NORTHERN TERRITORY GOVERNMENT

menzies school of health research

Measuring Incidence and prevalence gambling-related harms in the Northern Territory

August 2021

Measuring Incidence and prevalence gambling-related harms in the Northern Territory

August 2021

Menzies School of Health Research

Measuring Incidence and prevalence gambling-related harms in the Northern Territory

ISBN (paperback):
ISBN (online):

Printed by Uniprint NT, Charles Darwin University

PREFACE

This report presents an analysis of gambling-related harms data from the 2015 and 2018 NT Gambling Prevalence and Wellbeing Surveys. It reports on the development of a list of harms for use in the 2015 and 2018 NT Gambling Prevalence and Wellbeing Surveys. Prevalence and incidence of gambling harms are presented for five domains: emotional/psychological, financial, relationship/family, work/study and criminal. Incidence rates were highest for emotional/psychological and financial harm domains. As problem gambling risk increases, incidence rates of harm across all domains increase. The results will be of use to policy makers in government tasked with developing legislation and regulatory approaches to minimise harms associated with gambling, industry in understanding risks and harms from gambling and counselling services treating clients experiencing gambling-related harms.

REPORT AUTHOR

Dr Matthew Stevens, Senior Research Fellow, Menzies School of Health Research

THE RESEARCH TEAM

Dr Matthew Stevens, Senior Research Fellow, Menzies School of Health Research
Dr Himanshu Gupta, Research Fellow, Menzies School of Health Research
Dr Noemi Tari-Keresztes, Research Fellow, Menzies School of Health Research
Dr Mal Flack, School of Psychological & Clinical Sciences, Charles Darwin University

ACKNOWLEDGMENTS

The research team would like to thank participants in the 2015 and 2018 NT Gambling Prevalence and Wellbeing Surveys for their time.

FUNDING

Funding for the report came from the Northern Territory Government Department of Industry, Tourism and Trade through the Community Benefit Fund.

CONFLICTS OF INTEREST

The research team do not have any conflicts of interest to declare.

SUGGESTED CITATION

Stevens, M. 2021. *Measuring Incidence and prevalence gambling-related harms in the Northern Territory*. Menzies School of Health Research, Darwin.

CONTENTS

CONTENTS: Figures

CONTENTS: Tables

EXECUTIVE SUMMARY

Up until several years ago there were no validated scales for measuring harms from own or others gambling. However, in the NT, a harms list was developed using Delphi methodology (an expert group) for use in a project determining the extent of gambling related harms among Aboriginal clients attending a range of services in Darwin. A goal of the harms list when it was conceptualised was that the same items could be used for harms from own gambling, and for affected others. The list was subsequently amended for use in the 2015 NT Gambling Prevalence and Wellbeing Survey and further modified for use in the 2018 survey. The 2015 survey asked respondents whether the harm occurred in the last year, while the 2018 survey asked how often, using the same approach used in gambling prevalence surveys to measure frequency of gambling (i.e. respondents answer per week, per month or per year).

Using data from the 2018 NT Gambling Prevalence and Wellbeing Surveys, this report presents the prevalence and incidence of gambling-related harms across five domains of harm: (i) emotional/psychological, (ii) financial, (iii) relationship/family, (iv) work/study, and (v) criminal. It does this for harm to the gambler from their own gambling, harm to someone else (not the gambler). Statistical analyses asses the association between incidence of own gambling harm and problem gambling risk, and frequency of gambling on select activities. Multivariable models are developed identifying significant correlates of harm form someone else's gambling for incidence, number, and any harm from gambling.

The results show that measuring the incidence of harms can be achieved in gambling prevalence telephone surveys, and that using the incidence of harms is a powerful way of understanding the extent of all gambling-related harms and their relationship with other known health risk factors. Incidence of own gambling harms among gamblers at-risk of problem gambling was high among the affected population, with financial, emotional/ psychological and relationship/family most commonly occurring with incidence rates above 30 times per person per year. All domains of harm from own gambling incidence rates increased with increasing problem gambling risk, with those classified as experiencing problem gambling experience significantly higher incidence of gambling harm than gamblers at moderate or low risk of problem gambling. Incidence of harms among those affected by someone else's gambling while low in the total adult population (less than 9 per person per year) was high when only using the population affected (total of 112 per person per year ranging from 20 for criminal harms and around 60 for financial, emotional/psychological and relationship/family harm domains). Different correlates of incidence of gambling harm form someone else's gambling differed between the Aboriginal and non-Indigenous populations and are presented separately.

