

# Shared Clients: Health, Mental Health, and Social Characteristics of High Users of the Health, Justice, and Community and Social Support Systems

## EXECUTIVE SUMMARY

High users of multiple systems, also called multiple or complex needs clients, make up a minority of the population in Alberta but require a significant amount of services from the health, justice, and community support systems. Services for these clients are often fragmented, acting as silos with conflicting rules, procedures, eligibility requirements and scheduling challenges, which make it difficult to navigate the system and receive the right services at the right time.<sup>1-4</sup>

This report<sup>a</sup> describes young adults in Alberta who were users of multiple systems or “Shared Clients.” To be considered a “Shared Client”, an individual had to be a high user of all three systems between 2005/06 and 2009/10. Specifically, they had to a) be in the top 10% of emergency department users (ER), b) be a prolific offender with 5 or more charges (Justice), and c) have received Assured Income for the Severely Handicapped or Income Support (AISH/IS) in that five-year period. Shared Clients were compared to other sub-populations of systems users: high users<sup>b</sup> of two systems (ER & AISH/IS, Justice & AISH/IS, Justice & ER), high users of one system (ER, Justice, AISH/IS), and low users of the systems (Low). The characteristics of the different types of systems users were compared for the 2005/05 to 2009/10 fiscal years, and then they were followed forward to the 2010/11 fiscal year to explore outcomes.

### KEY FINDINGS

**Between 2005/06 and 2009/10, of the 1,186 Shared Clients:**

- 43% were female, 60% of whom gave birth
- 80% received a diagnostic code for substance use
- 14% received a diagnostic code for a traumatic brain injury
- 65% had been assaulted requiring medical attention in a hospital, emergency room or outpatient clinic
- Shared clients moved an average of 3.2 times and were more likely to receive a diagnostic code for a mental health condition than the other profiles

**In 2010/11, of the 1,186 Shared Clients identified between 2005/06 and 2009/10:**

- 49% reoffended
- 46% received Income Support
- 37% received a diagnostic code for substance use
- 19% of females gave birth
- Shared clients visited the emergency room 4.8 times, on average

**Indicators such as assault and substance use are known to be under-reported in administrative data. Therefore these are likely conservative estimates of the proportion of youth who have had those experiences and conditions.**

<sup>a</sup> This report is part of the Longitudinal Project conducted by the CYDL in collaboration with Alberta partnering government ministries. Please see the last page for a brief description of the project and go to <https://policywise.com/data/p2/> to access other deliverables.

<sup>b</sup> Ministry partners indicated that the most useful marker of a “high user” of AISH or Income Support would be an individual that was admitted and discharged from the programs in rapid succession, rather than the total number of years on AISH or Income Support. Unfortunately only the year that an individual was supported by those programs was included in the Income Support data, meaning it would not be possible to identify true “high users”. Therefore the marker for AISH or Income Support is any use of either these programs at any time during the 5 year period. We acknowledge that this isn’t really high use of these programs; however, for ease of discussion the term high users will be used to refer to individuals who are recipients of AISH or IS and are high users of the ER and/or of the Justice system.

## BACKGROUND

These analyses emerged from a workshop where PolicyWise worked with our ministry partners to determine topics that would be useful across ministries. One of the populations of interest was individuals who were high users of multiple systems. Front-line staff described clients who are involved in many systems, that is, programs under the oversight of different ministries, as sometimes falling through the cracks because of the complexity of their needs and the difficulty of navigating and adhering to the conditions placed upon them by multiple systems. Research has found that multiple system users (often called multiple or complex needs clients), are more likely to experience homelessness, co-occurring health needs such as mental health and substance misuse conditions, and are more likely to be involved in the justice system.<sup>1-4</sup> They have also been shown to have difficulty discovering what services are available to them and, if they are aware of services, they often have difficulties accessing those services.<sup>4</sup> Services for these groups are often fragmented, creating delivery “silos” with conflicting rules, procedures, eligibility requirements and scheduling challenges making it difficult for clients to navigate the system and access the right services at the right time.<sup>4</sup>

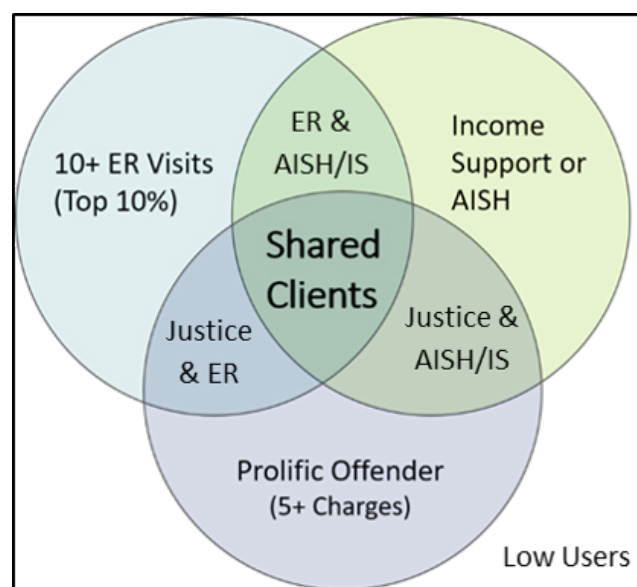
This report describes young adults in Alberta who, during the 2005/06 to 2009/10 fiscal years, were in the top 10% of emergency department (ER) users, were considered prolific offenders with 5 or more charges, and received Assured Income for the Severely Handicapped (AISH) or Income Support. These individuals were identified as “Shared Clients” and as high users of the respective systems. The definition of a Shared Client was developed in conjunction with our ministry partners to ensure that it provided useful information for policymakers, given the limitations of administrative data.

Shared Clients were compared to seven other sub-populations, shown on Figure 1 and described in Table 1 (page 3).

- High users of two systems: ER & AISH/IS, Justice & AISH/IS, Justice & ER (2 Systems)
- High users of only one system: ER, Justice, AISH/IS (1 System)
- Low users of all systems (Low)

All individuals in this report were between the ages of 18 and 25 years in the 2005/06 fiscal year.

The report first describes the characteristics of each group in the 2005/06 to 2009/10 fiscal years, including gender and reproduction, social circumstances such as homelessness and substance use, and then indicators of mental and physical health such as self-harm, assault and traumatic brain injury. The second part of the report follows the different groups longitudinally through time to the 2010/2011 fiscal year to determine the rate of different health and social outcomes for each group. Linked administrative data from the Child and Youth Data Laboratory’s Longitudinal Project was used as it is well suited for analyses that require cross-ministerial consideration. Please see Appendix A for data notes that further describe the data and the methods.



**Figure 1.** Diagram describing the overlap and possible combinations between high users of emergency departments, high users of the justice system, and recipients of AISH/IS, in young adults age 18 to 25 years

**Table 1. Descriptions of the 8 different sub-populations described in the analyses**

High User of	Sub-Population	Description
0 Systems	Low	Low users or non-users of all systems
1 System	AISH/IS	Recipients of AISH/IS only
	ER	High users of the ER only
	Justice	High users only of the Justice system
2 Systems	ER & AISH/IS	High users of the emergency room and AISH/IS
	Justice & AISH/IS	High users of the Justice system and AISH/IS
	Justice & ER	High users of the emergency room and of the Justice system
3 Systems	Shared Clients	High users of the emergency room, AISH/IS and the Justice system

## FINDINGS

In Alberta, there were 317,318 young adults between the ages of 18 and 25 years in the 2005/06 fiscal year registered in the Alberta Health Insurance Plan during the entire study period. The vast majority (86%) of young adults were not considered high users of any system (Table 2). Table 2 shows the number of people in each category. These categories correspond to the intersections on Figure 1 (page 2).

**Table 2. Number of individuals in each sub-population described in the analysis**

High User of	Sub-Population	Population
0 Systems	Low	273,336
1 System	AISH/IS	15,200
	ER	15,842
	Justice	3,949
2 Systems	ER & AISH/IS	4,894
	Justice & AISH/IS	1,916
	Justice & ER	995
3 Systems	Shared Clients	1,186
	Grand Total	317,318

The sex<sup>c</sup> distribution varied drastically between the sub-populations (Figure 2, page 4; Table 3, page 4). Females made up 61% of all high users of ERs and 64% of all users of AISH/IS but only 21% of all prolific offenders. When breaking these populations down into sub-populations, however, the proportion of females is much higher in sub-populations that are high users of the ER or AISH/IS. For instance, while only 10% of high users of only the Justice system are female, 16% of high users of both Justice & the ER are female, 33% of high users of both the Justice system and AISH/IS are female, and 43% of Shared Clients are female.

<sup>c</sup> A limitation of the CYDL administrative data is that only binary gender categories are available. We use the word “sex” rather than “gender” to acknowledge this limitation.

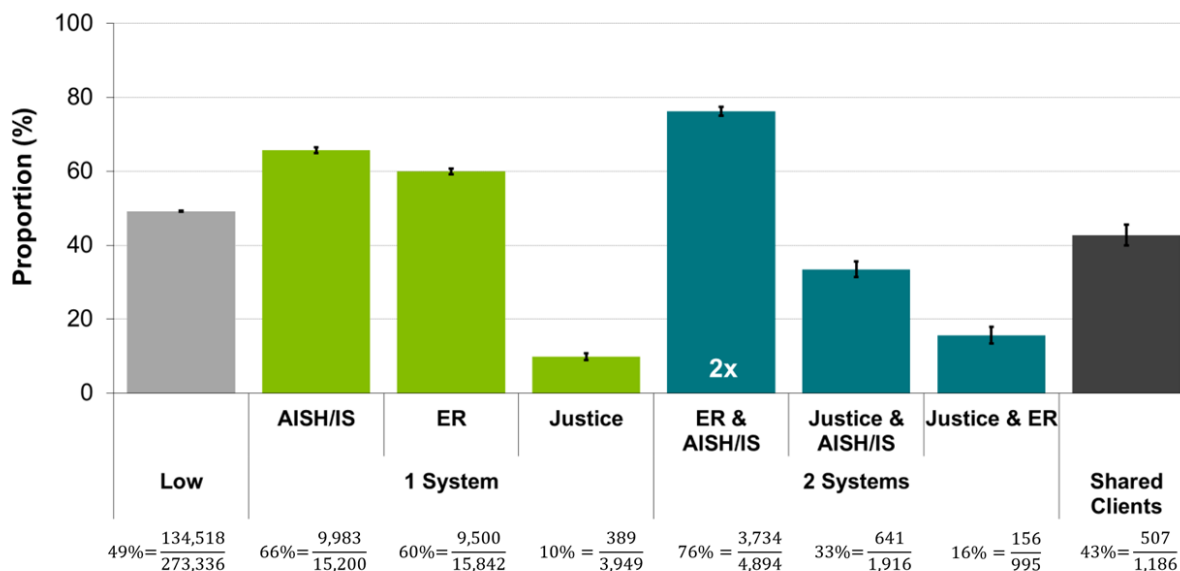


Figure 2. Proportion of young adults (18 to 25 years) who are female<sup>d</sup>

Table 3. Proportion of young adults (18 to 25 years) who are female.

High User of	Sub-Population	N Female	Population	% Female
0 Systems	Low	134,518	273,336	49%
1 System	AISH/IS	9,983	15,200	66%
	ER	9,500	15,842	60%
	Justice	389	3,949	10%
2 Systems	ER & AISH/IS	3,734	4,894	76%
	Justice & AISH/IS	641	1,916	33%
	Justice & ER	156	995	16%
3 Systems	Shared Clients	507	1,186	43%
Grand Total				317,318

### Pregnancies and Births

To better understand the needs of female shared clients and the constraints they face, the proportion of young women who experienced pregnancy during the first 5 years of the study was analyzed.

**High users of any system were more likely to have experienced at least one pregnancy, with shared clients, high users of the Justice & AISH/IS, and high users of the ER & AISH/IS with the highest rates (77%, 78%, and 78%, respectively)** (Figure 3, page 5).

While some of these pregnancies may have resulted in miscarriage or abortion, 59% of shared clients experienced at least one birth during that time period, as did 65% of high users of the ER & AISH/IS, and 60% of high users of Justice & AISH/IS (Figure 4, page 5). In contrast, only 35% of young women who were low users of systems experienced a pregnancy during that time period, and 24% of low systems users had at least one delivery. This is half as much as shared clients.

<sup>d</sup> Error bars on graphs represent 95% confidence limits.



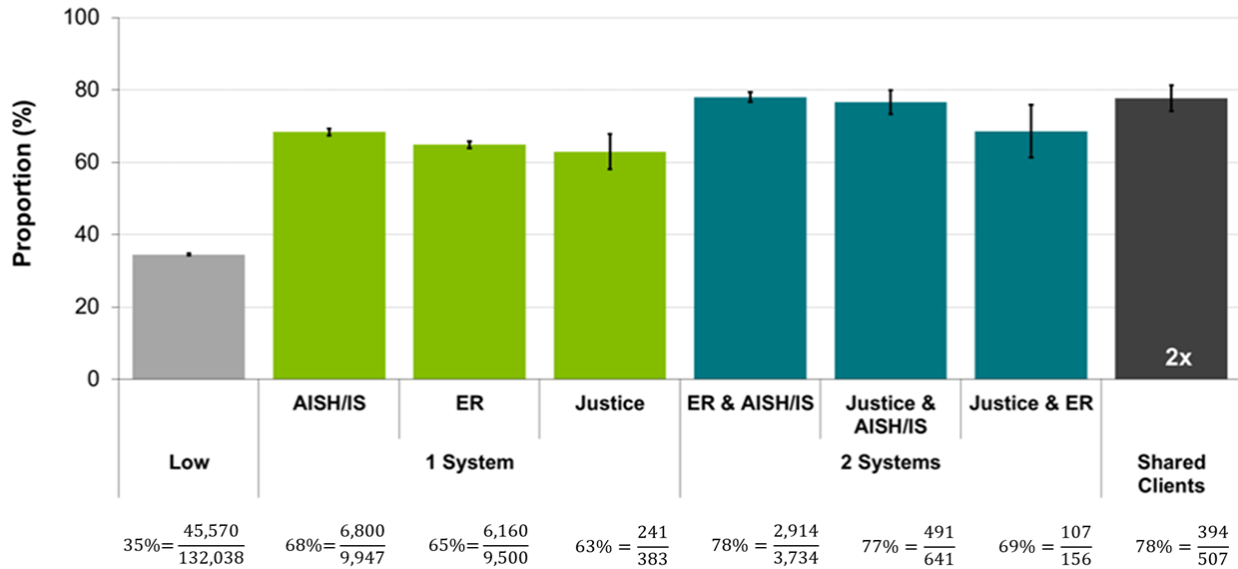


Figure 3. Proportion of young women (18 to 25 years) with a pregnancy diagnostic code between 2005/06 and 2009/10

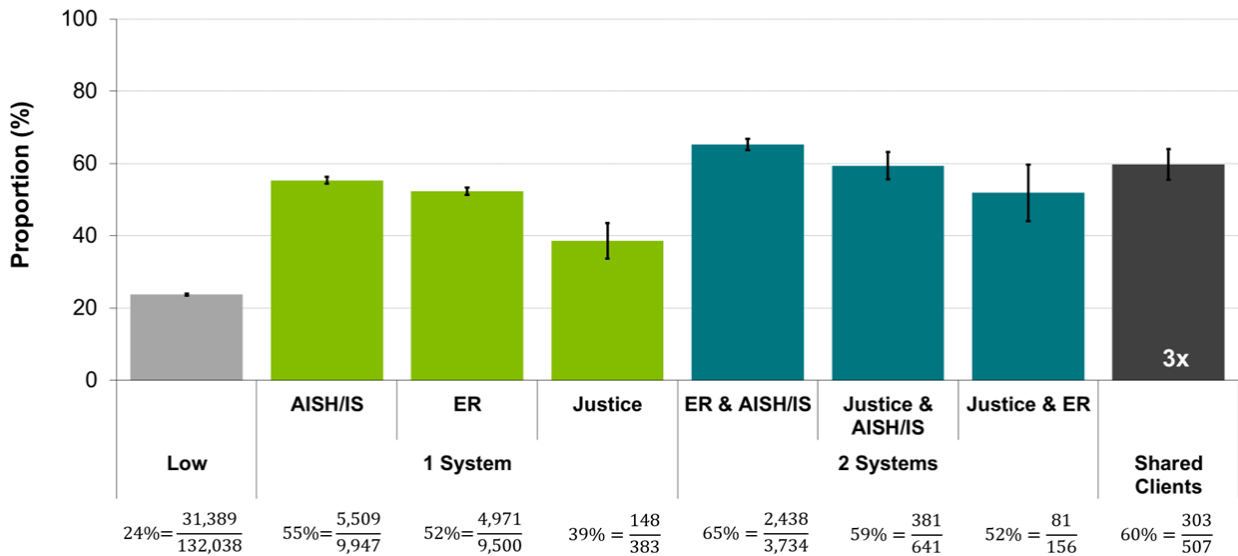


Figure 4. Proportion of young women (18 to 25 years) with a delivery diagnostic code between 2005/06 and 2009/10

## Substance Use and Alcohol Dependence

Shared clients were statistically significantly more likely to have indicators of increased substance use<sup>e</sup> than individuals who were low users of systems, or high users of just one or two systems.

