, 1989 ▪ DiIulio, 1987 ▪ Gaes 1985, 1994 ▪ Useem & Reising, 1999
Increased staff turnover and inadequately trained/prepared staff	<ul style="list-style-type: none"> ▪ Porporino & Dudley (1984) ▪ Tartaro, 2002

(continued)

Table 1 (continued)

Impact/Issue	Source
Offenders	
Increased perception of crowding / decreased perceived control on living arrangements	<ul style="list-style-type: none"> ▪ Cox, Paulus, & McCain, 1984 ▪ Paulus, Cox, McCain & Chandler, 1975 ▪ Paulus & Dzindolet, 1992 ▪ Ruback & Carr, 1984 (perceived control for women) ▪ Ruback, Carr, & Hopper, 1986
Increased psychological and physiological stress and illnesses	<ul style="list-style-type: none"> ▪ Bonta & Gendreau, 1990 ▪ Cox, Paulus, & McCain, 1984 ▪ D'Atri, 1975 ▪ D'Atri, Fitzgerald, Kasl, & Ostfeld, 1981 ▪ Klofas et al., 1992 ▪ McCain, Cox, & Paulus, 1976 ▪ Paulus, McCain, & Cox, 1978 ▪ Ruback, Carr, & Hopper, 1986
Increased medical/mental health visits and needs	<ul style="list-style-type: none"> ▪ Cox, Paulus, & McCain, 1984 ▪ Gaes, 1985 ▪ Paulus, 1988 ▪ Paulus, McCain, & Cox, 1978
Increased offender turnover and heterogeneous types of offenders causing conflicts	<ul style="list-style-type: none"> ▪ Ellis, 1984
Increased risk for recidivism/return to custody	<ul style="list-style-type: none"> ▪ Farrington & Nutall, 1980 ▪ Kelly & Ekland-Olson, 1991 ▪ Latimore & Backer, 1992 (simulation model)

Strategies and Solutions to Crowding

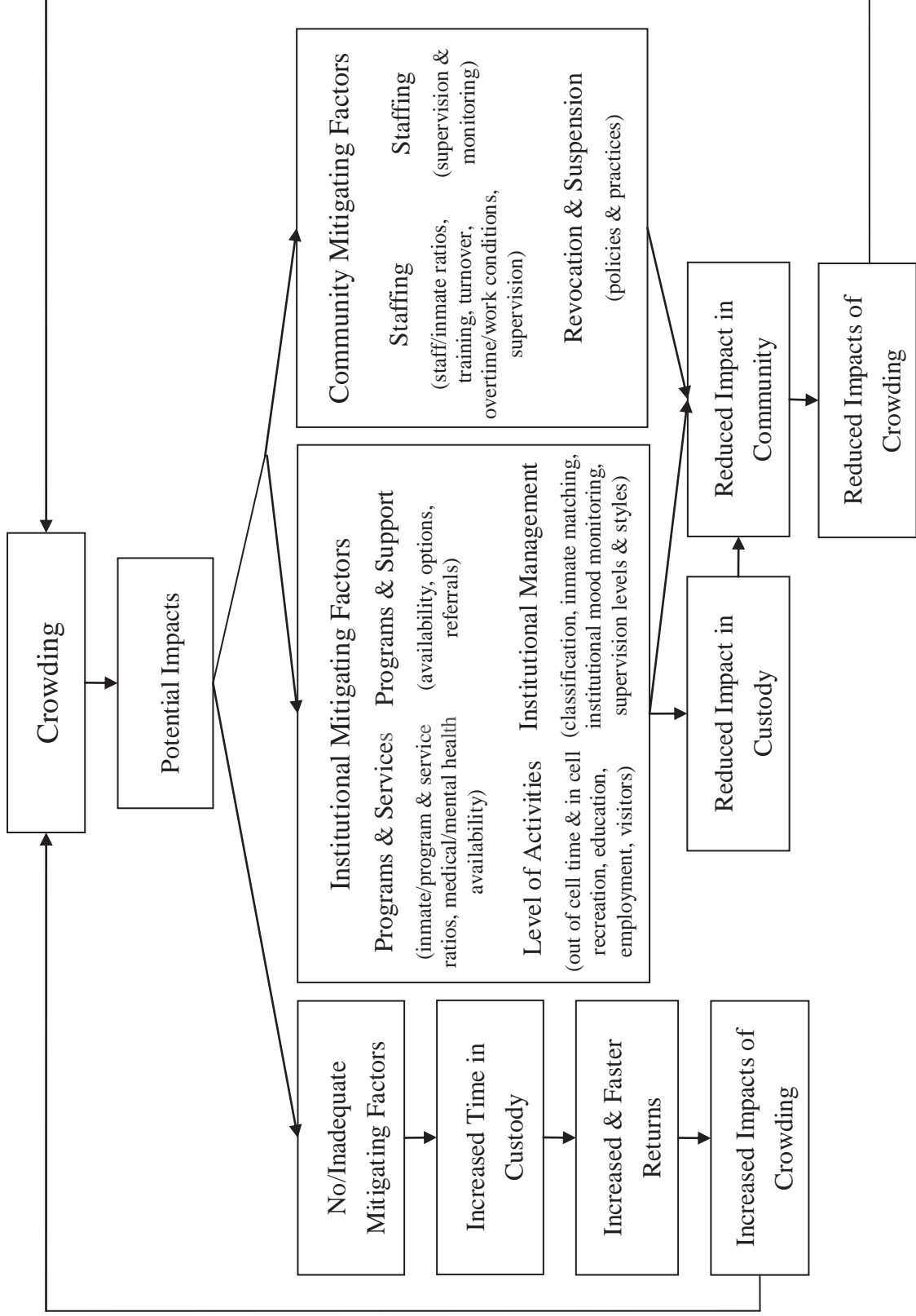
Three types of strategies have been identified in the literature for reducing prison crowding: “front door”, “back door” (Gottfredson, 1983; Snacken, 2006), and capacity expansion (Clements, 1982). Front door strategies refer to policy related measures aiming to either reduce the influx of offenders entering the correctional system by resorting to non-custody solutions (e.g., community based corrections programs) or reduce the length of sentences (Gottfredson, 1983; Griffiths & Murdoch, 2009; Skovron, 1988). Back door measures are oriented towards increasing the number of offenders being released early (e.g., through modifying criteria surrounding good time credits, parole policies, and emergency releases) (Gottfredson, 1983; Skovron, 1988). These policies are usually supported by services in the community to help with successful reintegration (Griffiths & Murdoch, 2009). A third strategy to managing crowding that is commonly used by correctional departments is institutional capacity expansion (Clements, 1982; Skovron, 1988).