Gambling is causing a significant burden in the population affected by their own gambling (approximately 20,850 gamblers at-risk of problem gambling and 2,500 problem gambling) and the 8.1% or 14,500 adults negatively affected by someone else's gambling. Associations between domestic/family violence and psychological distress require attention moving forward to assess the direction of causation and develop resources for health promotion about harms associated with gambling.

1.0 INTRODUCTION

1.0 Background

Socio-demographic and socioeconomic characteristics of people can differentially expose individuals to health risks and gambling-related harms (Marmot and Wilkinson 1999, Canale, Vieno et al. 2016, Langham, Thorne et al. 2016). Gamblers at risk of problem gambling can negatively impact on themselves, other individuals, families and communities, and recent research has now identified the range of harms arising from problematic gambling (Productivity Commission 2010, Afifi, LaPlante et al. 2014, Langham, Thorne et al. 2016). Gambling is increasingly being viewed as social determinant of health that require public health policy responses to reduce associated harms (Marshall 2009, Browne, Langham et al. 2016, Browne, Greer et al. 2017, Browne, Rawat et al. 2017). In a large qualitative study Langham *et al*. (2016), identified over 70 specific harms that could arise directly or indirectly from gambling, and classified these under domains: financial harms; relationship disruption, conflict or breakdown; emotional or psychological distress; decrements to health; cultural harms; reduced performance at work or study, and criminal activity. Within each dimension of the framework classifies the severity of the harm as either 'general', 'crisis' or 'legacy' affects, and these can extend over the life course and in some cases be intergenerational (Dowling, Jackson et al. 2010, Suomi, Jackson et al. 2013). Furthermore, harms can extend beyond individuals to families and communities, with some harms being amplified depending on community characteristics (e.g. population size, area level socioeconomic disadvantage). Stevens and Bailie (2012) found that community level gambling problems had a greater effect size on child health, compared with household level gambling problems in remote Aboriginal communities. Additionally, shame associated with problem gambling or being the partner of someone experiencing gambling problems is often more visible in small communities which may lead to feelings of stigmatisation (Langham, Thorne et al. 2016).

The reach and extent of gambling related harms on population health was recently assessed by Browne and colleagues (2016) using a burden of disease modelling approach (Browne, Langham et al. 2016). This technique has been used extensively in health research to determine the burden in the population of different illnesses, diseases and health risk factors (World Health Organisation 2009). The authors found that numerically more harms occur amongst gamblers experiencing moderate and low risk problem gambling, rather than problem gambling, because these groups have much larger absolute numbers of gamblers in them compared with the problem gambling group. Specifically, they found that low risk, moderate risk and problem gamblers share 50%, 35% and 15% respectively, of the total burden arising from gambling. Furthermore, the harm to other's from gambling was also assessed, and found that 14% of the total burden was occurring in the form of harm to another person, which was based on a prevalence of 2.8% of Victorian adults indicating that someone else's gambling had caused them a problem in the previous 12 months (Hare 2015).

The 2014 Victorian study was the first population survey in Australia to collect information on harm from another person's gambling. The exact wording of the question used was, "In the last 12 months, have you experienced problems because of someone else's gambling?". Hare (2015) found that across all adults, 2.8% indicated they had experienced problems because of someone else's gambling, though this varied between non-gamblers (1.5%), non-risk gamblers (1.9%), low-risk gamblers

(7.4%), moderate risk gamblers (7.7%) and problem gamblers (10.5%). This survey did not collect any information on the types of harms experienced.

In 2015 Menzies was commissioned by the NT Government to conduct a gambling prevalence survey. At this time, no validated lists of gambling harms had been developed for use in population surveys. A previous study which involved a partnership between Amity Community services (main gambling counselling service in the Darwin region) was investigating the extent of gambling-related harms in Aboriginal clients attending a range of different services in and around Darwin and Palmerston. The project came from an identified need to better understand the extent of gambling-related harms occurring within in the urban Aboriginal and Torres Strait Islander population of Darwin. The project originally planned to work with organisations whose clientele were predominantly Aboriginal and Torres Strait Islander, but the scope was expanded to include as many organisations as possible and include both non-Indigenous and Aboriginal and Torres Strait Islander people in any screening process. The team did not want to just measure problem gambling risk but wanted to also focus on harms arising from gambling, whether it be the person's own gambling or someone else's. There were no available lists of harms that could be used for the project at the time, so the project team went about developing a measure of harms for use in the project.