- 80% of shared clients received a diagnostic code for substance use from a physician at a hospital, ER, outpatient clinic or at a physician office visit (Figure 5), a rate 11 times higher than individuals who are low users of systems, and significantly higher than high users of one or two systems.
- 55% of shared clients received an alcohol dependence diagnostic code from a physician (Figure 6), a rate 26 times higher than individuals who are not low users of systems, and significantly higher than users of one or two systems.

These are likely underestimates as there would be many youth who use substances or have alcohol dependence that do not come to the attention of the medical system or who do not receive a diagnostic code for it.

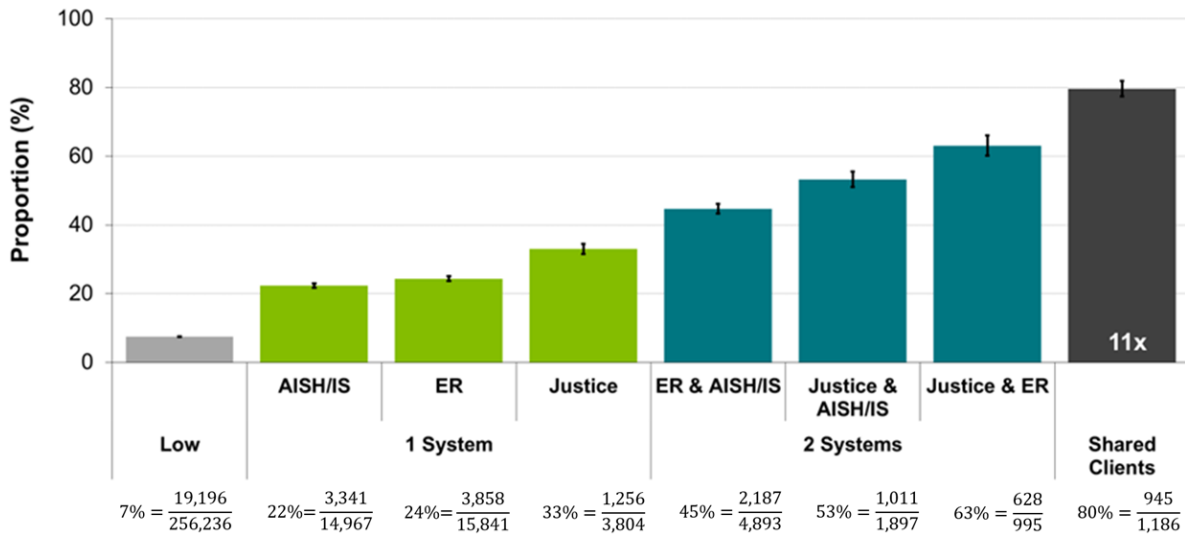


Figure 5. Proportion of young adults (18 to 25 years) with a substance use diagnostic code between 2005/06 and 2009/10

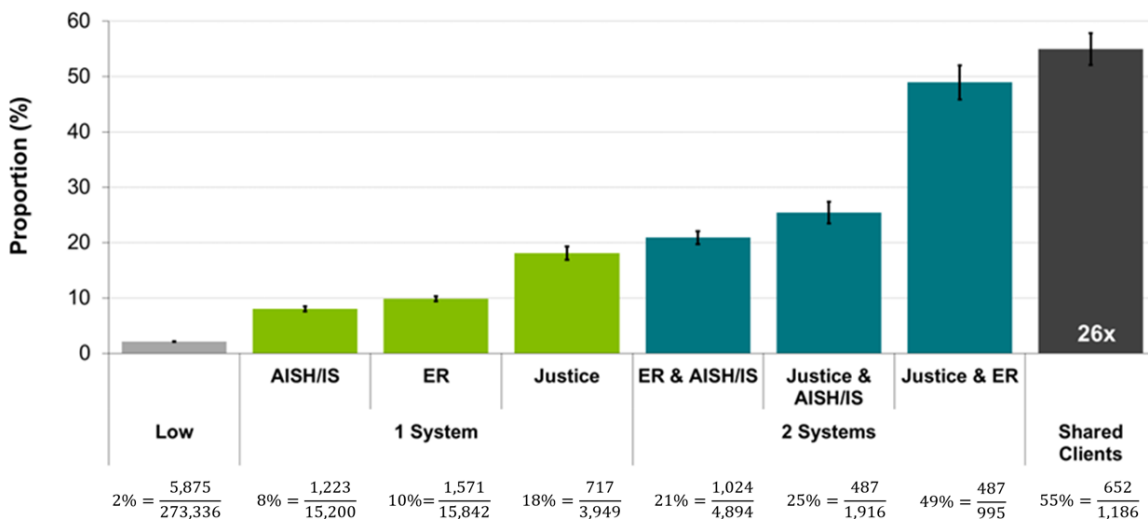


Figure 6. Proportion of young adults (18 to 25 years) with an alcohol use diagnostic code between 2005/06 and 2009/10

<sup>e</sup> Note: Substance use, alcohol dependence, homelessness, and physical and mental health were derived from health administrative data. They indicate what diagnoses the physician gave or suspected in a particular medical encounter. While receiving a diagnostic code for a particular condition suggests that the individual may have that condition, it is not guaranteed. Please see the data notes in Appendix A for additional discussion about the strengths and limitations of the variables derived from the health administrative data.



## SOCIAL CIRCUMSTANCES

### *Residential Mobility and Homelessness*

Shared clients were statistically significantly more likely to have indicators of increased challenges in their social circumstances than individuals who were low users of the systems. For instance, **shared clients were more likely to be residentially instable and to have an indicator of visible homelessness.**<sup>f</sup>

- The average number of changes of residence reported to the Alberta Health Care Insurance Plan between 2005/06 and 2009/10 was 3.2 (95% CI: 3.0-3.4) for shared clients, as compared to 1.1 (95% CI: 1.1-1.1) for low users of the systems (Table 4, page 8). This is statistically significantly different.
- High users of the ER & AISH/IS, and high users of Justice & AISH/IS had the second highest average number of residential moves at 2.9 (95% CI: 2.8-3.0) and 2.8 (95% CI: 2.7-2.9), respectively. Recipients of AISH/IS only had an average of 2.3 moves (95% CI 2.3-2.3).
- 9% of shared clients received a visible homeless diagnostic code at some point during the first five years of the study (Figure 8, page 8; Table 5, page 8). This is more than 4 times higher than users of two systems (2%), many times higher than users of one system (<1%), and approximately 1000 times higher than low users of the systems (0.01%). This is likely an underestimate as many youth could be experiencing homelessness and not come to the attention of the medical system or receive a diagnostic code for homelessness. Please see Appendix A for more details.
- Out of the 384 young adults who were given a visible homeless diagnostic code, 67% were a high user of at least two systems (259/384), and 28% were shared clients. Only 24/273,336 low users of systems received a homeless diagnostic code. These are statistically significant results.

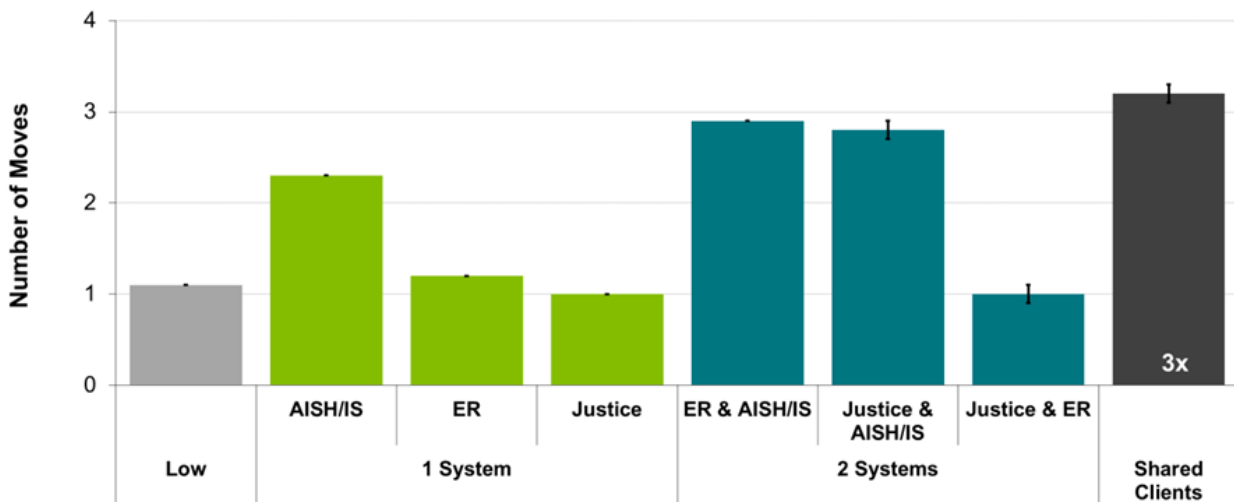


Figure 7. Average number of residential moves between 2005/06 and 2009/10 by young adults (18 to 25 years)

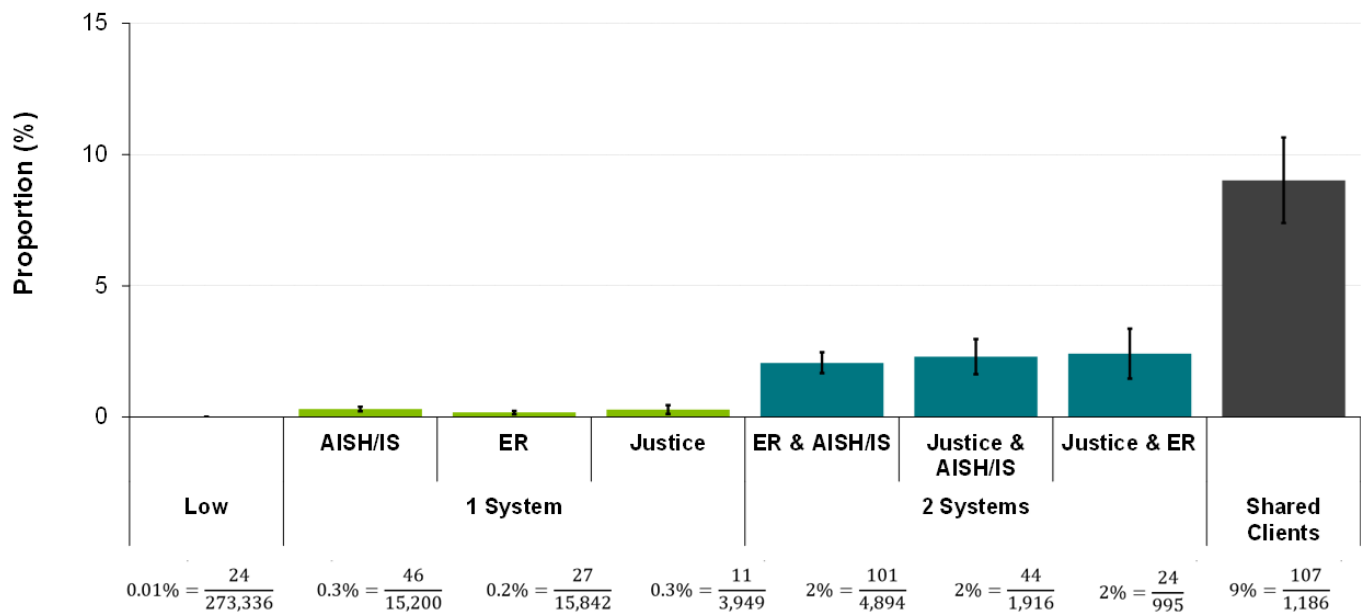
<sup>f</sup> Health administrative data includes a code for homelessness that physicians can use to describe the social situation of their patients. While the homelessness code appears to be mostly capturing visibly homeless individuals presenting with medical conditions stereotypically associated with homelessness such as mental health conditions and substance use, this variable was important to consider by our ministry partners. Please see Appendix A for additional information on the strengths and limitations of this variable.

**Table 4. Average number of residential moves between 2005/06 and 2009/10 by young adults (18 to 25 years)**

High User of	Sub-population	Average Number of Moves	95% Confidence Interval
0 Systems	Low	1.1	1.1-1.1
1 System	AISH/IS	2.3	2.3-2.3
	ER	1.2	1.2-1.3
	Justice	1.0	1.0-1.1
2 Systems	ER & AISH/IS	2.9	2.8-3.0
	Justice & AISH/IS	2.8	2.7-2.9
	Justice & ER	1.0	0.9-1.1
3 Systems	Shared Clients	3.2	3.0-3.4

**Table 5. N (%) of young adults (18 to 25 years) with a homeless diagnostic code between 2005/06 and 2009/10**

High User of	Sub-Population	N Homeless	Population	% Homeless
0 Systems	None	24	273,336	0.01%
1 System	AISH/IS	46	15,200	0.3%
	ER	27	15,842	0.2%
	Justice	11	3,949	0.3%
2 Systems	ER & AISH/IS	101	4,894	2.1%
	Justice & AISH/IS	44	1,916	2.3%
	Justice & ER	24	995	2.4%
3 Systems	Shared Clients	107	1,186	9%
	Grand Total	384	317,318	



**Figure 8. Proportion of young adults (18 to 25 years) with a homeless diagnostic code between 2005/06 and 2009/10**





## Education

Of the 21,281 individuals for whom we have education records, the proportion that completed high school varied significantly by the number of systems with which they were involved. In general, the more systems someone was involved in, the less likely they were to have completed high school.

- With the exception of high users of the ER only, high users of any system had high school completion rates below 30%. Shared clients and high users of Justice & AISH/IS had the lowest high school completion rates (19% and 17%, respectively) (Figure 9).
- Low users of systems had a high school completion rate of 75%; this is almost four times higher than shared clients.

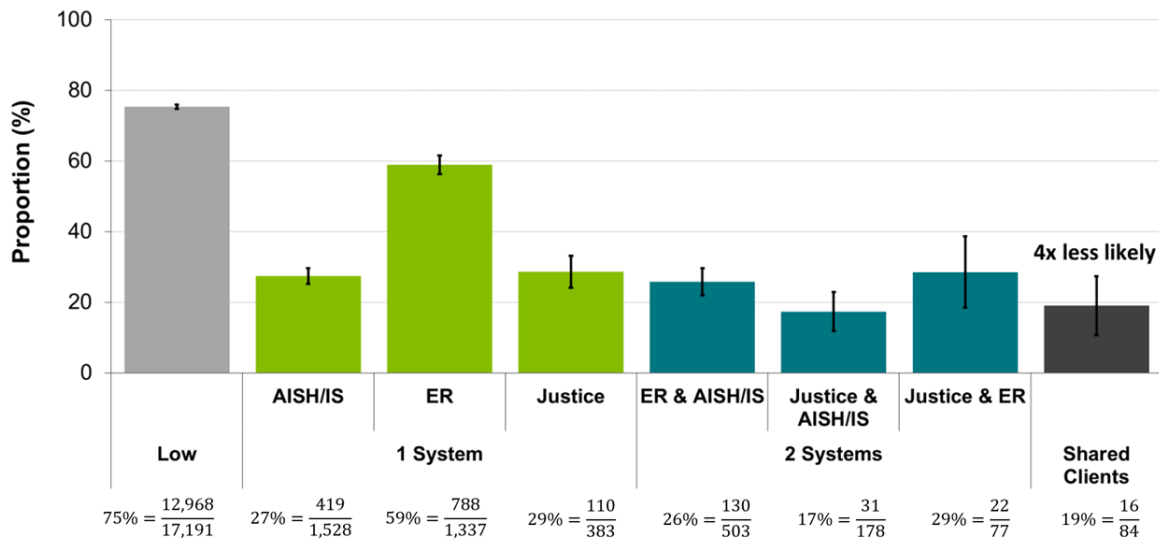


Figure 9. Proportion of young adults (18 to 25 years) who had a record for high school completion between 2005/06 and 2009/10

## Corrections

The more systems that an individual was involved in, the more likely they had been in the provincial correctional system. While individuals that were high users of the justice system were most likely to have been in the provincial correctional system, any high system use was associated with a higher rate of involvement in the correctional system (Figure 10).

- 29% of high users of only the justice system were in the provincial correctional system as compared to 37% of high users of Justice & the ER, 49% of high users of Justice & AISH/IS, and 51% of shared clients.