In trying to propose solutions to resolve the crowding situation in prisons across the world, academics and policy-makers seem to be in agreement that any efforts invested in reducing prison crowding have to be part of a system-wide collaborative approach and cannot be solved by correctional administrations alone (Gottfredson, 1983; Griffiths & Murdoch, 2009). The International Center for Criminal Law Reform and Criminal Justice Policy (Griffiths & Murdoch, 2009) has proposed several broad strategies to address the growing prison populations. Those specific to corrections involve investing towards: 1) effective “crime prevention, rehabilitation, and offender reintegration” (p. 29; e.g., developing pre and post-release programs), 2) “improving the effectiveness of criminal justice administration” (p. 37; e.g., providing training and implementing timely processes, more effective and strategic classification and assessment planning; also see Clements, 1982; Gottfredson, 1983), 3) “developing information systems for the justice and corrections systems” (p. 41; e.g., in terms of better monitoring and recording case flow and population types to permit evaluation of crowding reduction strategies and determine best practices), and 4) “increasing prison capacity” (p. 39; e.g., building new prisons).

Although reducing prison crowding is a long-term project necessitating collaboration between the various actors of the criminal justice field (Wooldredge, 1996), immediate and

concrete actions can be taken to limit possible negative effects of crowding on all involved. As mentioned previously, many associated factors other than the presence of a large number of offenders may play a role in producing a problematic correctional environment. Figure 1 presents a possible conceptualization of the crowding problem and targets for capacity expansion strategies which could reduce the impacts and outcomes with which crowding is associated. Appendix A provides additional details for the model.

Figure 1. Conceptualization of the Impact of Crowding and Mitigating Factors



Strategies Implemented by the Correctional Service of Canada

To accommodate the growing offender population, CSC has implemented a multi-faceted approach. This approach is based on a capacity expansion strategy, as the mandate of CSC and its role within the criminal justice system in Canada limits their use of the front and back door strategies. While an accommodation strategy is still in the process of being developed, the medium-term plan is to construct new living units or expand existing units in many of its existing institutions. Construction of additional units is already underway or planned for 37 institutions, with 2,752 additional beds expected to be available by the end of 2014. Additional staff are deployed where necessary, to maintain the current level of services. In addition, CSC has planned to expand delivery of programs and services offered to offenders and victims where necessary. These include correctional, educational, and social programs to aid the offender in the rehabilitation process. Furthermore, as the number of offenders under CSC supervision in the community increases, CSC will maintain appropriate numbers of parole officers and work with community partners to ensure a safe reintegration for offenders.