1.2 Development of the harms list for Gambling Data Collection and Screening Project

Table 1 lists twelve organisations, including the lead agency Amity Community Services, that were involved in the *Gambling Data Collection and Screening Project*. In these meetings, various aspects of gambling and how it affected their clients were discussed, and all agencies agreed that it would be useful to capture information on gambling as an underlying issue with their client base. It was also agreed that gambling-related harms experienced by affected others should be collected, particularly given most agencies noted that a portion of their clients were affected others. Service providers identified a lack of recognition by the Northern Territory Department of Health in recognising gambling as an activity that can seriously affect the health of people, both psychologically and physically. They also noted that gambling should be included with alcohol and other drug treatment services, and that resources needed to be developed educating people on the harms of gambling and to reduce stigma around help-seeking behaviour associated with gambling-related problems.

Table 1: Organisations who attended planning meetings for the Amity Gambling Data Collection and Screening Project

Organisation	Jul 2009	Aug 2009	Sep 2009	Oct 2009	Feb 2010	Launch Oct 2014	MoU Mar 2015
Amity Community Services Inc	x	x	x	x	x	x	x
CatholicCare	x					x	
AngliCare						x	x
Relationships Australia						x	
DAIWS/DAIWS Outreach	x		x	x	x		x
CAAPS	x		x				
Menzies/CDU (The NI)	x	x	x	x	x	x	x
FORWAARD	x		x				
Danila Dilba Medical Service	x	x	x	x		x	

Organisation	Jul 2009	Aug 2009	Sep 2009	Oct 2009	Feb 2010	Launch Oct 2014	MoU Mar 2015
Ironbark Money Management	x	x	x	x	x	x	
NT Stolen Generation	x						
NAAJA		x			x	x	x

Developing a harms list

It was after this meeting that we convened a brainstorming session to come up with a list of harms that could be used in a gambling harms screen. The group included an Aboriginal person (expert by experience) working with Amity on the screening project, two gambling counsellors from Amity, the first author and a consultant psychologist working with Amity at the time. The approach used to develop the harms lists is similar to the Delphi method, where experts are asked a series of questions interspersed with opinion and feedback in order to establish convergence of opinion (Okoli and Pawlowski 2004). An earlier version of the list is shown in Table 2 was originally developed for people who had been negatively affected by someone else's gambling. The list used generic domains, with examples of harms, with people who answered that they had been negatively affected by someone else's gambling, read out the list and they could select all that applied to their situation.

Table 2: Original harms (domains) piloted in Amity screening project

In what ways has this person's gambling affected you? (mark all that apply)	
Financial (e.g. money worries, debt, bankruptcy)	
Personal issues (e.g. depression, anxiety, loss of sleep)	
Domestic/ Family violence	
Neglecting relationships (e.g. with partner/child)	
Criminal (e.g. property loss, fraud)	
Stigma (e.g. being harassed/threatened)	
Other (please list in next column)	

A second list of harms was developed for use with people who were experiencing gambling problems personally. These people were classified as no or little, medium or high risk of experiencing problem gambling using a scaled down three question version of the PGSI, which was tested using data from the 2005 NT Gambling Prevalence Survey (Young, Abu-Duhou et al. 2006). This list included twenty possible harms and was intended to be exhaustive, and cover most or all the potential harms that could arise because of someone's gambling problems. The list covered harms from the domains that were previously identified by the Delphi group (see Table 3), and included: *financial* (ran out of money for rent, ran out of money for food, raided savings accounts/funds, borrowed money from family or friends, sold/hocked possessions to make ends meet); *criminal* (stole something, trouble with police, physical fights with friends/ acquaintances, and physical fights with family); *relationships* (arguments with friends/ acquaintances, hidden (lied about) your gambling, lost friends (e.g. no longer speak to you), marriage or relationship ended, arguments with family, and family not talking to you); *psychological/health* (sick with stress or anxiety or depression, drank alcohol more heavily, and used drugs more heavily); and *work related* (took time off work, and lost a job).