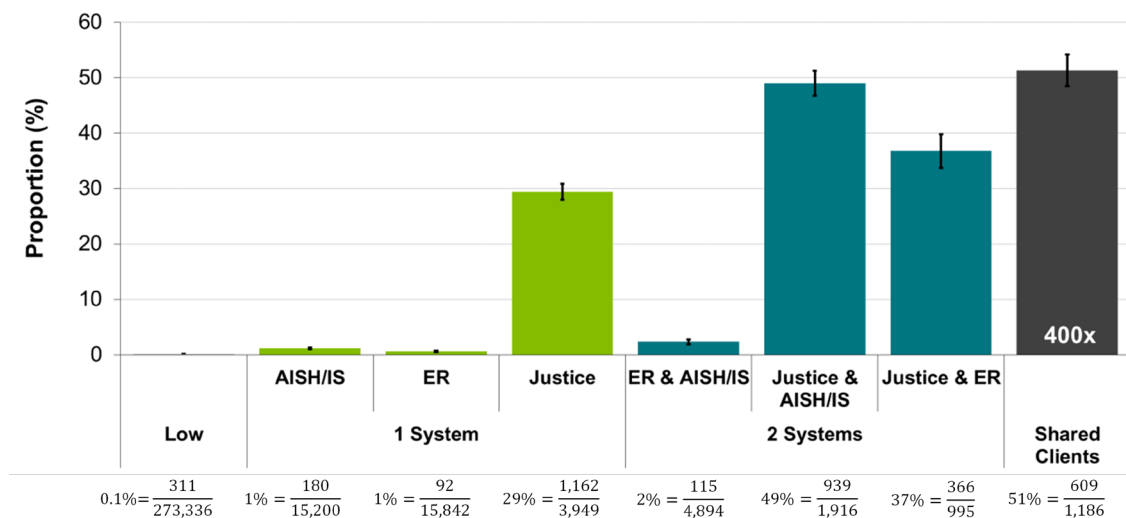


Figure 10. Proportion of young adults (18 to 25 years) in provincial correctional system between 2005/06 and 2009/10

## MENTAL HEALTH DIAGNOSTIC CODES

**The more systems an individual was involved in, the more likely they were to have received a diagnostic code for a mental health condition. Shared clients had the the highest likelihood of receiving a mental health diagnostic code between 2005/06 to 2010/11.<sup>8</sup>**

- 13% of shared clients received a diagnostic code for schizophrenia, a rate 45 times higher than low users of systems (Figure 11, page 11).
- 26% of shared clients received a personality disorder diagnostic code, as compared to 16% of high users of the ER & AISH/IS, 7% of recipients of AISH/IS only, and 1% of low users of systems (Figure 12, page 11).
- Similar patterns were seen for ADD/ADHD (Figure 13, page 12), bipolar disorder (Figure 14, page 12), adjustment disorder (Figure 15, page 13), and conduct disorder (Figure 16, page 13).

While in all of the other mental health conditions the rate was highest in shared clients, the patterns for anxiety and depression were slightly different.

- 48% of high users of the ER & AISH/IS received an anxiety diagnostic code, as compared to 46% of shared clients, and 33% of high users of the ER (Figure 17, page 14). 16% of low users of the systems received an anxiety diagnostic code.
- 62% of high users of the ER & AISH/IS received a depression diagnostic code, as compared to 60% of shared clients, and 45% of high users of AISH/IS (Figure 18, page 14). 21% of low users of the systems received a depression diagnostic code.

The pattern in self-harm was especially striking.

- 34% of shared clients received a diagnostic code for self-harm by a physician at least once between 2005/06 and 2009/10 (Figure 19, page 15).
- The proportion who received a self-harm code in high users of two systems ranged from 12% (Justice & AISH/IS) to 20% (Justice & ER).
- The proportion in high users of one system ranged from 5% (AISH/IS only) to ER only (7%),
- 1% of low system users received a diagnostic code for self-harm.
- Shared clients were 27 times more likely to receive a self-harm diagnostic code than low-users of the systems.

This is likely an underestimate as many youth may be experiencing mental health concerns or have harmed themselves and either not sought medical attention or not received those diagnostic codes.

---

<sup>8</sup> While receiving a diagnostic code for a particular mental health condition suggests that the individual may have that condition, it is not guaranteed, as individuals can receive various potential diagnoses until the true condition is determined. Please see the data notes in Appendix A for additional discussion on the strengths and limitations of health administrative data as indicators of mental health conditions.



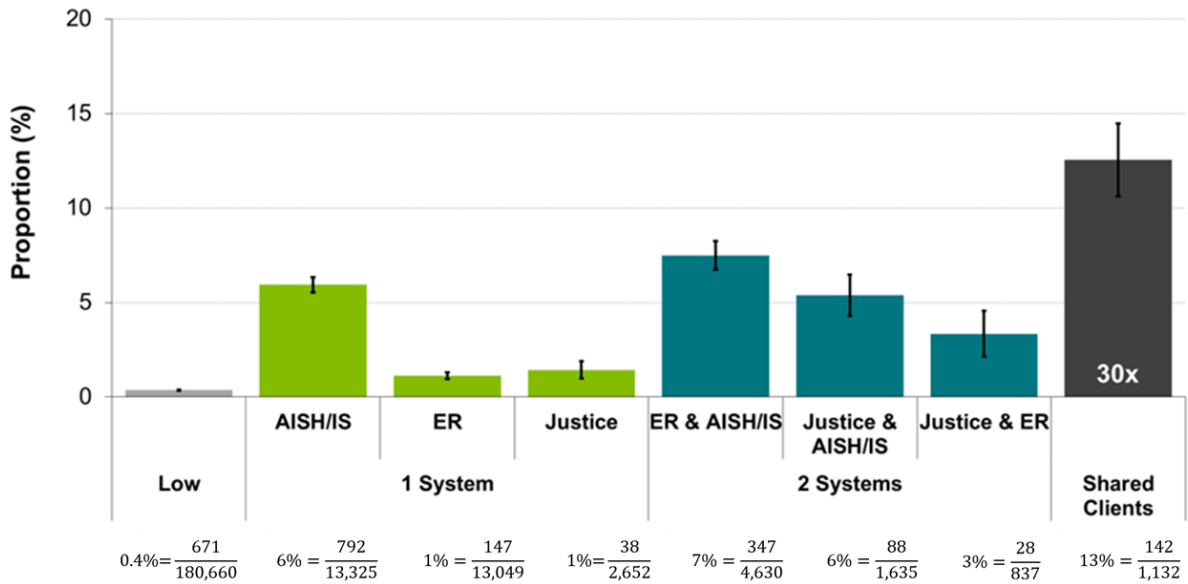


Figure 11. Proportion of young adults (18 to 25 years) who received a diagnostic code for schizophrenia between 2005/06 and 2009/10

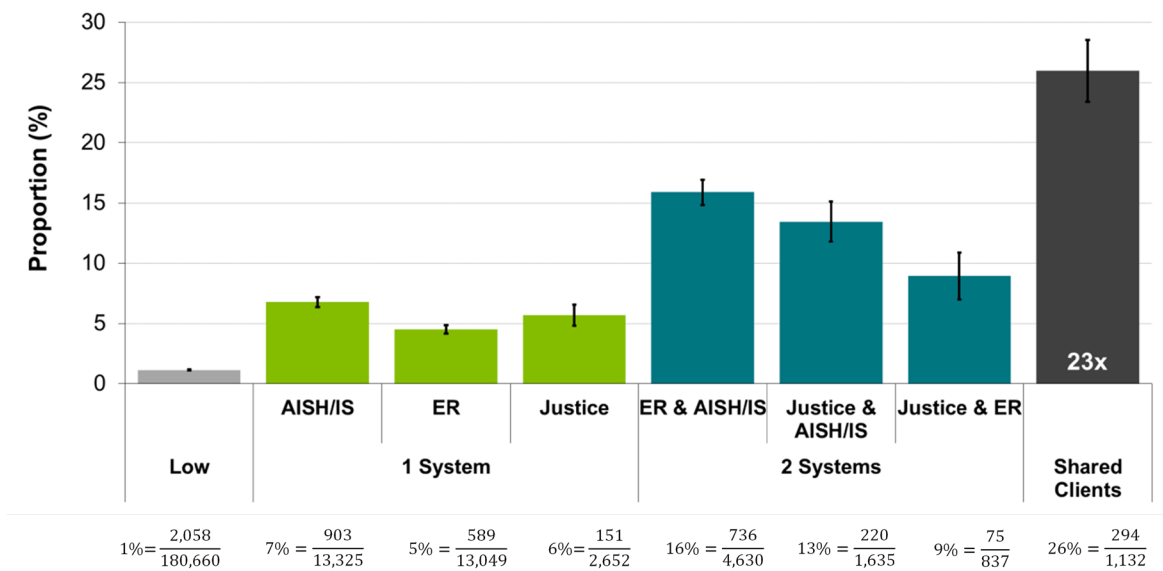


Figure 12. Proportion of young adults (18 to 25 years) who received a diagnostic code for personality disorder between 2005/06 and 2009/10

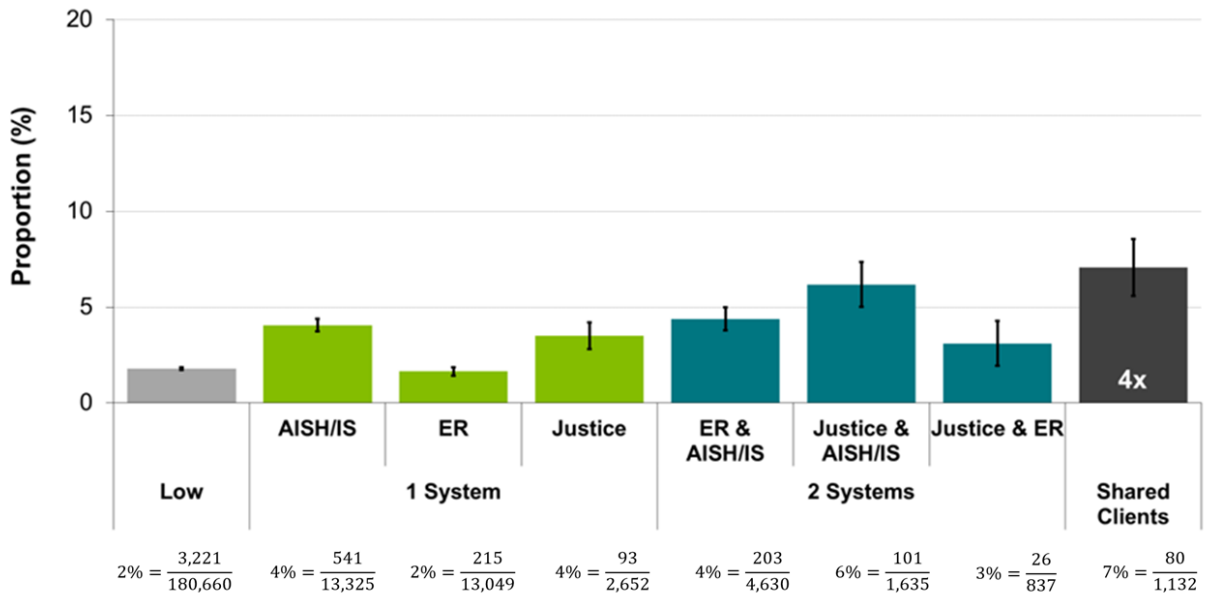


Figure 13. Proportion of young adults (18 to 25 years) who received a diagnostic code for attention deficit disorder (ADD) or attention deficit hyperactivity disorder (ADHD) between 2005/06 and 2009/10

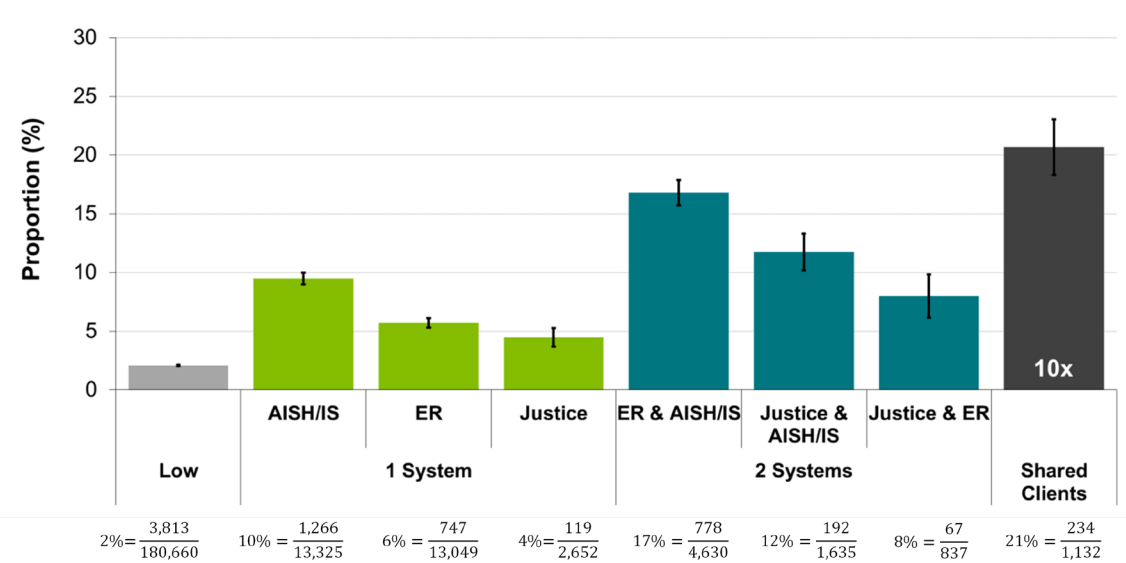


Figure 14. Proportion of young adults (18 to 25 years) who received a diagnostic code for bipolar disorder between 2005/06 and 2009/10



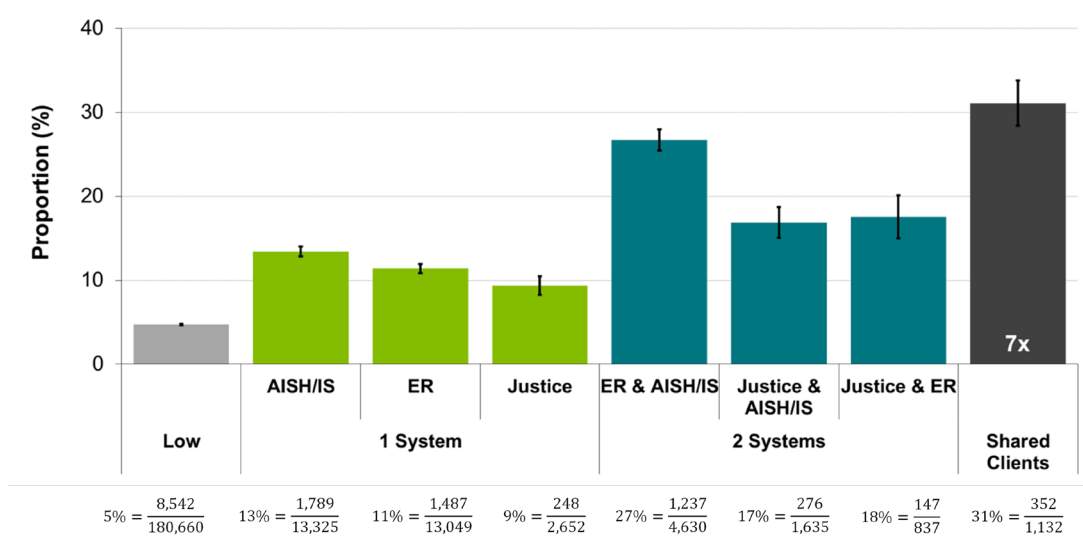


Figure 15. Proportion of young adults (18 to 25 years) who received a diagnostic code for adjustment disorder between 2005/06 and 2009/10