Until the new accommodation space is available for use, CSC is optimizing its existing bed capacity and expanding the use of double-bunking as a temporary measure. Currently, approximately 18% of offenders are double-bunked within CSC, although double-bunking rates vary across varies across Canada. CSC is actively monitoring population changes and is responding accordingly.

Strategies Implemented by Other Correctional Organizations

A look at the prison population situation in other countries has confirmed that Canada is not the only country facing challenges with increasing correctional populations. Countries such as the United States, Australia, New Zealand, Ireland, and the United Kingdom have also experienced unprecedented growth in their incarcerated offender populations, which has resulted in significant accommodation challenges and strains on resources. A large portion of the institutions in these countries are currently operating at higher levels than maximum capacity permits and some foresee that capacity will be completely exhausted within a few years.

Table 2 provides a comparison of the solutions and strategies undertaken by five countries to overcome the challenges presented by the increasing prison population. This information was collected from official documents published by each country's respective correctional organization (see Appendix B for web links to each of the documents reviewed). Although additional strategies may be utilized by these countries, the search for this report was limited to the information that was directly linked to strategies for reducing crowding.

Numerous strategies to deal with the challenges presented by crowding were utilized among the five countries. Interestingly, the only strategy shared among all five countries was double-bunking. The rapidly growing correctional population in the United States, United Kingdom, Australia, New Zealand, and Ireland has led these countries to the implementation of double-bunking to address the crowding problem. With double-bunking being such a widely used practice, it is important that we identify what effect it can have on the offenders.

Table 2 *Strategies Implemented in Correctional Facilities by Various Countries*

	United States	United Kingdom	Australia (Western Australia)	New Zealand	Ireland
Capacity Expansion Strategies					
Infrastructure					
Implementation of double-bunking and multiple cell occupation	✓	✓	✓	✓	✓
Building new facilities	✓	✓		✓	✓
Improving/expanding existing facilities	✓	✓		✓	✓
Updating/improving security and correctional technologies/equipments	✓	✓		✓	✓
Staff					
Hiring of additional staff/maintain staff offender ratios	✓		✓	✓	✓
Resort to overtime for current staff	✓				
Provide increased training for staff on relevant topics			✓	✓	✓
Operations					
Provide new programs/services/activity (maintain ratios)	✓		✓	✓	✓
Implement new operational procedures	✓			✓	✓
Contract with private prisons, privatization of correctional services	✓	✓			✓
Implement assessment process prior to inmate pairing				✓	
Abstain from double-bunking specific inmates (max., high-risk, youth, etc.)				✓	
Implement mitigation strategies to reduce assault				✓	
Strategic planning for effective correctional staff and better resource-need matching					✓

(continued)

Table 2 (continued)

	United States	United Kingdom	Australia (Western Australia)	New Zealand	Ireland
Front Door Strategies					
Work with other justice agencies for better policies and management practices		✓			✓
Find other solutions outside of the criminal justice system		✓			
Back Door Strategies					
Reduce the length of sentences through probation management	✓				✓

Effects of Double-Bunking

Within CSC, the primary indicator of correctional crowding is referred to as “double-bunking”. Double-bunking occurs when two or more offenders reside in a cell that was designed for one individual. This practice is usually done by placing a second bunk within a cell designed for one person.

Although the effects of crowding and density have been thoroughly examined in the literature, research specific to the practice of double-bunking remains scarce. McCain, Cox, and Paulus (1980) undertook one of the first studies to empirically examine the effect of double-bunking in correctional institutions. Their findings led them to conclude that single accommodation is the preferred housing option as those offenders who were double-bunked had higher illness complaints, higher perceived crowding of the environment, and higher rates of non-aggressive infractions. There was, however, no link established between double-bunking and elevated blood pressure (a measure of physiological stress) or patterns of attendance at recreational and educational activities. These results were supported by additional studies conducted by Paulus, McCain, and Cox (1981) and Cox, Paulus, and McCain (1984) which also confirmed the negative psychological reactions of offenders housed in double-bunked cells, as well as the higher illness complaints and non-aggressive infraction rates. Additionally, double-bunked cells were rated more negatively by offenders than single cells.