The Delphi group acknowledged that the harms in the list were not likely to occur independently of each other. For example, it is very likely that financial harms co-occur

with relationship harms, and similarly may be related to criminality and work-related harms. For the screening project, all questions on gambling patterns (e.g. frequency of gambling by activity, modified PGSI) used a six-month period to assess patterns of gambling and harms. This was decided on, rather than a 12-month period, which is more standard, to fit within the service model of agencies (i.e. they are usually dealing with acute problems). After piloting the screening questions with counsellors at Amity, feedback indicated that it would be better to use the same harms list that was used for the at-risk gamblers, with people affected by someone else's gambling.

Table 3 lists the final harms list used in the Amity screening project, and lists developed for the 2015 and 2018 NT Gambling Prevalence and Wellbeing Surveys. The harms lists in 2015 and 2018 surveys was used for harms from own gambling questions, and harms from someone else's gambling question, and the 20015 and 2018 harms lists will be used for analyses in this report.

Table 3: Harms list used in Amity screening project, and the 2015 and 2018 NT Gambling Prevalence and Wellbeing Surveys

Financial	Relationship/family	Emotional/ psychological	Work/study	Criminal
Amity harms list = 20				
1. Ran out of money for rent 2. Ran out of money for food 3. Raided savings accounts/funds 4. Borrowed money from family or friends 5. Sold/hocked possessions to make ends meet	1. Lost friends (e.g. no longer speak to you) 2. Marriage or relationship ended 3. Arguments with family 4. Family not talking to you 5. Arguments with friends/acquaintances 6. Physical fights with friends/acquaintances 7. Physical fights with family 8. Hidden (lied about) your gambling	1. Sick with stress or anxiety or depression 2. Drank alcohol more heavily 3. Used drugs more heavily	1. Took time off work 2. Lost a job	1. Stole something 2. Trouble with the police
2018 survey harms list = 18 + other				
1. Ran out of money for rent or mortgage 2. Ran out of money for food 3. Ran out of money for other bills (e.g. electricity or phone) 4. Raided savings accounts/funds 5. Increased credit card debt 6. Debt collectors repossessed goods 7. Sold or hocked possessions 8. Borrowed money form family of friends (could be RF)	1. Relationship problems with close friends or family 2. Physical or verbal violence toward you 3. Children did not attend school or missed out on things (e.g. school excursion)	1. Felt stressed or anxious 2. Felt depressed 3. Felt ashamed or had regrets	1. Missed work or study classes 2. Underperformed at work or study 3. Lost your job	1. Did something outside the law/illegal
2015 survey harms list = 15 + other				
1. Ran out of money for rent or mortgage 2. Ran out of money for food 3. Ran out of money for other bills (e.g. electricity or phone) 4. Raided savings accounts/funds 5. Increased credit card debt 6. Debt collectors repossessed goods 7. Sold or hocked possessions 8. Borrowed money from family or friends (could be RF)	1. Relationship problems with close friends or family 2. Physical or verbal violence toward you 3. Children did not attend school or missed out on something (e.g. school excursion, gift)	1. Felt stress, anxiety, depression 2. Felt ashamed or had regrets	1. Had a problem with work (e.g. time off, lost job)	1. Did something outside the law/illegal

However, to better understand the inter-relationships between harms for own gambling harms and affected others gambling harms, a detailed analysis is required.

1.3 Aims and objectives

The measurement of gambling-related harms in population surveys is required to ensure governments fully understand the impact of gambling on the total population. This report will analyse the gambling-related harms data collected in the 2015 and 2018 NT Gambling Prevalence and Wellbeing Surveys. It will:

1. Determine the inter-relationships between different harms for:
    a. own gambling harms and
    b. harms from someone else's gambling.
2. Determine if different types of gambling activities (and ways of gambling) are more conducive to gamblers experiencing harm from their own gambling.
3. Determine the relationship between own gambling harms and problem gambling risk and whether different domains of harms (e.g. financial, emotional/psychological etc.) are more associated with problem gambling risk than others.
4. Compare and contrast incidence of gambling harms by problem gambling risk with findings from the Browne et al (2017) study using the Burden of Disease modelling approach.
5. Determine which population segments (e.g. regions, Indigenous status, sex, employment status) experience significantly more gambling harms (own, others and total).