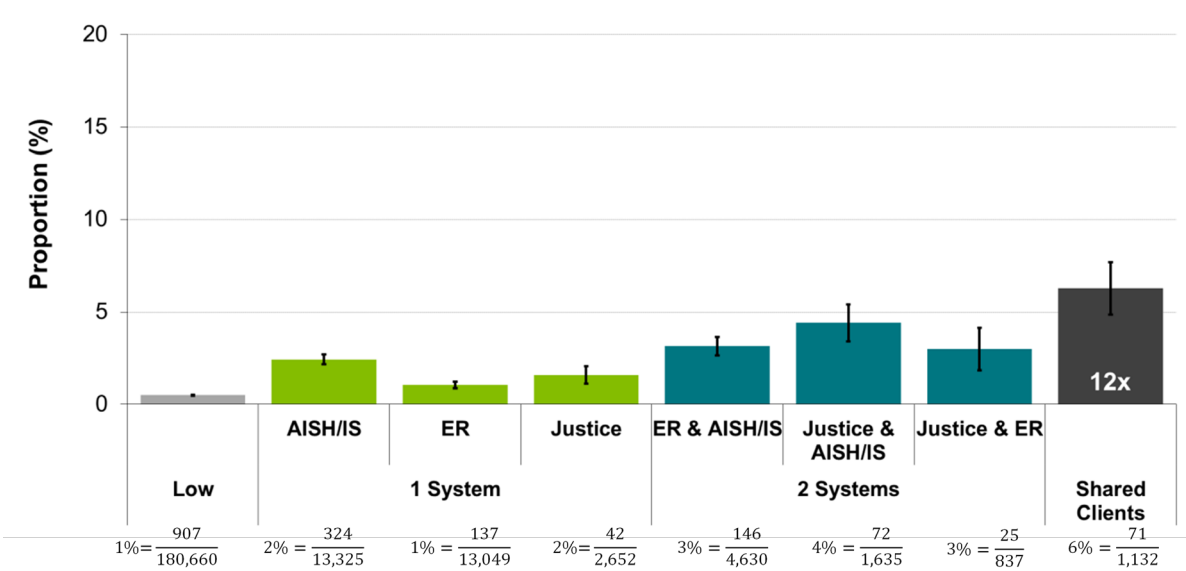


Figure 16. Proportion of young adults (18 to 25 years) who received a diagnostic code for conduct disorder between 2005/06 and 2009/10

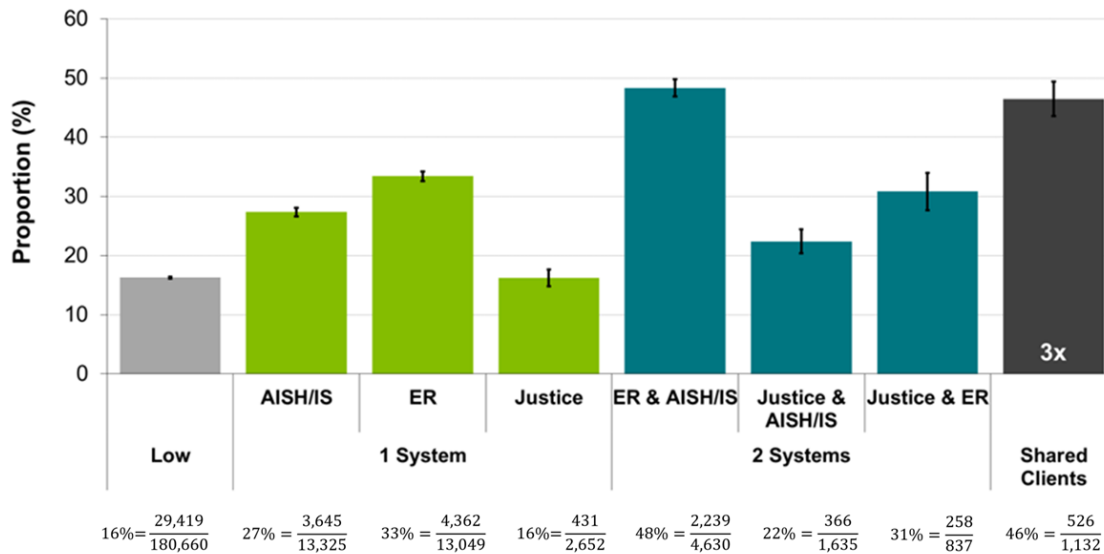


Figure 17. Proportion of young adults (18 to 25 years) who received a diagnostic code for anxiety disorder between 2005/06 and 2009/10

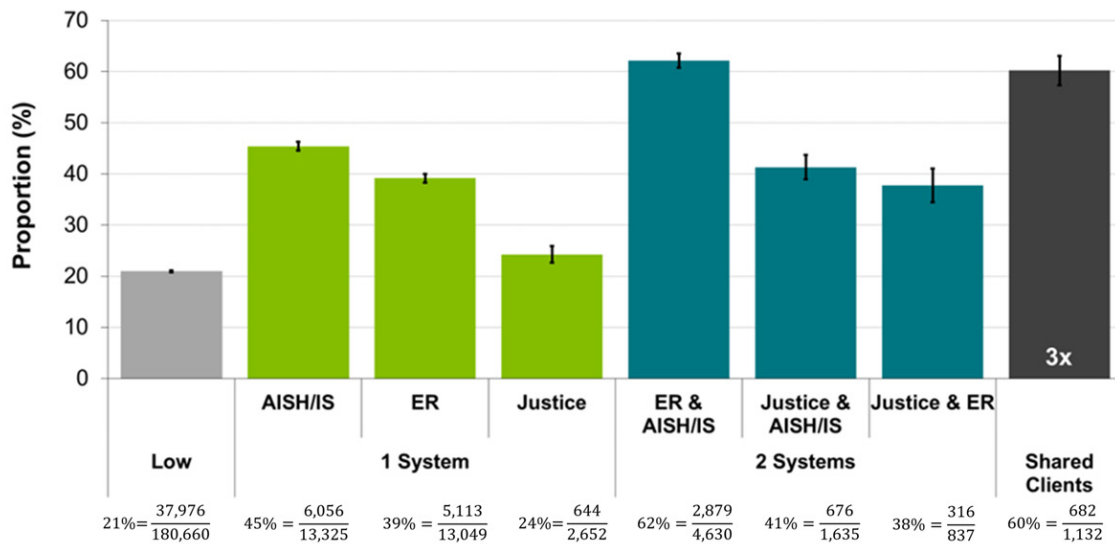


Figure 18. Proportion of young adults (18 to 25 years) who received a diagnostic code for depression between 2005/06 and 2009/10



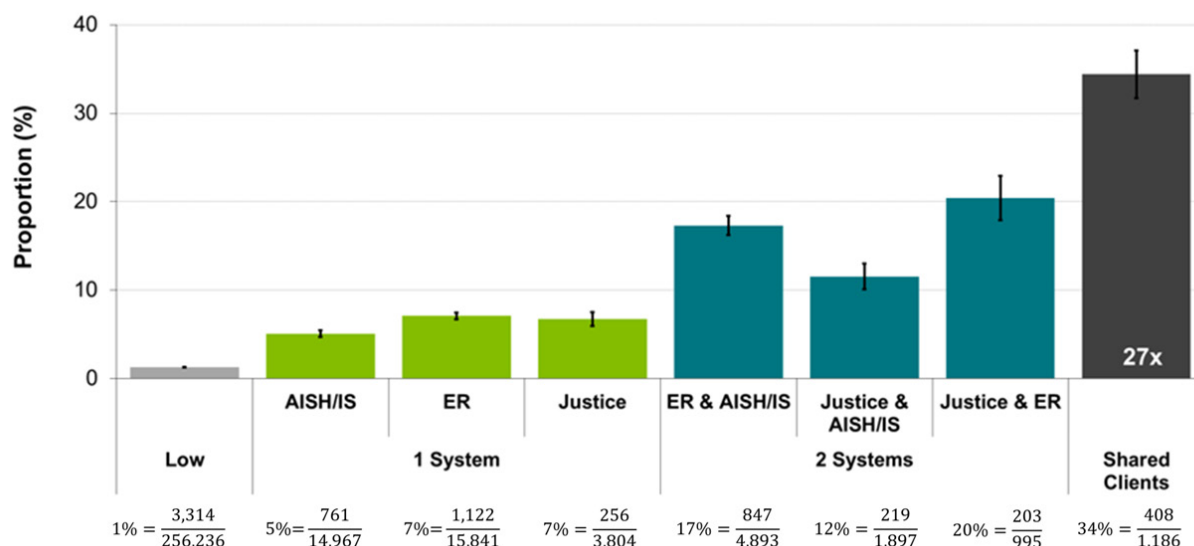


Figure 19. Proportion of young adults (18 to 25 years) with a self-harm diagnostic code between 2005/06 and 2009/10

## PHYSICAL HEALTH DIAGNOSTIC CODES

Health administrative data were also used to describe the physical health of shared clients and compare it to high users of 0, 1 and 2 systems. A pattern similar to that seen with mental health diagnostic codes and social characteristics was found in physical health.

**The more systems one was a high user of, the more likely they had experienced negative physical health outcomes<sup>h</sup> between 2005/06 to 2009/10.**

- 10% of shared clients had a diagnostic code indicating abuse such as physical, sexual or psychological abuse, torture, neglect, mental cruelty, and sexual assault. This is 50 times higher than the rate found in low systems users (0.2%) (Figure 24, page 18). Note that this is likely a severe underestimate of the true number of individuals who have experienced abuse, as (a) victims may not seek medical attention or disclose the abuse to physicians and (b) the data only go back to 2005/06.
- 3% of shared clients and 2% of high users of the ER & Justice had diagnostic codes indicating frostbite, hypothermia and other effects of reduced temperature, as compared to 0.2% of low systems users (Figure 25, page 18). This is a statistically significant difference.
- 94% of shared clients and 96% of high users of the ER & Justice received a physical trauma diagnostic code that required them to seek medical attention in an emergency room or hospital. Physical traumas include unintentional falls, assaults, intentional self-harm, car accidents, stabbings, burns, and suffocation. This is almost three times as high when compared to low system users (36%) (Figure 20, page 16).

Similar patterns are seen when focusing on sub-categories of physical traumas:

- 14% of shared clients and 13% of high users of the ER & Justice received a diagnostic code for a traumatic brain injury<sup>l</sup> in an emergency room or hospital. This is 10 times higher than low users of the systems (Figure 21, page 16).
- 65% of shared clients and 64% of high users of the ER & Justice received a diagnostic code for an assault due to, for example, bodily force, gun, blunt object, or sexual assault (Figure 22, page 17).
- 4% of shared clients and 3% of high users of the ER & AISH/IS have received a sexual assault diagnostic code (this analysis includes both males and females) (Figure 23, page 17). This is 35 times higher than low systems users (0.1%).

<sup>h</sup> Please see Appendix A for the case definitions used in this section.

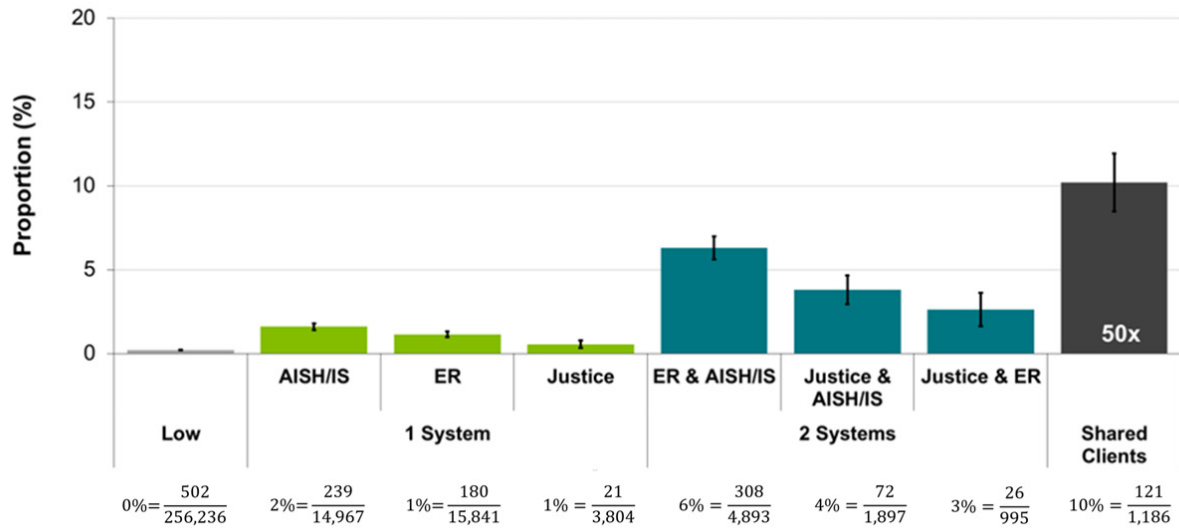


Figure 20. Proportion of young adults (18 to 25 years) with a diagnostic code for abuse between 2005/06 and 2009/10

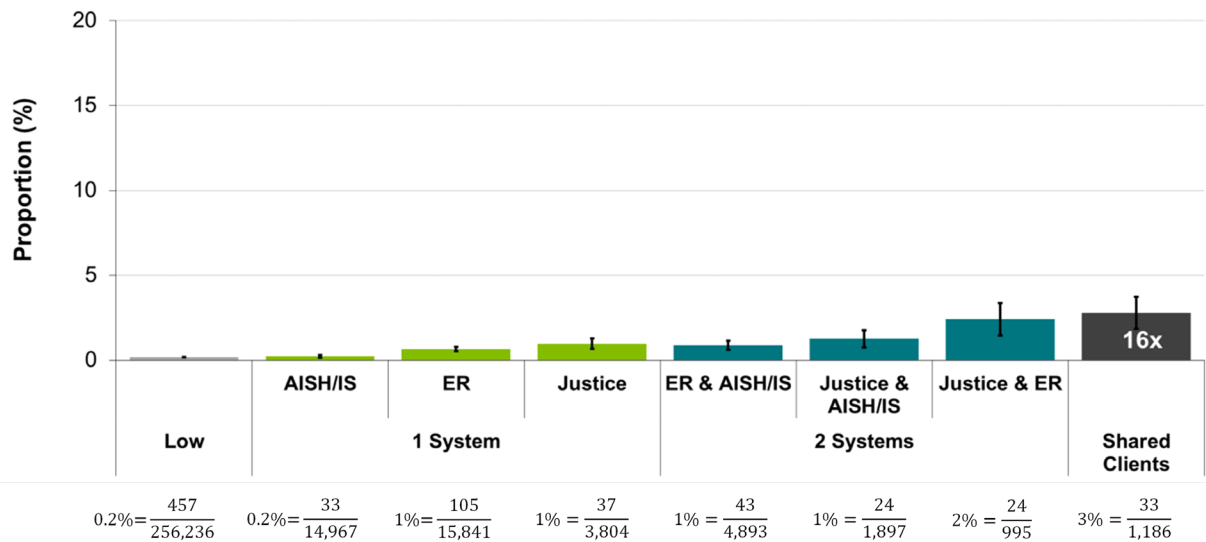


Figure 21. Proportion of young adults (18 to 25 years) with a diagnostic code for frost-bite or hypothermia between 2005/06 and 2009/10





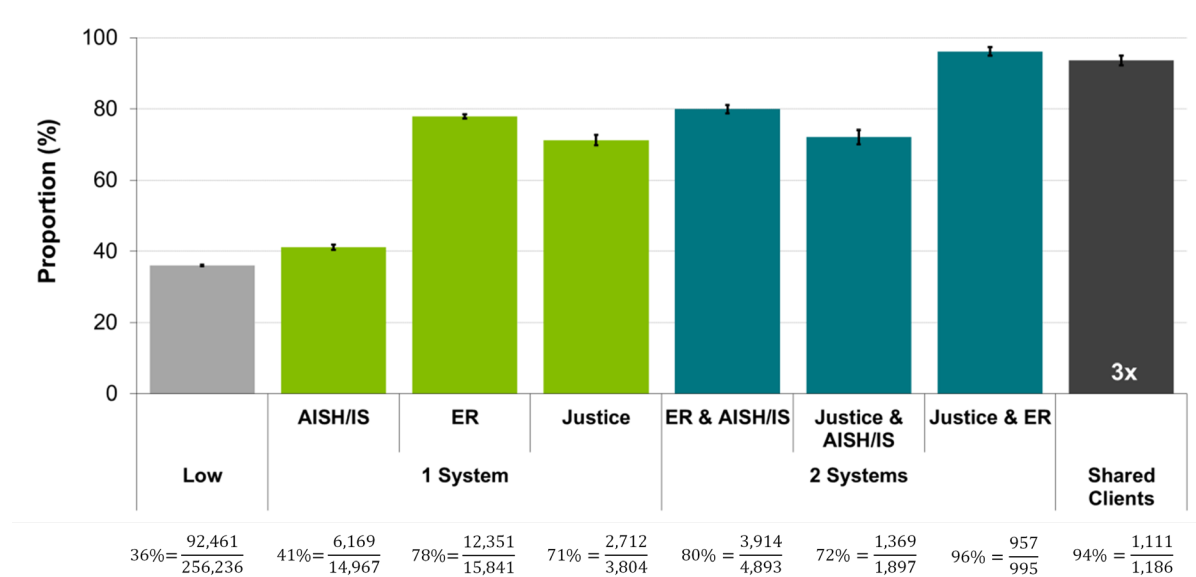


Figure 22. Proportion of young adults (18 to 25 years) with a diagnostic code for physical trauma between 2005/06 and 2009/10