In an unpublished paper presented to the National Institute of Corrections, Bounds (1985) briefly summarized the benefits of single accommodation. This form of housing is expected to allow for more administrative flexibility, better protection from sexual and physical abuse, better protection from offenders with communicable diseases, and enhanced self-concept due to the possibility of maintaining privacy and space ownership (Adwell, 1991). A study from Grant and Memmott (2007) has also concluded that the common practice of preferred double-bunking for Aboriginal offenders (in Australia) under cultural pretences was not founded. More specifically, the study demonstrates that double-bunking does not address culturally-specific needs and presents various issues for Aboriginal peoples similar to those encountered by their non-Aboriginal counterparts, such as lack of privacy and security, sexual abuse, and the spread of contagious diseases.

Adwell (1991) highlighted additional challenges associated with double-bunking offender

populations, particularly those presenting a wide variety of characteristics. For example, inmates from the general population are not always willing to share a cell with an offender with mental health problems or poor hygiene, sex offenders, homosexual offenders, or offenders requiring protective custody. Results from Ellis' study (1984) also supported such a claim. When interrogated about their views on double-bunking, offenders considered double-bunking as low-status residence and shared concerns related to showering and body odours, homosexuality, as well as the significant reduction of living space and valuable activities.

While there are challenges presented by double-bunking, there is some evidence to suggest that double-bunking can be successful with limited impact on the offender population and staff. For example, Pellissier (1991), focused on a single specific institution which was undergoing a significant population increase. After an administrative decision to employ double-bunking, the institution saw its population double over a six-month period. Analyses conducted on data collected pre- and post-population increase revealed that no significant differences had been recorded in term of rates of infractions, severity level of infractions, and disciplinary transfers. Rates of complaints by offenders slightly decreased and shifted focus in their content; offender grievances were less related to staff and disciplinary actions, and more linked to institutional programs, daily operations, and communications. Likewise, rates of illness complaints remained constant with a slight decrease in the rate of sick calls. In addition, this study inquired about staff and offender perceptions pre- and post-population increase. No significant differences were found relating to the staff's perception of job satisfaction, policy and procedure applications, and departmental responsiveness. Analyses of offenders' perception revealed that inmates expressed less overall satisfaction with staff after the population increase. Significant differences were noted for issues relating to fairness of rule enforcement and staff helpfulness. Perceived effects on food services, visiting room and commissary were also greater than anticipated. In sum, Pelissier's results tend to support the feasibility of practising double-bunking within correctional establishments. Furthermore, a two-year study in New Zealand found a small reduction of incidents occurring in facilities that had increased their double-bunking practice up to 70% of beds in some units (Department of Corrections, 2011). However, when considering the general findings from these studies, one must take into account that administrative measures may have been taken to reduce the impact of double-bunking, while ensuring to maintain the institution's operational philosophy. Moreover, Pelissier (1991)

mentioned that the special needs populations (mental health) housed at the institution presented limits to the generalization of the findings. Many courts, specifically in the United States, have judged that the practice of double-bunking, if appropriately managed, does not violate constitutional law or human rights (Adwell, 1991; Skovron, 1988; Thornberry, Call, Swanson, Shedd & Mitchell, 1982). Nonetheless, as mentioned previously, CSC has stated that single accommodation is the best method of housing offenders.

Mitigation of Risk: Assessment to Pair Offenders

Since double-bunking is common across several of the western countries, it is important to implement practices to mitigate the possible negative effect double-bunking could have on the staff and offenders. It is essential that the implementation is executed in an organized and structured fashion, and that measures are taken to reduce the potential risks and negative effects of double-bunking, such as making sure that offenders who are sharing accommodations are compatible and maintaining the current level of services. In order to ensure a safe and stable transition, the implementation of increased double-bunking requires specific adjustments to both policy and operations. First, the policy permitting double-bunking and associated guidelines must be adjusted. Second, procedures ensuring that offenders are properly paired for double-bunking must be established. While it is possible to select offenders for double-bunking solely on the professional judgement of correctional managers, research has shown that structured decision-making combining both clinical judgement and risk assessment tools (e.g., check-lists, appropriate scales) may be more effective at taking into account critical factors (Ægisdottir et al., 2006; Dawes, Faust, & Meehl, 1989; Grove & Meehl, 1996; Sawyer, 1966; Swets, Dawes, & Monahan, 2000). In addition, a structured process provides replicable results and is transparent in that it demonstrates the specific factors that were used in the decision-making process. This structured process can then be defended and its effectiveness tested. If a decision is challenged, the decision-making process will be available to demonstrate that the decision was based on the most relevant factors.