2 METHODS

2.1 Study site: The Northern Territory

The Northern Territory is the third largest jurisdiction in Australia in area, situated between Western Australia, Queensland, and South Australia, but has the smallest in population with around 180,000 adults in 2018. It has two larger population centres, Darwin (the capital also includes Palmerston, a satellite city) which contains over half the NT population, and Alice Springs with approximately 30,000. It differs from other Australian jurisdictions in having a younger population, having the largest proportion of Aboriginal and Torres Strait Islander people (just fewer than 30%), and an unequal ratio of adult males to females varying by location.

2.2 Data sources

The 2015 and 2018 NT Gambling Prevalence and Wellbeing Surveys were carried from October to November using random dialling from a dual frame samples with sample sizes of 4,945 and 5,000 respectively. Both surveys were weighted to the estimated resident population by age, sex and region, for the midpoint of the year, as generated by the Australian Bureau of Statistics. Both surveys included a sub-sample, where respondents answered several other questions related to health risk factors. The 2018 sample had a larger mobile phone sample (71%) compared with the 2015 survey (24%). Full survey methodology can be found in the main survey reports (Stevens, Thoss et al. 2017, Stevens, Gupta et al. 2020).

2.3 Statistical analysis

All analyses of survey data were on population weighted data, with standard errors adjusted for the survey design.

The analyses can be divided into four, with sub-analysis as per:

1. Own gambling harms,
    a. Descriptive statistics on number and types
    b. Factor analysis (inter-relationships) between types of own gambling harms (frequency and presence/absence)
    c. Association with problem gambling risk (PGSI)
    d. Incidence of own gambling harms by domain
    e. Incidence of own gambling harms by selected gambling activities
2. Gambling harms from others gambling,
    a. Descriptive statistics on number and types
    b. Factor analysis (inter-relationships) between types of own gambling harms
    c. Association with problem gambling risk (PGSI)
    d. Incidence of gambling harms by domain
    e. Socio-demographic, socioeconomic and health risk factors correlation with gambling harm from others gambling
3. Incidence of total gambling harm (own and from others)
4. Comparison of incidence of gambling harm and BoD modelling

<u>Inter-relationships between types of harms</u>

Exploratory factor analysis was performed on weighted and unweighted harms data from the 2015 and 2018 surveys to determine factor structure of harms and any changes in structure and inter-relationships between harms from the 2015 to 2018

surveys. This was done separately for harms from own gambling and harms from someone else's gambling and was performed on incidence data for 2015 and 2018. Harms with low endorsement (<0.5% or n=10) were excluded from this analysis. A factor analysis of the five domains of gambling harm was also carried out for own gambling harms among at-risk gamblers.

Incidence of gambling harms and domains

First, the incidence for individual harms within harm domains were added to obtain an incidence for each domain, using the domains and harm items listed in Table 3. For the emotional/psychological harms, an average was taken between 'felt stressed or anxious' and 'felt ashamed or had regrets' and added to the 'felt depressed' harm item. The criminal domain only had one item, so only this item was used. The item for 'verbal of physical abuse' could be criminal, particularly so if the abuse is physical; however, this item was included in the relationship/family domain. The total incidence for each domain was then graphed to determine the distribution of harm from own gambling by domain for at-risk (i.e. PGSI one or more) gamblers.

Domains of own gambling harm most associated with problem gambling risk

While the factor analysis identified correlations and clusters across different harms, harms could also be categorised into five pre-defined domains (financial, emotional/psychological, relationships and family, work/study, and criminal – see Table 3). Two approaches were used to assess the relationship between own gambling harms and problem gambling risk. First, the same pre-defined domains used to determine the distribution of gambling were to assess the association between problem gambling risk and harms from own gambling and incidence and incidence rates were tabulated. Second, grouping of individual harms that were determined through the factor analysis of the five harm domains from own gambling incidence, which grouped incidence of relationship/family, financial and criminal in domain/factor 1 and emotional/psychological and work/study in domain/factor 2. Simple negative binomial regression was used to determine significance between domains and problem gambling risk.