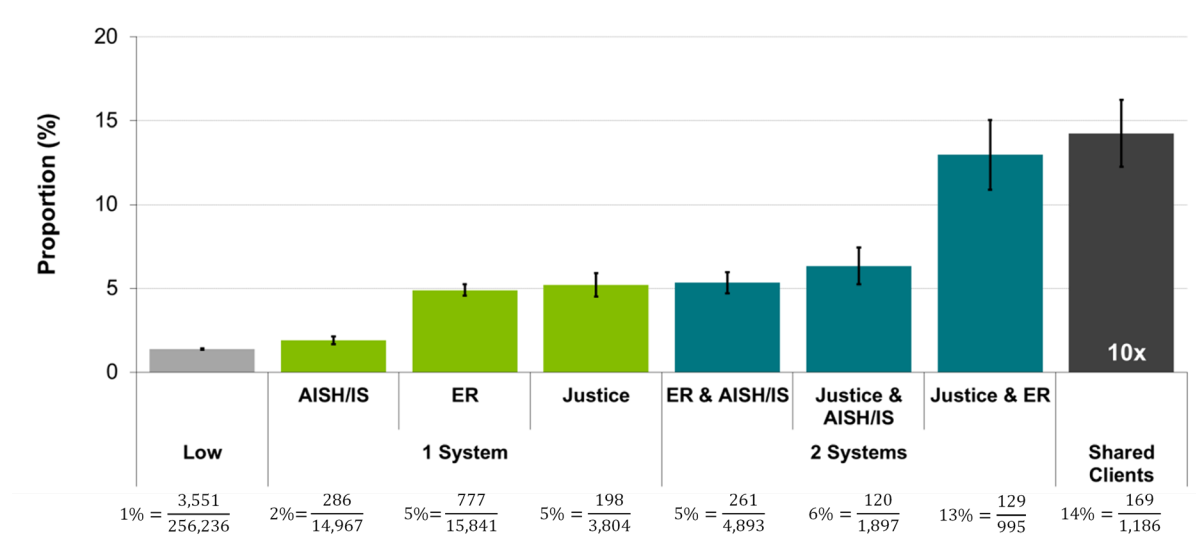


Figure 23. Proportion of young adults (18 to 25 years) with a diagnostic code for traumatic brain injury between 2005/06 and 2009/10

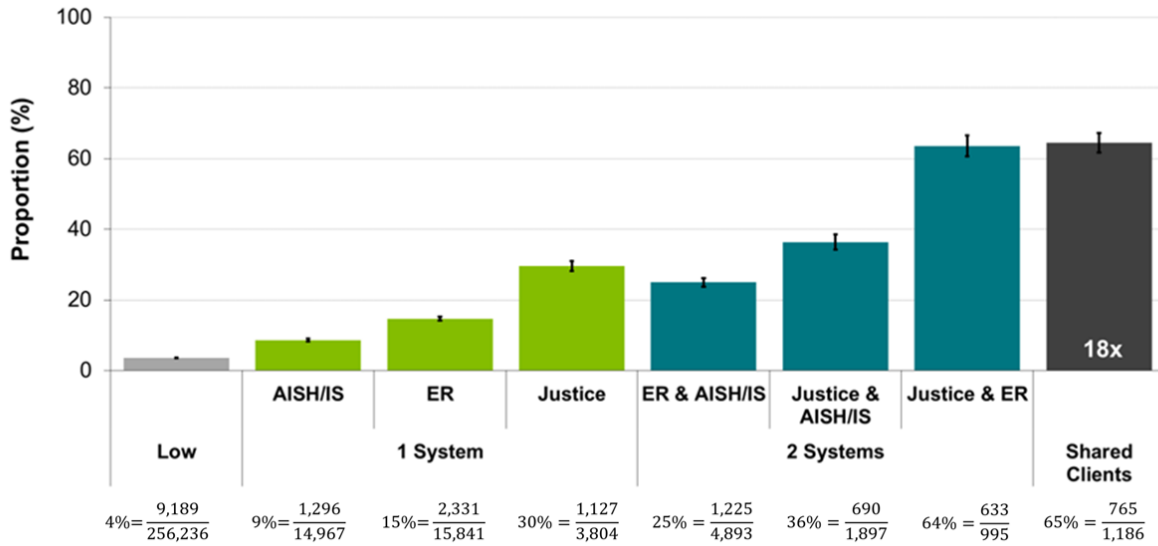


Figure 24. Proportion of young adults (18 to 25 years) with a diagnostic code for assault between 2005/06 and 2009/10

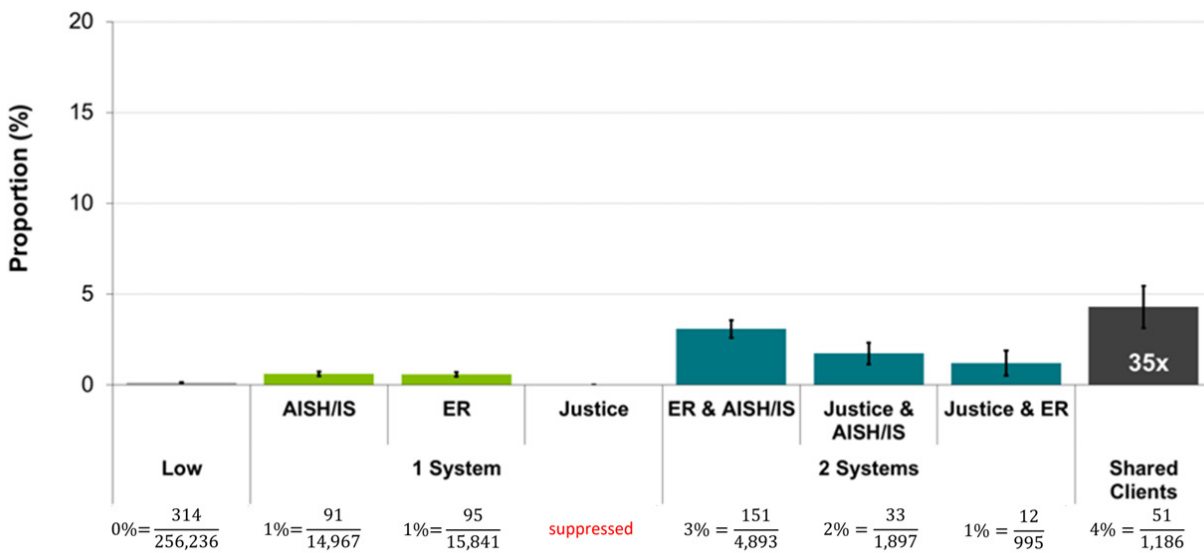


Figure 25. Proportion of young adults (18 to 25 years) with a diagnostic code for sexual assault between 2005/06 and 2009/10



The previous sections described the social, mental health, and physical health characteristics of individuals who are considered high users of 0, 1, 2 and 3 systems (shared clients). Shared clients generally had more complicating characteristics (e.g., physical trauma, abuse, mental health conditions, substance use, etc.) and a large proportion were female (43%), the majority of which had given birth to at least one child in the first five years of the study. The prevalence of these complicating characteristics usually acted as a gradient, with the prevalence of health and social risk factors increasing with the number of systems an individual was a high user in. This gradient pattern suggests that increased integration of services could assist many more young adults than the 1,186 shared clients in this report. In the following section, we followed these individuals through time to determine their outcomes in the following fiscal year, for which data were available 2010/11.

## MOVING FORWARD IN TIME (2010/11)

In this section we followed high users of 0, 1, 2 and 3 systems (shared clients) through time to determine their outcomes in the following fiscal year, 2010/11.

**Individuals who were shared clients in the first 5 years of the study period were generally more likely to have negative outcomes** than high users of one or two systems, however, like in previous section, the risk generally increased with the number of systems one was a high user of.

- 49% of shared clients reoffended in 2010/11. This group was most likely to reoffend out of all of the high users of the Justice system, including high users of Justice & AISH/IS (42%), Justice & ER (41%), and high users of Justice only (27%) (Figure 26). Note: all high users of Justice are considered prolific offenders with 5+ charges between 2005/06 - 2009/10
- Shared clients visited the emergency room, on average, 4.8 times (95% CI: 4.4-5.2) in 2010/11, almost three times higher than low users of systems (1.7, 95% CI: 1.7-1.7). High users of the ER only had, on average a rate of 3.3 visits (95% CI: 3.2-3.4) in 2010/11 (Figure 27, page 20).
- Any individuals on AISH/IS in the first five years of the study were much more likely to receive supports from Income Support in 2010/11 (Figure 28, page 21), however there was a clear gradient, with users of only the AISH/IS system less likely to receive Income Support than users of AISH/IS and users of the ER & another system. While 32% of users of AISH/IS received Income Support in 2010/11, 40% of high users of the ER & AISH/IS, 44% of high users of Justice & AISH/IS, and 46% of shared clients received Income Support in 2010/11.

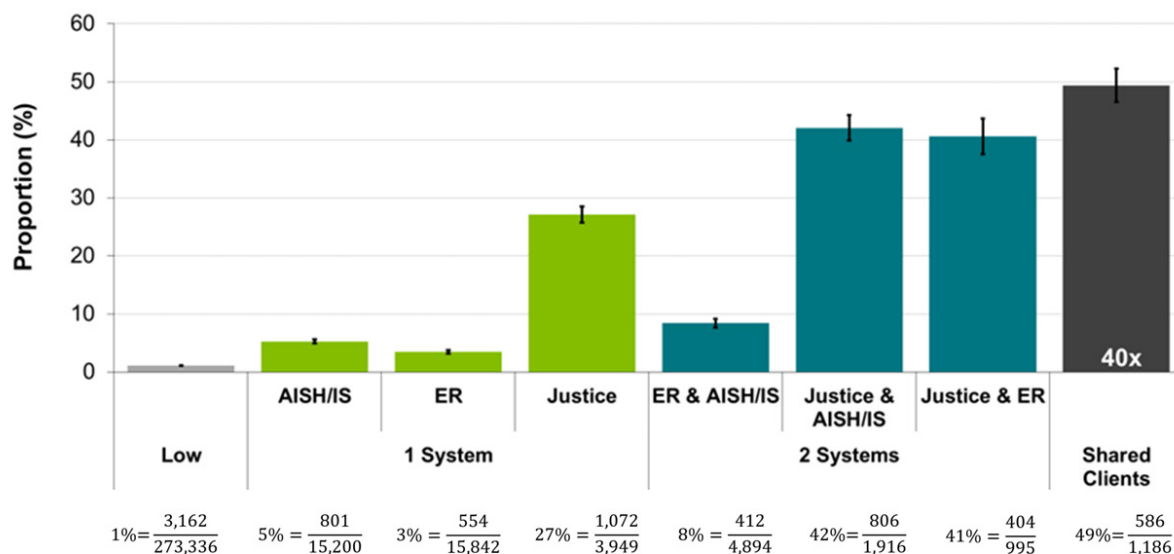
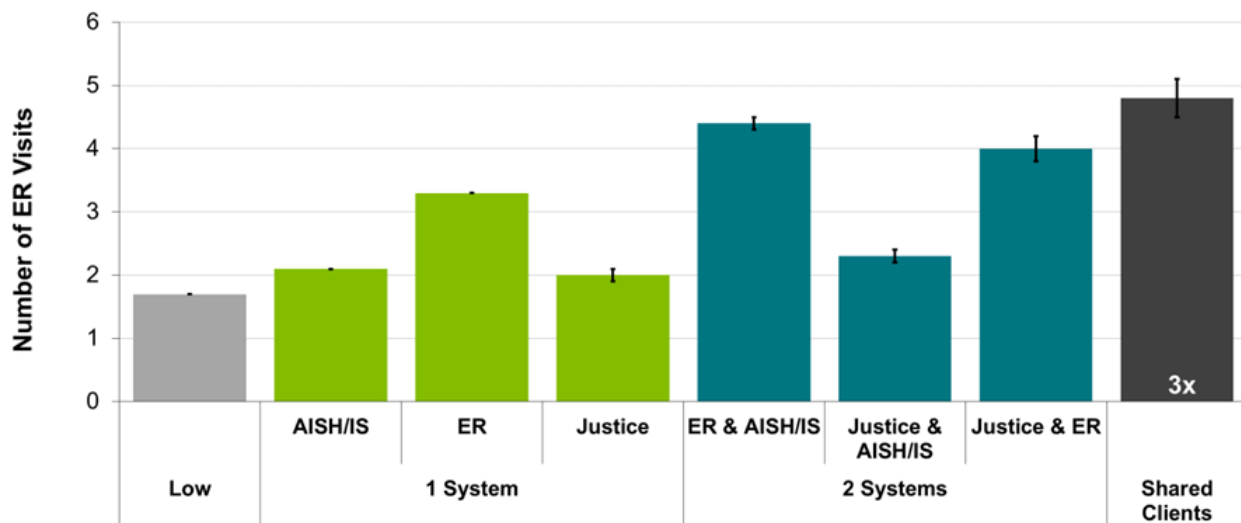


Figure 26. Proportion of young adults (18 to 25 years) charged with at least one crime in 2010/11

**Table 6. Average number of ER Visits**

High User of	Sub-population	Average Number of ER Visits	95% Confidence Interval
0 Systems	Low	1.7	1.7-1.7
1 System	AISH/IS	2.1	2.0-2.1
	ER	3.3	3.2-3.4
	Justice	2.0	1.9-2.1
2 Systems	ER & AISH/IS	4.4	4.3-4.6
	Justice & AISH/IS	2.3	2.1-2.4
	Justice & ER	4.0	3.6-4.3
3 Systems	Shared Clients	4.8	4.4-5.2



**Figure 27. Average number of ER visits in 2010/11 by young adults (18 to 25 years)**

***Substance Use and Alcohol Dependence in 2010/11***

The more systems an individual was involved in, the more likely they were to have a substance use or alcohol dependence diagnostic code in 2010/11.

- 37% of shared clients received a substance use diagnostic code in 2010/11 (Figure 29, page 21). This is substantially higher than high users of two systems (17%, 21% and 25%, respectively), high users of one system (9%, 7% and 10%, respectively) and 17 times higher than low users of systems (2%).
- A similar pattern was seen for alcohol dependence (Figure 30, page 22) and homelessness (Figure 31, page 22).

This is likely an underestimate as many youth may use substances or have alcohol dependence and not seek medical attention.