To ensure that the appropriate offenders are housed together, some correctional organizations such as the Department of Corrections in New Zealand and the HM Prison Service in the United Kingdom, have developed a “Shared Accommodation Risk Assessment” tool and

relevant policies to help guide correctional officers in their process of determining which offenders pose less risk for double-bunking. This tool consists of an assessment form which inquires about different factors regarding the offenders' behaviours (e.g., anti-social behaviour, gang affiliation, employment), beliefs (e.g., cultural/religious identify, homophobic or racist views), offence history (e.g., previous violent or sexual offences), risk level (e.g., in segregation, high risk, self-harmer), and various other personal characteristics (e.g., age group, physical characteristics, physical and mental health needs). Internet links for the policy and assessments used in New Zealand, Australia, and the UK are provided in Appendix C.

Such tools do not replace staff judgement, nor do they provide an actuarial risk score. Rather, they provide a structured procedure to gather all relevant sources of information on offenders' risk and support staff judgements by ensuring that all key factors are reviewed and incorporated in the decision making process. These tools also provide a documented record of the risk that offenders can pose in terms of shared accommodation in cases of offender movements or transfers.

In addition to the assessment tool, the HM Prison Service in the United Kingdom has implemented a Cell Sharing Risk Minimization Plan to identify risk factors and appropriate actions that can reduce the incident potential for offenders who are double-bunked. This plan addresses both the offender's and staff's concern regarding potential violence or incident triggers, as well as establishes ways to avoid them (see link in Appendix C).

Conclusion

It is clear that CSC will face population management challenges over the coming years. It is important that CSC is aware of the correctional literature on crowding and its potential effects. Due to the variety of perspectives and operational definitions that can be used for crowding, in addition to the variety of research approaches and analyses utilized, the evidence is not clear about the impact crowding has on the inmate and staff. Overall, however, it appears that there is a small effect of crowding on institutional misconduct. Several studies suggest the relationship that does exist could be influenced by other external factors, although additional research is needed in this area. The literature does suggest a relationship exists between crowding and psychological and physiological stress for offenders, although this also requires more attention. These associations with crowding cannot be ignored, and thus strategies must be implemented to address the potential impacts of an increase in offenders.

CSC has demonstrated its commitment to reducing the impact of crowding by developing various strategies. These practices are also carried out by many countries around the world and include: physical capacity expansion, hiring of staff in parallel with population growth, expanded delivery of programs and services to ensure effective rehabilitation practices, and support for additional community supervision.

One of the most commonly utilized short-term strategies is double-bunking. While there has been considerably less research on the impact of double-bunking on offenders, the preliminary research does suggest that double-bunking can be implemented with minimal increased risk for offenders or staff, provided appropriate policies and procedures (e.g., offender matching, maintaining current level of services) are in place. Nonetheless, scholars and criminal justice organizations, including CSC, agree that double-bunking should not become a common practice or a long-term strategy in correctional facilities.

The effect that crowding and double-bunking has on offenders should be prospectively investigated as CSC develops a strategy to manage a complex and diverse offender population. Additionally, as CSC's offender population increases, the strategies that are implemented should be evaluated for their effectiveness of reducing crowding and the potential negative outcomes associated with it.