Factors associated harm from someone else's gambling

Multivariable analysis identifying significant correlates of harm from someone else's gambling was assessed using three statistical models. First, negative binomial regression was used to determine significant correlates between incidence of gambling harms and other factors including socio-demographic, socioeconomic, and health risk factors. Initially, separate models for incidence on different harm domains were to be carried out, but due to low prevalence, lower incidences and similarities in significant correlates, incidences across domains were summed as described previously. Second, negative binomial regression was again used, but this time to model the number of different harms endorsed by those negatively affected from someone else's gambling, with the same set of explanatory variables. Last, logistic regression was used to model endorsing at least one of the harms, again with the same set of explanatory variables.

Total incidence of gambling-related harms and Burden of Disease (BoD) modelling

Incidence of total gambling harms (adding together own and others gambling-related harms incidence) by domain was graphed and tabulated. The distributions between the BoD approach using disability weights applied to the 2018 NT prevalence

survey data, and incidences were then graphed together for own, others and total gambling-related harms.

3 RESULTS

3.1 Analyses of own gambling harms: At-risk gamblers

The first sub-section will present analyses related to own gambling harms for at-risk gamblers (i.e. those scoring one or more on the PGSI), before presenting the analyses of harms, some background on overall gambling participation and change in problem gambling risk between 2015 and 2018 is presented. This specifically shows that gambling participation has decreased, while problem gambling risk has increased between 2015 and 2018.

3.1.1 Change in gambling participation, 2015 to 2018

When analysing harms from own gambling and problem gambling risk, changes in gambling participation can affect estimates. Figure 1 shows that there was a significant ($p<0.01$) decrease in the prevalence of gambling in the NT adult population, and this decrease was similar across men and women (though marginally non-significant).

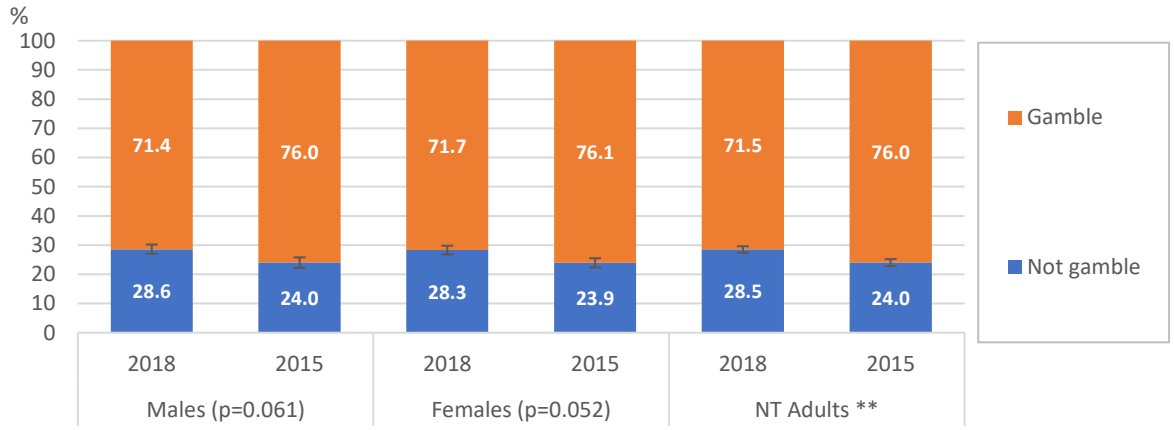

Figure 1: Gambling status by survey, 2015 & 2018 NT Adult population

** p<0.01 Significant difference in percentage of gamblers by survey

Table 4 shows population counts for gambling status by survey and sex. There was a small increase in the NT population from 2015 to 2018 for men (260 men), and a large decline in the number of men gambling (4,092 men). For women, there was a large increase in population (3,780 women), and a decrease in women gamblers (965 women). So, in 2018 there were 5,057 less gamblers in the NT, compared with 2015, and an increase in non-gamblers (of 9,097 adults).

Table 4: Gambling status by survey, 2015 and 2018 NT Adult population

	Males			Females			NT Adults		
	2018 N	2015 N	Diff. N	2018 N	2015 N	Diff. N	2018 N	2015 N	Diff. N
Not gamble	26,564	22,212	4,352	24,925	20,180	4,745	51,489	42,392	9,097
Gamble	66,302	70,394	-4,092	63,165	64,130	-965	129,467	134,524	-5,057
NT Adults	**92,866**	**92,606**	**260**	**88,090**	**84,310**	**3,780**	**180,956**	**176,916**	**4,040**

Given the change in the prevalence of gambling in the NT adult population for both men and women, figures presented forthwith will be percentage estimates for the gambler population only, unless labelled otherwise.