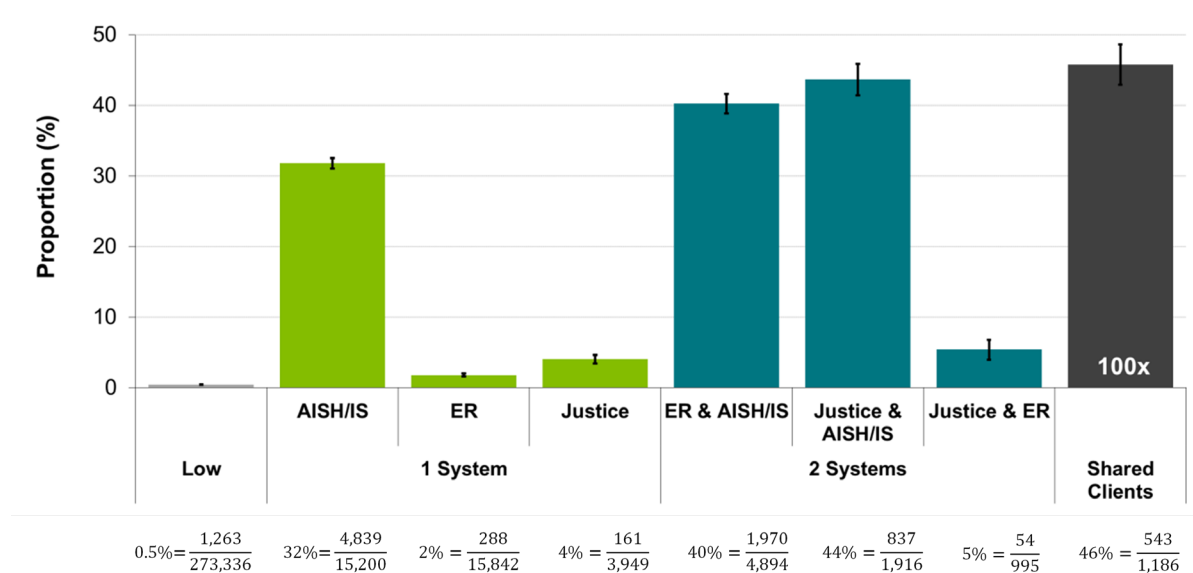


Figure 28. Proportion of young adults (18 to 25 years) who received Income Support in 2010/11

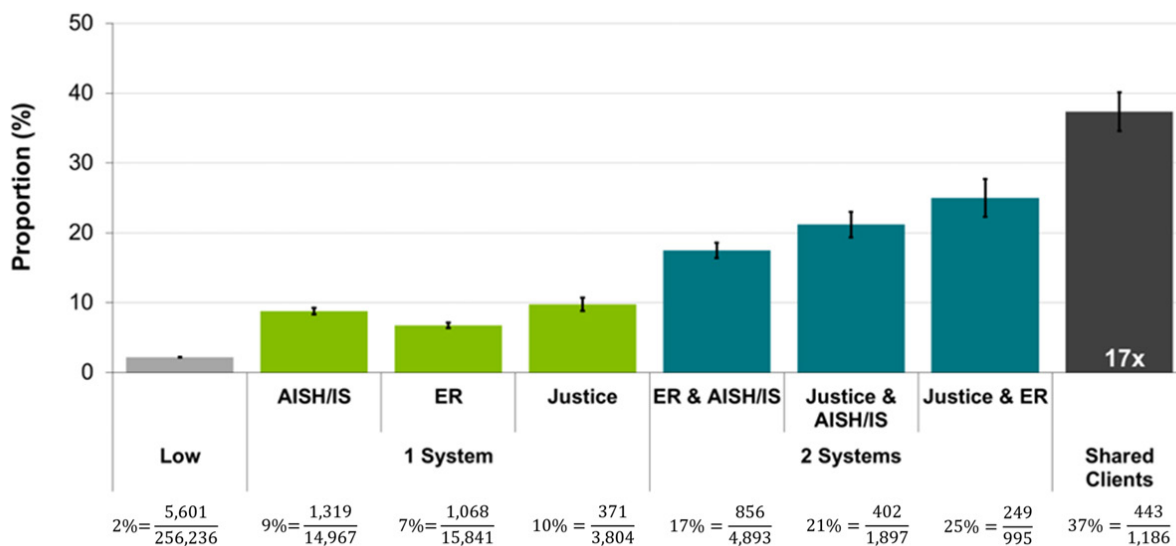


Figure 29. Proportion of young adults (18 to 25 years) who received a substance use diagnostic code in 2010/11

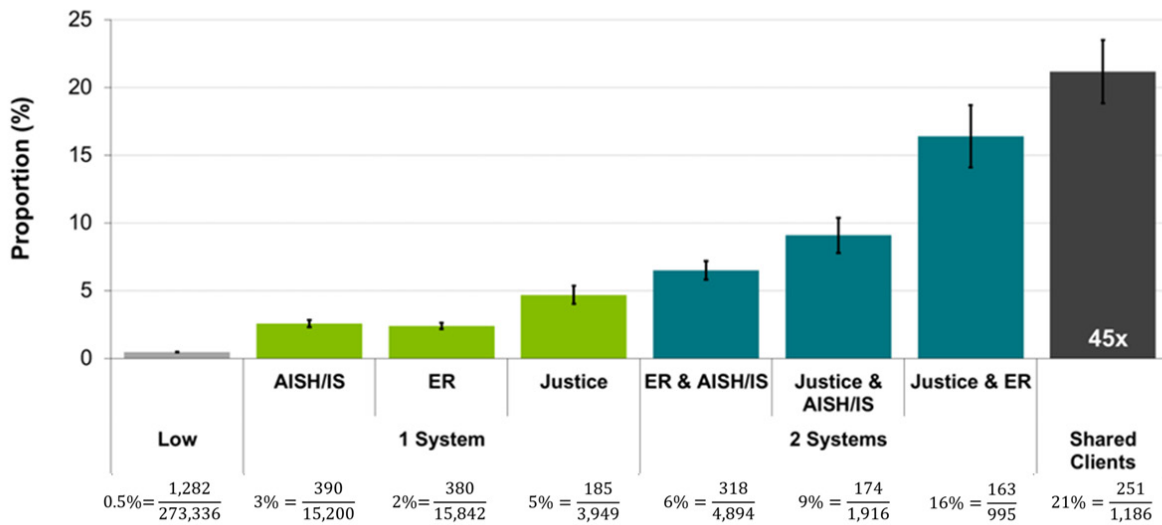


Figure 30. Proportion of young adults (18 to 25 years) who received an alcohol dependence diagnostic code in 2010/11

### Visible Homelessness in 2010/11

The more systems an individual was involved in, the more likely they were to have a diagnostic code for visible homelessness in 2010/11.

- 3% of shared clients received visible homelessness diagnostic code in 2010/11 (Figure 31). This is statistically significantly higher than high users of 0, 1 or 2 systems (Figure 31). This is an underestimate of the true rate of homelessness in these populations. Please see Appendix A for additional details.

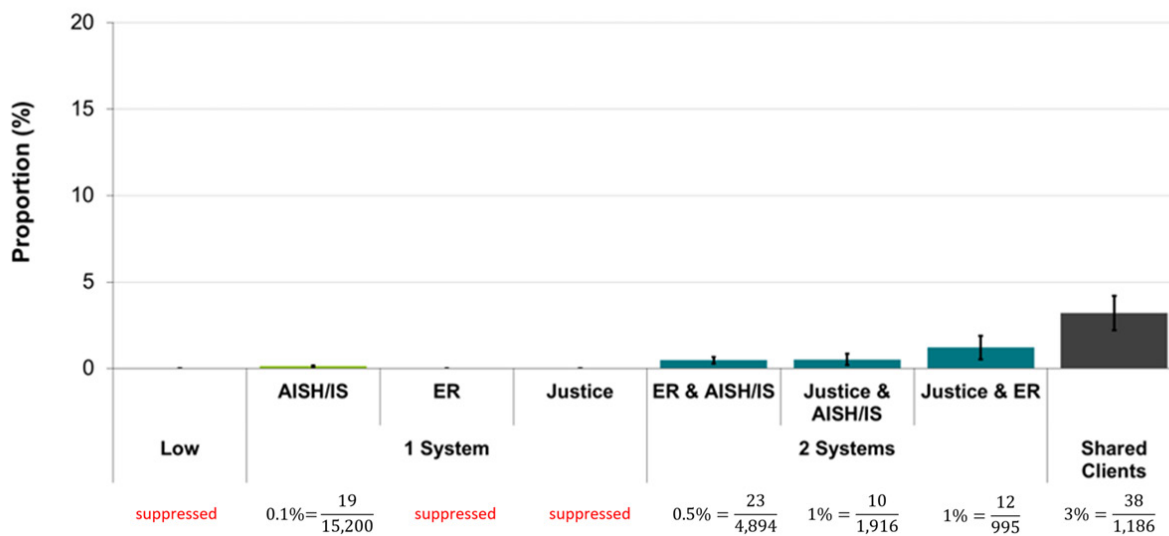


Figure 31. Proportion of young adults (18 to 25 years) who received a homelessness diagnostic code in 2010/11



**Physical Health Diagnostic Codes in 2010/11**

The more systems an individual was involved in in the first 5 years of the study, the more likely they were to receive a diagnostic code for a negative physical health outcome in 2010/11.

- 8% of shared clients received a diagnostic code for self-harm in 2010/11, significantly higher than high users of two systems (4%, 3%, and 5%, respectively) and high users of one system (1%, 1%, and 1%, respectively), and 40 times higher than low users of systems (0.2%) (Figure 32). This is likely an underestimate as many youth may harm themselves and either not receive medical attention or not admit that they harmed themselves to a physician.
- 41% of shared clients and 45% of users of the ER and Justice system received a diagnostic code for a physical trauma (Figure 33).
- While high users of the justice system were more likely to receive medical attention as the victim of an assault in 2010/11, those most at risk were those involved in multiple systems; 17% of shared clients and 16% of high users of ERs and Justice received a diagnostic code as a victim of an assault (Figure 34, page 24).

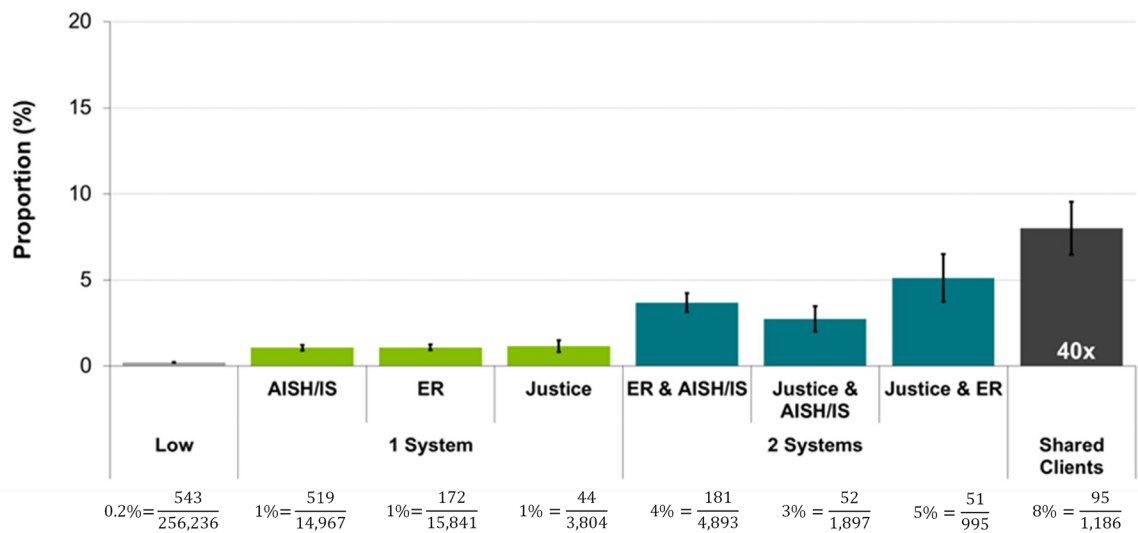


Figure 32. Proportion of young adults (18 to 25 years) who received a self-harm diagnostic code in 2010/11

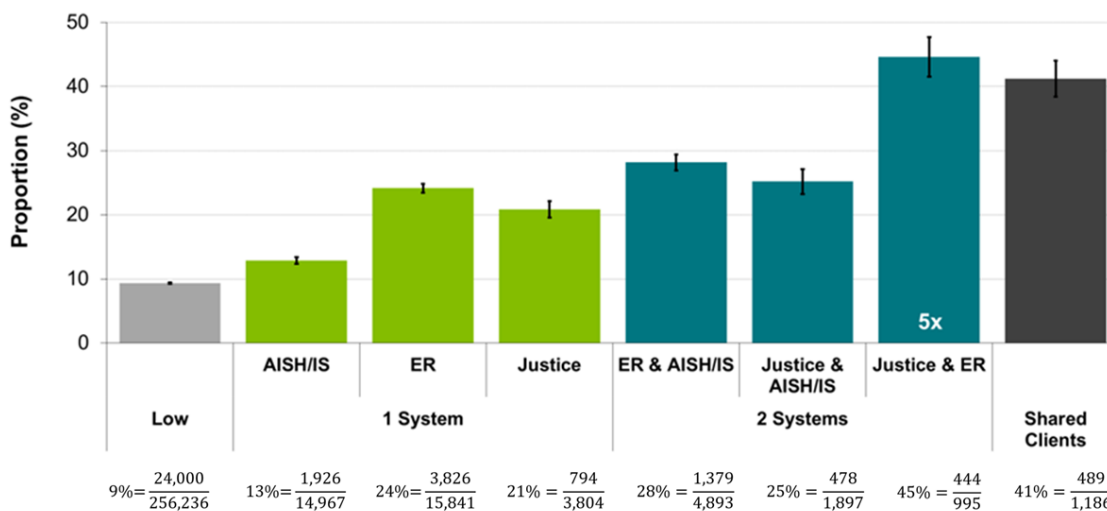


Figure 33. Proportion of young adults (18 to 25 years) who received a physical trauma diagnostic code in 2010/11

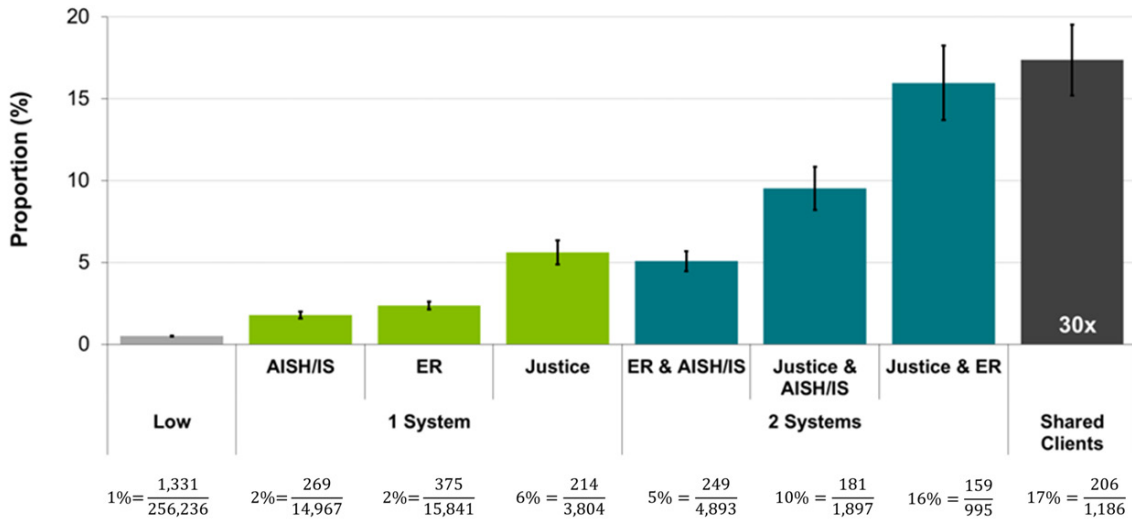


Figure 34. Proportion of young adults (18 to 25 years) who received an assault diagnostic code in 2010/11

### Pregnancy and Live Births

Women that were high users of multiple systems in the first five years of the study were twice as likely to become pregnant and give birth in 2010/11, as compared to women who were low users of systems.

- 35% of female shared clients received a pregnancy diagnostic code, twice as high as female low users of systems (18%) (Figure 35).
- 19% of female shared clients received a diagnostic code for a live birth, twice as high as female low users of systems (9%) (Figure 36, page 25).
- This suggests that women who are high users of multiple systems may be parenting or have children in the care of others, such as family members or the foster care system. They may benefit from reproductive services and family-friendly policies.

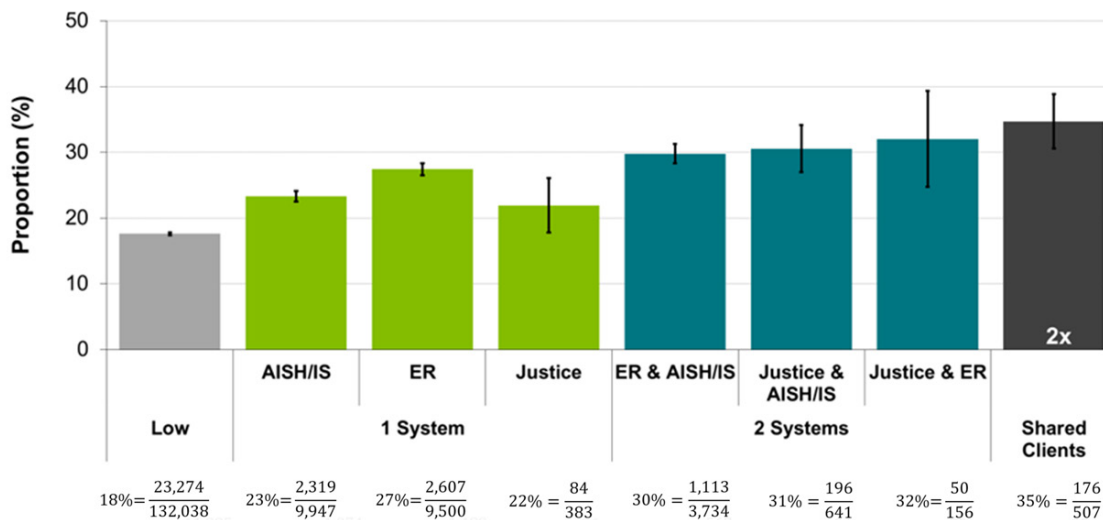


Figure 35. Proportion of young women (18 to 25 years) who received a pregnancy diagnostic code in 2010/11





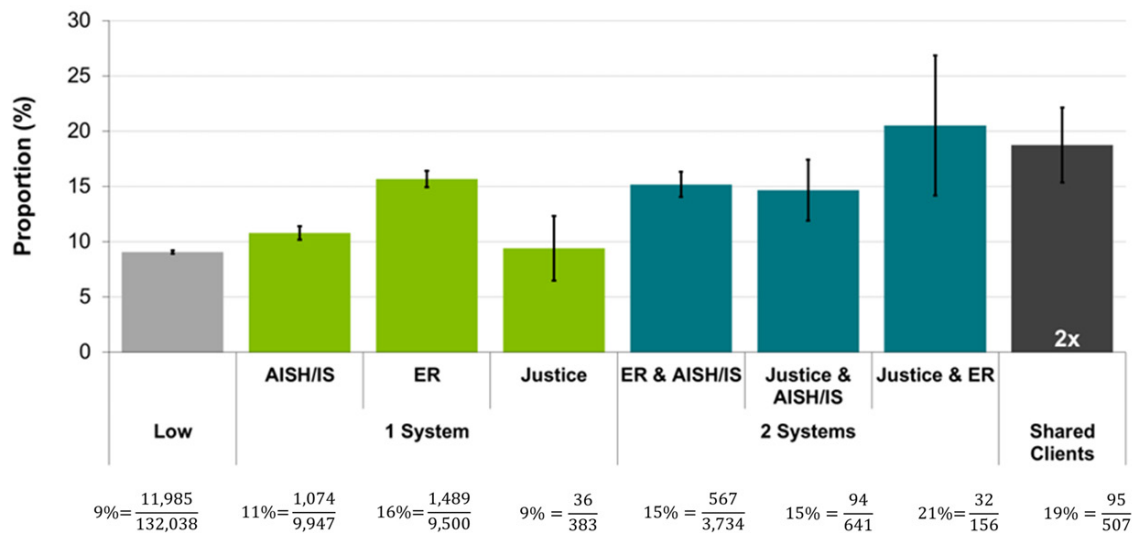


Figure 36. Proportion of young women (18 to 25 years) who received diagnostic code for a live birth in 2010/11

## CONCLUSIONS AND IMPLICATIONS

This study found that high users of multiple systems generally had more complicating characteristics and were more likely to have negative outcomes over time. Shared clients (recipients of AISH or Income Support who were in the top 10% of emergency room users, and were considered prolific offenders in the justice system) generally had the most complicating characteristics and the worst outcomes, followed by high users of two systems, followed by high users of one system, with low users of systems having the best outcomes and the least complicating characteristics. Shared clients were most likely to receive diagnostic codes for mental health conditions and self-harm, physical traumas such as traumatic brain injuries and assaults, frostbite, homelessness, substance use, and alcohol dependence. They were also most likely to have been part of the provincial correctional system and least likely to have completed high school.