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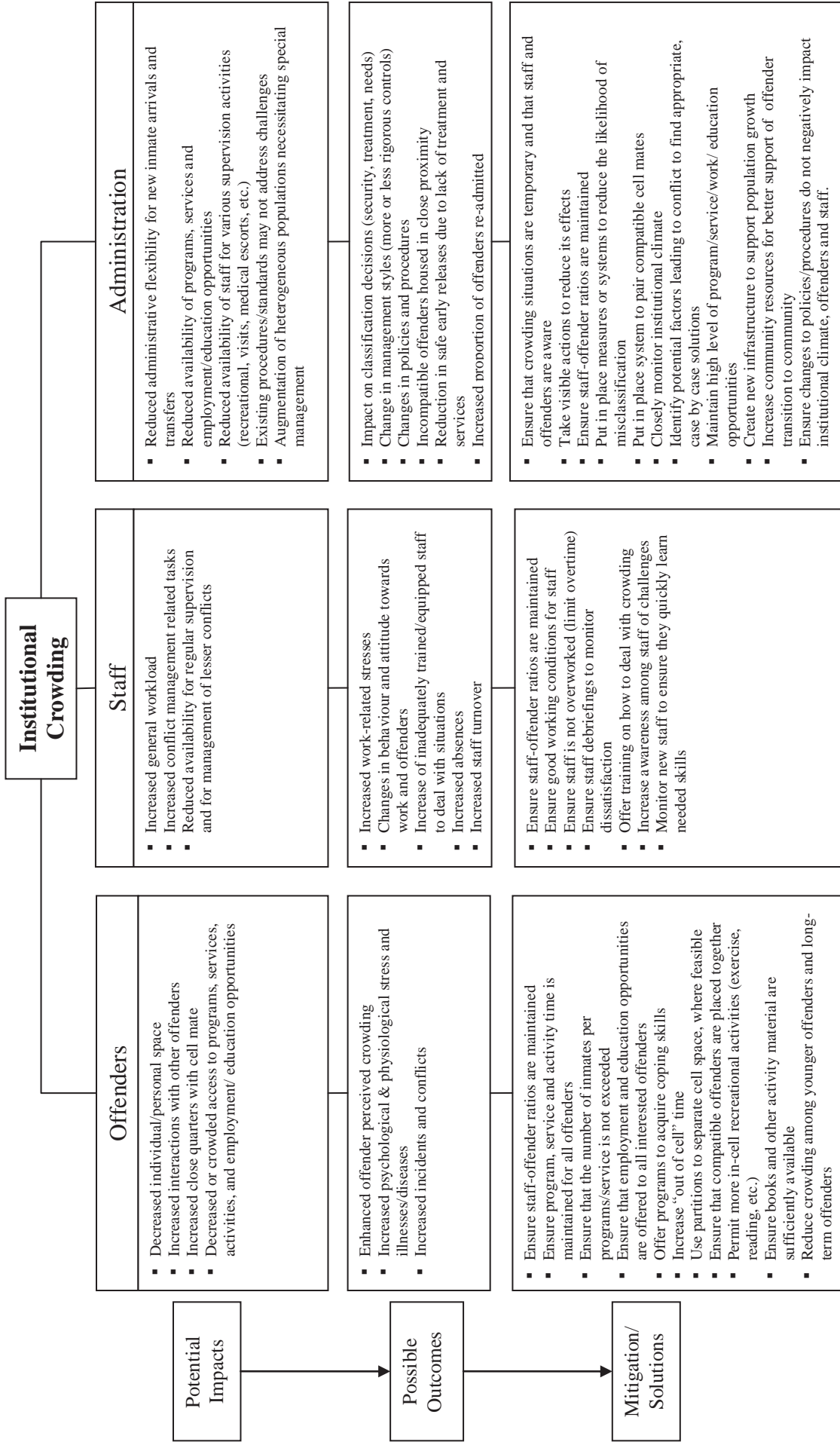
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doi:10.1080/07418820802427841

Appendices

Appendix A. Conceptualization of Potential Impacts of and Solutions to Crowding



Appendix B: International Correctional Organizations Documents Reviewed

Australia:

Department of Corrective Services (2010) *Annual Report 2009-2010*. Perth, WA: Department of Corrective Services. Retrieved from http://www.correctiveservices.wa.gov.au/_files/about-us/statistics-publications/dcs-annual-report-2009-2010.pdf

Department of Corrective Services (2009). *Annual Report 2008-2009*. Perth, WA: Department of Corrective Services. Retrieved from http://www.correctiveservices.wa.gov.au/_files/about-us/statistics-publications/dcs-annual-report-2008-2009.pdf

Ireland:

Irish Prison Service (2001). *Strategy Statement 2001-2003*. Longford: Irish Prison Service
http://www.irishprisons.ie/documents/Strategy_statement.pdf

Irish Prison Service (2009). *Annual Report 2009*. Longford: Irish Prison Service
<http://www.irishprisons.ie/documents/AnnualReport2009PDF.pdf>

Office of the Inspector of Prisons (2009) *Annual Report 2008*. Nenagh, Ireland: Inspector of Prisons. <http://www.inspectorofprisons.gov.ie/en/IOP/Annual%20Report%202008%20-%20Inspector%20of%20Prisons.pdf/Files/Annual%20Report%202008%20-%20Inspector%20of%20Prisons.pdf>

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New Zealand:

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