3.1.2 Change in problem gambling risk, 2015 to 2018

Figure 2 shows that the percentage of gamblers being classified as at-risk of problem gambling increased significantly between 2015 and 2018 from 15.4% to 20%, and this equated to an additional 5,135 gamblers in the NT classified as at-risk of problem gambling (Table 5).

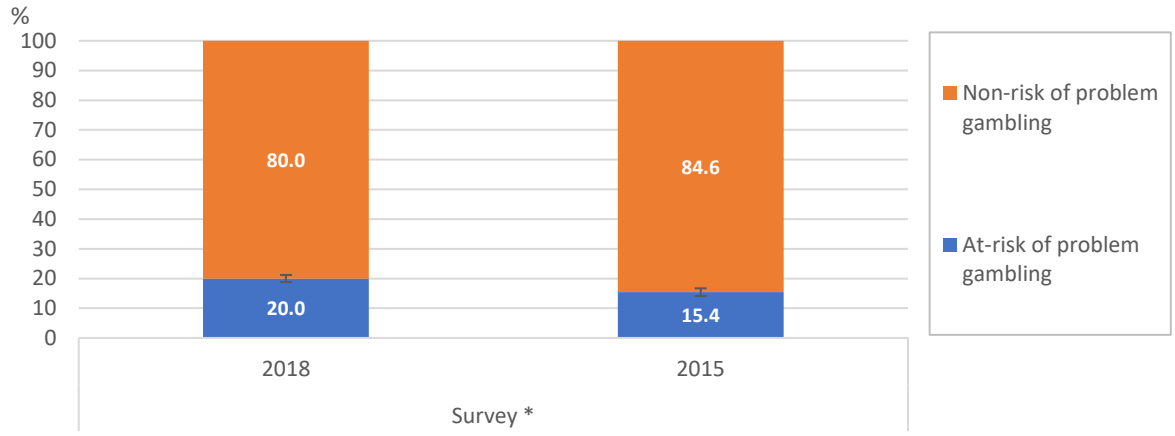

Figure 2: At-risk of problem gambling by survey, 2015 & 2018 gamblers

* p<0.05 Significant difference in percentage of at-risk gamblers by survey

Table 5: At risk of problem gambling by survey, 2015 and 2018 gamblers

	2018 N	2015 N	Difference N
At-risk of problem gambling	25,852	20,717	5,135
Non-risk of problem gambling	103,616	113,807	-10,191
Non-gambler	51,489	42,392	9,097
NT Adults	**180,956**	**176,916**	4,040

Figure 3 shows that the percentage at-risk gamblers increased significantly for all categories of the Problem Gambling Severity Index (PGSI) from 2015 to 2018. Specifically, problem gambling more than doubled from 0.9% to 1.9% of all gamblers or about one in 50 gamblers. Table 6 shows that there were an additional 1,281 gamblers experiencing problem gambling in 2018, compared with 2015. From 2015 to 2018, moderate risk problem gambling increased from 3.8% (5,128 gamblers) to 5% (6,426 gamblers), while low risk problem gambling increased from 10.7% (14,383 gamblers) to 13.1% (16,938 gamblers) of gamblers.