Shared clients were also more likely to have negative health and social outcomes in the following year. In 2010/11, shared clients were more likely to reoffend, receive Income Support, be higher-than-average users of emergency rooms, and to have received diagnostic codes for substance use, alcohol dependence, self-harm, physical trauma, and assault. This suggests that individuals who are high users of multiple systems are more likely to be high users in the future.

The sex distribution of clients is of interest. While females make up a small proportion of high users of the justice system, they make up 43% of shared clients. High users of multiple systems were twice as likely to have been pregnant and twice as likely to have given birth at least once, suggesting that they may be parenting or have children in the foster care system. Shared clients were also twice as likely to become pregnant in 2010/11 and twice as likely to give birth, suggesting that there may be an ongoing need for family-friendly policies, reproductive health services, and supports for parenting.

These findings suggest that a coordinated and collaborative approach to policy and programming between ministries and service providers may be beneficial to improve outcomes for shared clients and other high users of multiple systems. Shared clients may especially benefit from integrative programs across justice, addictions treatment, housing, the foster care system, and health and social supports to address the inter-dependent medical, psychiatric, housing, parental, social and legal issues.

## REFERENCES

1. Somers, J.M., Rezanoff, S.N., Moniruzzaman, A., & Zabaraukas, C. (2015). High-frequency use of corrections, health, and social services, and association with mental illness and substance use. *Emerging Themes in Epidemiology*, 12(1), 1-10.
2. Boobis S. (2016). *Year one evaluation report: Understanding multiple complex needs in Newcastle and Gateshead*. England. Retrieved from <https://www.trhs.org/app/uploads/2016/05/Understanding-Multiple-and-Complex-Needs-in-Newcastle-and-Gateshead.pdf>
3. Department of Health and Human Services. (2017). *Service provision framework: Multiple and complex needs initiative December 2017*. Victoria, Australia. Retrieved from <https://www.dhhs.vic.gov.au/publications/multiple-and-complex-needs-initiative-macni-service-provision-framework>
4. Rosengard, A., Laing, I., Ridley, J., & Hunter, S. (2007). *A literature review on multiple and complex needs: Lessons for policy and practice*. Edinburgh, Scotland. Scottish Executive Social Research. Retrieved from <https://www.webarchive.org.uk/wayback/archive/20170116111102/http://www.gov.scot/Publications/2007/01/18133343/3>
5. Canadian Institute for Health Information. (2006). *Head injuries in Canada: A decade of change (1995-1995 to 2003-2004)*. Ottawa, Ontario. Canadian Institute for Health Information and Statistics Canada. Retrieved from [https://secure.cihi.ca/free\\_products/ntr\\_head\\_injuries\\_2006\\_e.pdf](https://secure.cihi.ca/free_products/ntr_head_injuries_2006_e.pdf)
6. Injury Prevention Centre. (2017). *Traumatic Brain Injuries in Alberta, Hospital Admissions (2005-2014)/ Emergency Department Visits (2011-2014)*. Edmonton, Alberta. Retrieved from [https://injurypreventioncentre.ca/downloads/reports/IPC\\_Concussion\\_TBI\\_Report\\_2018.pdf](https://injurypreventioncentre.ca/downloads/reports/IPC_Concussion_TBI_Report_2018.pdf)
7. Cory, J., Hankivsky, O., Ruebsaat, G., & Dechief, L. (2003). *Reasonable doubt: The use of health records in legal cases of violence against women in relationships*. Vancouver, British Columbia. British Columbia Centre of Excellence for Women's Health. Retrieved from <http://bccewh.bc.ca/2014/02/reasonable-doubt-the-use-of-health-records-in-legal-cases-of-violence-against-women-in-relationships/>



## APPENDIX A: DATA NOTES

This study used linked administrative data from the Child and Youth Data Lab (CYDL) Longitudinal Project, which combines data from six different ministries (Health, Community and Social Services, Children Services, Education, Advanced Education, and Justice and Solicitor General) between the 2005/06 to 2010/11 fiscal years. Only individuals age 25 years and under in the 2005/06 fiscal year were included in the dataset. Data from Alberta Health included the Alberta Health Care Insurance Plan registry as well as datasets that are submitted to Alberta Health with details on every hospital inpatient discharge, emergency room visits, outpatient clinic visit and physician office visit (physician claims). The hospital, emergency room and outpatient clinic data utilized here is what is ultimately included in CIHI's Discharge Abstract Database and National Ambulatory Care Reporting System.

For this analysis, individuals were included if they were between the ages of 18 and 25 years in the 2005/06 fiscal year and registered in the Alberta Health Care Insurance Plan (AHCIP) during the entire study period (2005/06 to 2010/11). The AHCIP covers all residents of Alberta with the exception of refugees and individuals who may be living in Alberta but are residents of another province or country, such as university students. The AHCIP contains the vast majority of children and youth living in Alberta.

A cross-sectional analysis was utilized to describe the needs of shared clients that are high users of multiple systems, including health, justice, and community and social services for the first five years of the study (2005/06 – 2009/10). Individuals were then followed forward through time to describe their health and social outcomes in the 2010/11 fiscal year. All variables were derived from the CYDL administrative data.

### High Justice Users - Prolific Offenders

For these analyses high justice users were defined as prolific offenders. Prolific offenders were defined as individuals with 5 or more offences between 2005/06 and 2009/10. This definition is consistent with that of the Justice and Solicitor General's criteria for entry in the Priority Prolific Offender Program, and is the same as the definition of medium and high level offending in the report entitled "Health, Mental Health and Social Service Use in High-Level Offenders Age 18 to 25 in Alberta". This report can be downloaded at <https://policywise.com/data/p2/>

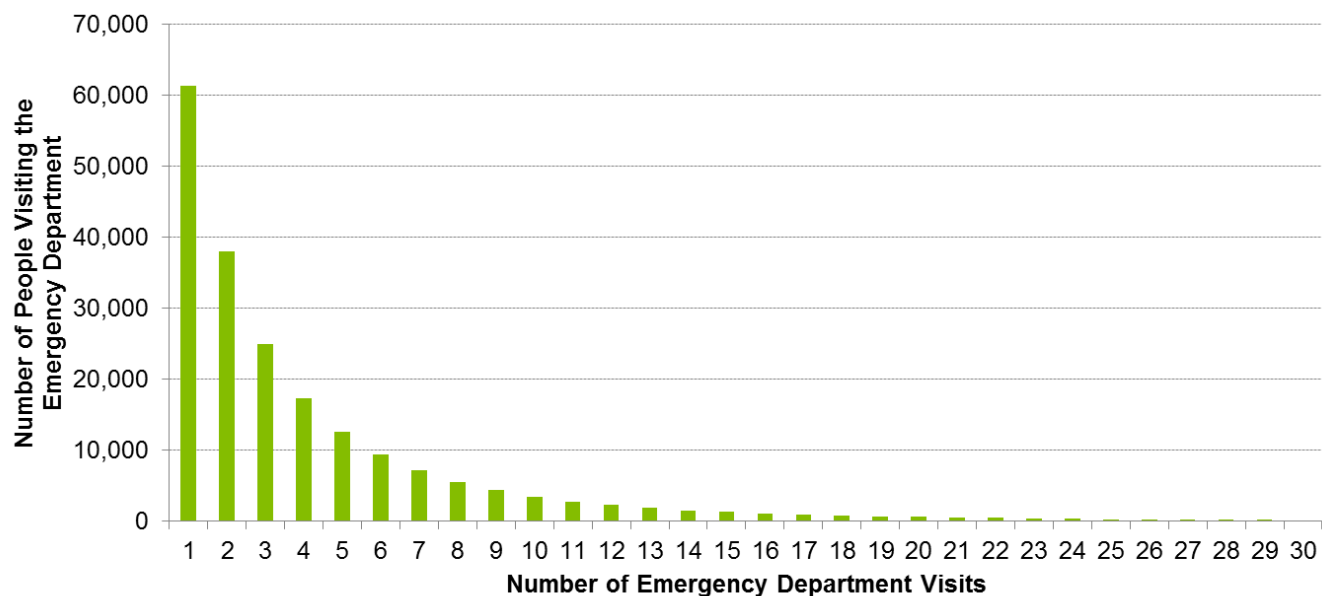
### Income Support (IS), and Assured Income for the Severely Handicapped (AISH)

Income Support is a government program that provides financial assistance to individuals (aged 16 and older) who are unable to meet their basic needs. The AISH program provides financial and health-related assistance to adult Albertans (aged 18 and older) who have a severe handicap that is permanent and substantially limits ability to earn a living.

Ministry partners indicated that the most useful marker of a "high user" of AISH or Income Support would be an individual that was admitted and discharged from the programs in rapid succession, rather than the total number of years on AISH or Income Support. Unfortunately only the year that an individual was supported by those programs was included in the Income Support data, meaning it would not be possible to identify true "high users". Therefore the marker for AISH or Income Support is *any use* of either these programs at any time during the 5 year period. We acknowledge that this isn't actually "high use" of these programs. For ease of discussion, however, the term high users is used to describe individuals who are recipients of AISH or IS and are high users of the ER and/or of the justice system.

### High Use of the Emergency Room (ER)

The distribution of emergency room visits between 2005/06 and 2009/10 among young adults was highly skewed (Figure 37, page 28), with an average of 4.6 visits over the time period (Table 7, page 28). The top 10% of users had 10 or more emergency room visits over the time period. For this reason, high use of the emergency room in this age group was defined as 10 or more emergency room visits between 2005/06 and 2009/10.



**Figure 37. Number of Emergency Department Visits between 2006 and 2010 among young adults in Alberta**

**Table 7. Number of Emergency Department Visits between 2006 and 2010**

Mean	Median	Minimum	25th percentile	75th percentile	90th percentile	99th percentile	Maximum
4.6	3	1	1	5	10	30	767

### Education - High School Completion

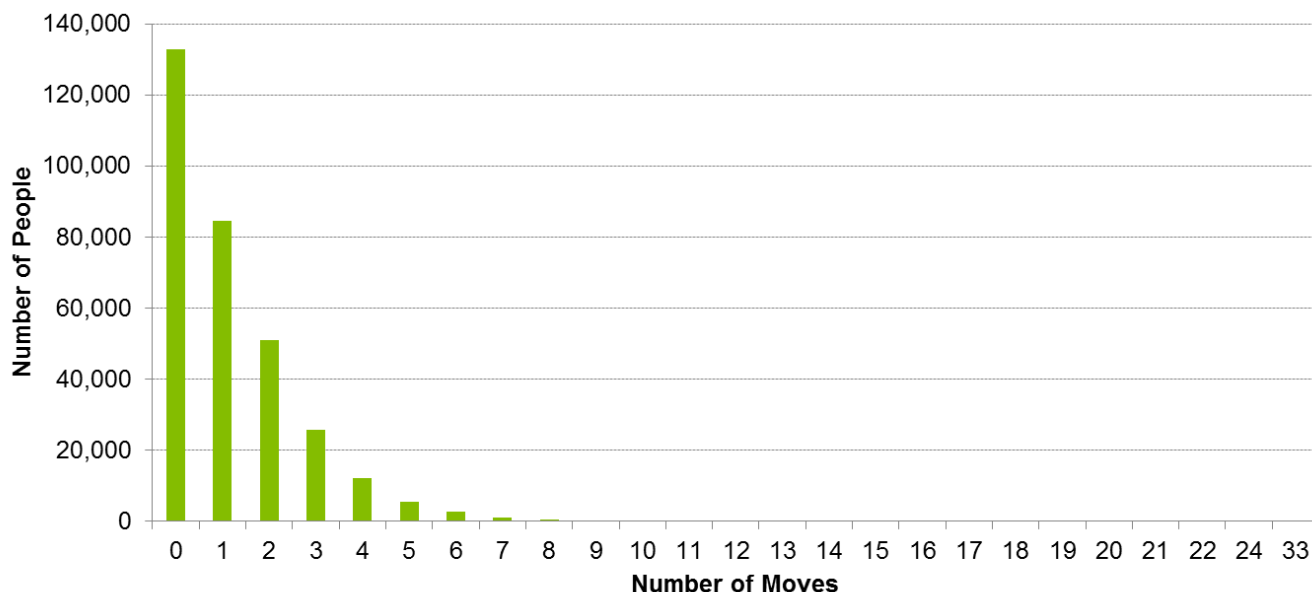
Analyses including education variables were only done for individuals who were part of the educational system during the study period. As this study included people age 18-25, there were many individuals who were excluded from this particular analysis.

A record for high school completion was based on being a credentialed completer or non-credentialed completer during the study period. A credentialed completer has a high school diploma, high school equivalency diploma, or a certificate of achievement. A non-credentialed completer has post-secondary attendance, apprenticeship, or achieved academic standing with course completion, but does not have a diploma or certificate as found with credentialed completers. Both credentialed and non-credentialed completers were considered as having completed high school.

### Number of Moves (Residential Moves)

The number of moves was determined by the number of unique postal codes within the Alberta Health Care Insurance Plan registry during the study period. The distribution of residential moves between the 2005/06 and 2009/10 among young adults was highly skewed (Figure 38, page 29), with an average of 1 move over the time period (Table 8, page 29). The top 10% had 3 or more residential moves over a five year period, and the top 1% had 6 or more residential moves over a five year period. Please note that since health care premiums ceased to be collected on January 1, 2009, addresses in the registry have been updated less often since that time, reducing their accuracy.





**Figure 38. Number of residential moves between 2005/06 and 2009/10 among young adults in Alberta**

**Table 8. Number of residential moves between 2005/06 and 2009/10**

Mean	Median	Minimum	25th percentile	75th percentile	90th percentile	99th percentile	Maximum
1	1	0	0	2	3	6	33

### Variables Utilizing Health Diagnostic Codes (Mental Health, Substance Use, Alcohol Dependence, Self-Harm, and Homelessness)

When an individual receives medical care in a hospital, clinic, emergency room or physician office visit, a code is attached to the record that indicates what diagnoses the physician gave or suspects in a particular encounter. These codes (called International Classification of Disease, 9th Revision [ICD-9] and International Classification of Disease, 10th Revision [ICD-10]) are based on the World Health Organization, are standard across Canada, and are comprehensive. While there are strengths and limitations, it is common for researchers to utilize these codes to determine what conditions individuals in a research study might have. This study utilized diagnostic codes to create indicators of pregnancy, delivery, homelessness, self-harm, and different other health-related variables. Table 9 (page 30) lists the ICD-9 and ICD-10 codes utilized to define each condition. Indicators of trauma and abuse were based on the Canadian Institute for Health Information definitions.<sup>5</sup> The indicator of traumatic brain injury was based on the case definition from Injury Prevention Centre in Alberta.<sup>6</sup>

While receiving a diagnostic code for a particular condition suggests that the individual may have that condition, it is not guaranteed as individuals can receive various potential diagnoses until the true condition is determined. In addition, diagnosis codes are only reported when an individual seeks medical attention – it is likely that there are many individuals who have a particular condition who have not sought medical attention during the time period, or were diagnosed prior to the start of the study period. This is especially true for mental health conditions, substance use, alcohol dependence, self-harm, and homelessness. Note that a diagnostic code does not indicate a distinct diagnostic event.

Indicators of visible homelessness are especially challenging using administrative data, as (1) approximately 10-20% of homeless youth are likely identified using this method; (2) only homeless youth who sought medical attention are captured, and (3) it is likely the case that youth who are visibly homeless or have conditions stereotypically associated with visible homelessness are more likely to be represented. For instance, a medical team maybe more

likely to use the homelessness diagnostic code if there was some reason for them to inquire or about, or suspect, visible homelessness. Therefore the youth identified here as homeless may be more marginalized than the general population of homeless youth, and it is less likely that couch surfers or other less visibly homeless youth would be captured. For this reason, the indicator developed here is referred to as diagnostic codes for visible homelessness.

It is also important to note that because administrative data are being used to assess visible homelessness, it is impossible to know when youth actually became homeless. For example, a young person could have been homeless for several years prior to receiving medical attention that resulted in a diagnostic code for visible homelessness. Homeless youth not identified with a diagnostic code would be considered housed for this analysis. However, given that there were 760 youth identified as homeless in the 7 Cities street count, and there were over 174,000 youth included as part of this study, this would not appreciably affect the resulting estimates for the housed population. Please see the data notes of the report entitled “Youth Homelessness: Risk Factors and Outcomes” for a discussion of the validity of the measure and a comparison to published reports on the prevalence of homelessness: <https://policywise.com/data/p2/>.

**Table 9. ICD-9 and ICD-10 Codes Utilized**

	<b>ICD-9 Codes Utilized (Physician Claims Dataset)</b>	<b>ICD-10 Codes Utilized (Hospital Inpatient Stays, Outpatient Clinics, and Emergency Room Visits)</b>
<b>Pregnancy</b>	<ul style="list-style-type: none"> <li>• 630-639 Pregnancy with abortive outcome</li> <li>• 650-659 Normal delivery, and other indications for care in pregnancy, labour and delivery</li> <li>• 660-669 Complications occurring mainly in the course of labour and delivery</li> <li>• V22-V24, V27-V28 Persons encounter health services in circumstances related to reproduction and development</li> <li>• V30-V39 Healthy liveborn infants according to type of birth</li> <li>• V81 Persons without reported diagnosis encountered during examination and investigation of individuals and populations</li> </ul>	<ul style="list-style-type: none"> <li>• O03 Spontaneous abortion</li> <li>• O04 Complications following (induced) termination of pregnancy</li> <li>• O05 Other abortion</li> <li>• O6 Complications of labor and delivery</li> <li>• O32 Maternal care for malpresentation of fetus</li> <li>• Z33 Pregnant State</li> <li>• Z34 Encounter for supervision of normal pregnancy</li> <li>• Z35 Supervision of high-risk pregnancy</li> <li>• Z36 Encounter for antenatal screening of mother</li> <li>• Z37 Outcome of delivery</li> <li>• Z38 Liveborn infants according to place of birth and type of delivery</li> </ul>
<b>Delivery</b>	<ul style="list-style-type: none"> <li>• 650-659 Normal delivery, and other indications for care in pregnancy, labour and delivery</li> <li>• 660-669 Complications occurring mainly in the course of labour and delivery</li> </ul>	<ul style="list-style-type: none"> <li>• O6 Complications of labor and delivery</li> <li>• Z37 Outcome of delivery</li> <li>• Z38 Liveborn infants according to place of birth and type of delivery</li> </ul>
<b>Substance Use</b>	<ul style="list-style-type: none"> <li>• 291 Alcoholic psychoses</li> <li>• 292 Drug psychoses</li> <li>• 303 Alcohol dependence syndrome</li> <li>• 304 Drug dependence</li> <li>• 305 Nondependent abuse of drugs</li> </ul>	<ul style="list-style-type: none"> <li>• X40-49 Accidental poisoning by and exposure to noxious substances</li> <li>• T36-T50 Poisoning by drugs and biological substances</li> <li>• F10-F19 Mental, behavioural, and neurodevelopment disorders due to substance use</li> <li>• F55 Abuse of non-dependence-producing substances</li> <li>• Z50.2 Alcohol rehabilitation</li> <li>• Z50.3 Drug rehabilitation</li> </ul>



**Table 9. ICD-9 and ICD-10 Codes Utilized (Cont'd)**

	<b>ICD-9 Codes Utilized (Physician Claims Dataset)</b>	<b>ICD-10 Codes Utilized (Hospital Inpatient Stays, Outpatient Clinics, and Emergency Room Visits)</b>
<b>Alcohol use</b>	<ul style="list-style-type: none"> <li>• 291 Alcoholic psychoses</li> <li>• 303 Alcohol dependence syndrome</li> <li>• 305 Nondependent abuse of drugs</li> </ul>	<ul style="list-style-type: none"> <li>• F10 Mental and behavioural disorders due to use of alcohol</li> <li>• G31.2 Degeneration of nervous system due to alcohol</li> </ul>
<b>Homelessness</b>	<ul style="list-style-type: none"> <li>• V60.0 Lack of housing</li> </ul>	<ul style="list-style-type: none"> <li>• Z59.0 Homelessness</li> </ul>
<b>Schizophrenia</b>	<ul style="list-style-type: none"> <li>• 295 Schizophrenic psychoses</li> </ul>	<ul style="list-style-type: none"> <li>• F20 Schizophrenia</li> <li>• F21 Schizotypal disorder</li> <li>• F23.2 Acute schizophrenia-like psychotic disorder</li> <li>• F25 Schizoaffective disorders</li> </ul>
<b>Personality Disorder</b>	<ul style="list-style-type: none"> <li>• 301 Personality disorders</li> </ul>	<ul style="list-style-type: none"> <li>• F34.0 Cyclothymia</li> <li>• F60 Specific personality disorders</li> <li>• F61 Mixed and other personality disorders</li> <li>• F62 Enduring personality changes, not attributable to brain damage and disease</li> <li>• F68.1 Intentional production or feigning of symptoms or disabilities</li> <li>• F68.8 Other specified disorders of adult personality and behaviour</li> <li>• F69 Unspecified disorder of adult personality and behavior</li> </ul>
<b>ADHD</b>	<ul style="list-style-type: none"> <li>• 314 Hyperkinetic syndrome of childhood</li> </ul>	<ul style="list-style-type: none"> <li>• F90 Attention-deficit hyperactivity disorders</li> </ul>
<b>Adjustment</b>	<ul style="list-style-type: none"> <li>• 309 Adjustment reaction</li> </ul>	<ul style="list-style-type: none"> <li>• F43 Reaction to severe stress, and adjustment disorders</li> </ul>
<b>Bipolar</b>	<ul style="list-style-type: none"> <li>• 296 Affective psychoses</li> </ul>	<ul style="list-style-type: none"> <li>• F30 Manic episode</li> <li>• F31 Bipolar disorder</li> </ul>
<b>Conduct</b>	<ul style="list-style-type: none"> <li>• 312 Disturbance of conduct not elsewhere classified</li> </ul>	<ul style="list-style-type: none"> <li>• F91 (expect F91.3) Conduct disorders</li> </ul>
<b>Anxiety</b>	<ul style="list-style-type: none"> <li>• 300.0 Anxiety states</li> <li>• 300.2 Phobic state</li> <li>• 300.3 Obsessive-compulsive disorders</li> </ul>	<ul style="list-style-type: none"> <li>• F40 Phobic anxiety disorders</li> <li>• F41 Anxiety disorders</li> <li>• F42 Obsessive-compulsive disorder</li> </ul>
<b>Depression</b>	<ul style="list-style-type: none"> <li>• 296.1-296.8 Affective psychoses</li> <li>• 300.4 Neurotic depression</li> <li>• 311 Depressive disorder, not elsewhere classified</li> </ul>	<ul style="list-style-type: none"> <li>• F32 Major depressive disorder, single episode</li> <li>• F33 Recurrent depressive disorder</li> <li>• F34.1 Dysthymia</li> <li>• F38.0 Other single mood [affective] disorders</li> <li>• F38.1 Other recurrent mood [affective] disorders</li> <li>• F41.2 Mixed anxiety and depressive disorder</li> <li>• F53.0 Mild mental and behavioural disorders associated with the puerperium, not elsewhere classified</li> <li>• F93 Emotional disorders with onset specific to childhood</li> </ul>

**Table 9. ICD-9 and ICD-10 Codes Utilized (Cont'd)**

	<b>ICD-9 Codes Utilized (Physician Claims Dataset)</b>	<b>ICD-10 Codes Utilized (Hospital Inpatient Stays, Outpatient Clinics, and Emergency Room Visits)</b>
<b>Self-Harm</b>		<ul style="list-style-type: none"> <li>• T39-T43, T50.9 Poisoning by drugs, medicaments and biological substances</li> <li>• T58 Toxic effect of carbon monoxide</li> <li>• X40-X47 Accidental poisoning by and exposure to noxious substances</li> <li>• X60-X84 Intentional self-harm</li> <li>• Y10, Y11, Y12, Y16, Y17 Poisoning by and exposure to noxious substances, undetermined intent</li> <li>• T39 Poisoning by nonopioid analgesics, antipyretics and antirheumatics</li> <li>• T40 Poisoning by narcotics and psychodysleptics [hallucinogens]</li> <li>• T42.1, T42.3, T42.7 Poisoning by antiepileptic, sedative-hypnotic and antiparkinsonism drugs</li> <li>• T43 Poisoning by psychotropic drugs, not elsewhere classified</li> </ul>
<b>Trauma</b> <b>Indicator of trauma was based on the CIHI's case definition</b> <b>Canadian Institute for Health Information.</b> <b>Head Injuries in Canada: A Decade of Change (1995-1995 to 2003-2004).; 2006.</b>		<ul style="list-style-type: none"> <li>• W00-W19 External causes of morbidity and mortality due to falls</li> <li>• W20-W45 Exposure to inanimate mechanical forces</li> <li>• W49 Exposure to other and unspecified inanimate mechanical forces</li> <li>• W50-W60 Exposure to animate mechanical forces</li> <li>• W64 Exposure to other and unspecified animate mechanical forces</li> <li>• W65-W70 Accidental drowning and submersion</li> <li>• W73-W74 Other specified and unspecified drowning and submersion</li> <li>• W75-W84 Other accidental threats to breathing</li> <li>• W85 -W99 Exposure to electric current, radiation and extreme ambient air temperature and pressure</li> <li>• X00-X09 Exposure to smoke, fire and flames</li> <li>• X10 Contact with hot drinks, food, fats and cooking oils</li> <li>• X30-X39 Exposure to forces of nature</li> <li>• X50 Overexertion and strenuous or repetitive movements</li> <li>• X52 Prolonged stay in weightless environment</li> <li>• X58 Exposure to other specified factors</li> <li>• X59 Exposure to unspecified factor</li> <li>• V01-V99 External causes of morbidity and mortality by transport accidents</li> <li>• Y20-Y29 Event of undetermined intent</li> <li>• Y35 Legal intervention</li> <li>• Y36 Operations of war</li> </ul>





**Table 9. ICD-9 and ICD-10 Codes Utilized (Cont'd)**

	<b>ICD-9 Codes Utilized (Physician Claims Dataset)</b>	<b>ICD-10 Codes Utilized (Hospital Inpatient Stays, Outpatient Clinics, and Emergency Room Visits)</b>
<b>Traumatic Brain Injury Indicator was based on the Injury Prevention Centre's case definition Injury Prevention Centre. Traumatic Brain Injuries in Alberta, Hospital Admissions (2005-2014)/Emergency Department Visits (2011-2014). Edmonton, Alberta; 2017.</b>		<ul style="list-style-type: none"> <li>• S02.0, S02.1, S02.7, S02.9 Fracture of skull and facial bones</li> <li>• S06.1-S06.9 Intracranial injury</li> <li>• S07.1, S07.8, S07.9 Crushing injuries and traumatic amputations of specified and multiple body regions</li> <li>• T02.00, T02.01 Fractures involving multiple body regions</li> </ul>
<b>Assault</b>		<ul style="list-style-type: none"> <li>• X85-X89 Assault by drugs, corrosive substance, pesticides, gases and vapours, other specified and unspecified chemicals or noxious substances</li> <li>• X90-95 Assault by hanging, strangulation, suffocation, drowning and submersion, handgun, rifle, shotgun or unspecified firearm</li> <li>• X96-99 Assault by explosive material, smoke, fire and flames, steam, hot vapours, hot objects, sharp objects</li> <li>• Y00-Y04 Assault by blunt object, pushing from a high place, pushing or placing victim before moving object, crashing of a motor vehicle, bodily force</li> <li>• Y08-09 Assault by other specified or unspecified means</li> </ul>
<b>Sexual Assault</b>	<ul style="list-style-type: none"> <li>• V71.5 Observation following alleged rape or seduction</li> </ul>	<ul style="list-style-type: none"> <li>• Y05 Sexual assault by bodily force</li> <li>• T74.2 Sexual abuse</li> </ul>
<b>Abuse</b>	<ul style="list-style-type: none"> <li>• 995.5 Child maltreatment syndrome</li> </ul>	<ul style="list-style-type: none"> <li>• Y05 Sexual assault by bodily force</li> <li>• Y06 Neglect and abandonment</li> <li>• Y07 Other maltreatment syndromes</li> <li>• T74 Adult and child abuse, neglect and other maltreatment, confirmed</li> <li>• Z04.5 Examination and observation following other inflicted injury</li> </ul>
<b>Frost-bite or hypothermia</b>	<ul style="list-style-type: none"> <li>• 991 Effects of reduced temperature</li> </ul>	<ul style="list-style-type: none"> <li>• T33 Superficial frostbite</li> <li>• T34 Frostbite with tissue necrosis</li> <li>• T35 Frostbite involving multiple body regions and unspecified frostbite</li> <li>• T68 Hypothermia</li> <li>• T69 Other effects of reduced temperature</li> </ul>

## THE CHILD AND YOUTH DATA LABORATORY

The **Child and Youth Data Laboratory's** (CYDL's) Longitudinal Project (Experiences of Albertan Children and Youth over Time, 2005/06 to 2009/10/11) is a joint initiative between PolicyWise for Children & Families and participating ministries in the Government of Alberta. The mandate of the CYDL is to link and analyze administrative data from Government ministries, to provide evidence for policy and program development.

The CYDL is managed by **PolicyWise for Children & Families**. PolicyWise is a not-for-profit organization whose mission is to develop and integrate evidence to inform, identify and promote effective public policy and service delivery to improve the well-being of children, families and communities in Alberta, Canada and internationally.

### THIS PROJECT

The CYDL Longitudinal Project focuses on understanding the experiences of Albertan children and youth as they develop. The focus is service use within and across ministries, as it is related to key indicators and to the passage of time. Studying experiences over several years of development adds a valuable level of richness to an already ground-breaking initiative, providing detailed insight into the factors that help to shape our children and youth as they develop.

### SUGGESTED CITATION

Child and Youth Data Laboratory (2019). *Shared Clients: Health, Mental Health, and Social Characteristics of High Users of the Health, Justice, and Community and Social Support Systems*. Edmonton, Alberta: PolicyWise for Children & Families.

### OUR PARTNERS

This project was carried out in partnership with seven ministries of the Government of Alberta. Each ministry collaborated extensively with the CYDL on this project, and their dedication to the project is gratefully acknowledged:

**Children's Services**  
**Advanced Education**  
**Justice and Solicitor General**  
**Indigenous Relations**

**Community and Social Services**  
**Health**  
**Education**

### PREPARED BY

Allison N. Scott, PhD; Natasha Lifeso, BSc; Carley Piatt, PhD; Yunqi Zhang, MSc; and Xinjie Cui, PhD.

### CONTACT US

(780) 944-8630

[info@policywise.com](mailto:info@policywise.com)

[www.policywise.com](http://www.policywise.com)

*This study is based in part on data provided by the Government of Alberta. The interpretation and conclusions contained herein are those of the researchers and do not necessarily represent the views of the Government of Alberta. The Government of Alberta does not express any opinion in relation to this study.*