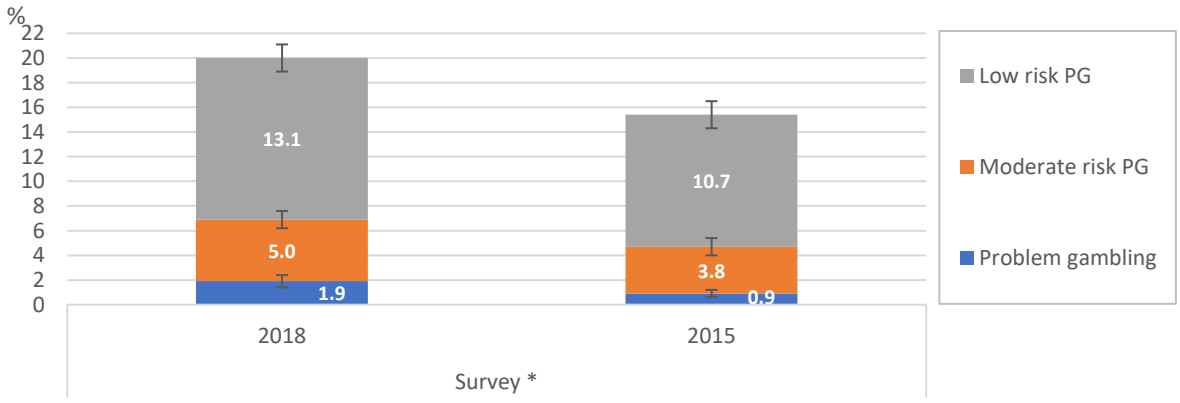

Figure 3: Problem gambling risk group by survey, 2015 & 2018 gamblers

* p<0.05 Significant difference in distribution in problem gambling risk by survey

Table 6: Problem gambling risk (PGSI) by survey, 2015 and 2018 gamblers

	2018 N	2015 N	Difference N
Problem gambling	2,487	1,206	1,281
Moderate risk problem gambling	6,426	5,128	1,298
Low risk problem gambling	16,938	14,383	2,555
Non-problem gambling	103,616	113,807	-10,191
NT Gamblers	**129,467**	**134,524**	**-5,057**

All at-risk gamblers were asked about negative consequences (harms) arising from their gambling from a list of 16-18 consequences (harms). The next sections present estimates for harms from own gambling for at-risk gamblers.

3.1.3 Harm from own gambling by survey

In 2015, 25% of at-risk gamblers endorsed at least one harm from the list of twenty harms, and this significantly increased to 43.8% in 2018. Table 7 shows that this increase equated to 11,335 at-risk gamblers experiencing at least one harm from their gambling in 2018; an increase of 6,165 in three years, since the 2015 survey.

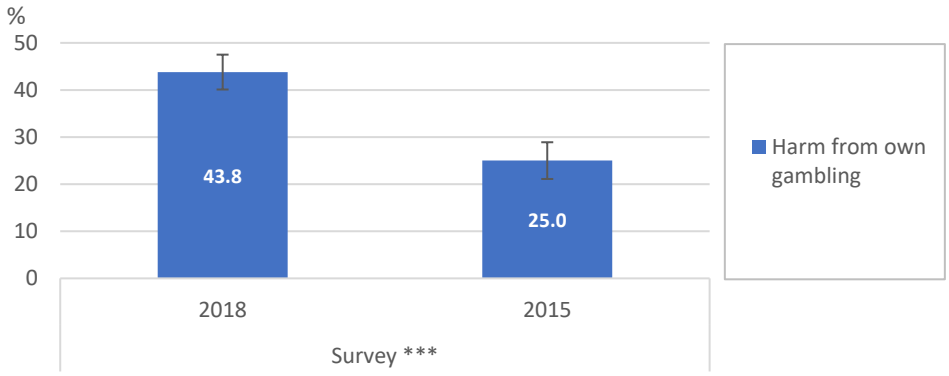

Figure 4: Harm from own gambling by survey, 2015 & 2018 at-risk gamblers

*** p<0.001 Significant difference in own gambling harm by survey, at-risk gamblers

Table 7: Harm from own gambling by survey, 2015 and 2018 at-risk gamblers

	2018 N	2015 N	Difference N
None	14,517	15,547	-1,030
Harm from own gambling	11,335	5,170	6,165
Total	**25,852**	**20,717**	**5,135**

3.1.4 Number of harms from own gambling

Figure 5 shows the distribution of the number of own gambling harms for at-risk gamblers by survey (left two bars), and the distribution of number of harms for at-risk gamblers endorsing one or more harms. The distribution of number of harms was significantly different in 2018, compared with 2015 for at -risk gamblers, with the largest difference being in the percentage of at-risk gamblers not endorsing any of the harms (75% in 2015 *cf*. 44% in 2018). In 2018, of the at-risk gamblers endorsing at least one harm, 73.7% endorsed one or two harms, 8.4% three or four, 6.3% five or six, 6.6% seven or eight, and 5% nine or more of the twenty harms. This equates to around 2,000 gamblers experiencing five or more harms from their gambling in 2018 (see Table 8).

The 2015 distribution for number of harms differed to 2018, in that a larger percentage of gamblers endorsed three or four harms (25% *cf*. 8.4%) and seven to eight harms (12.5% *cf*. 6.6%).

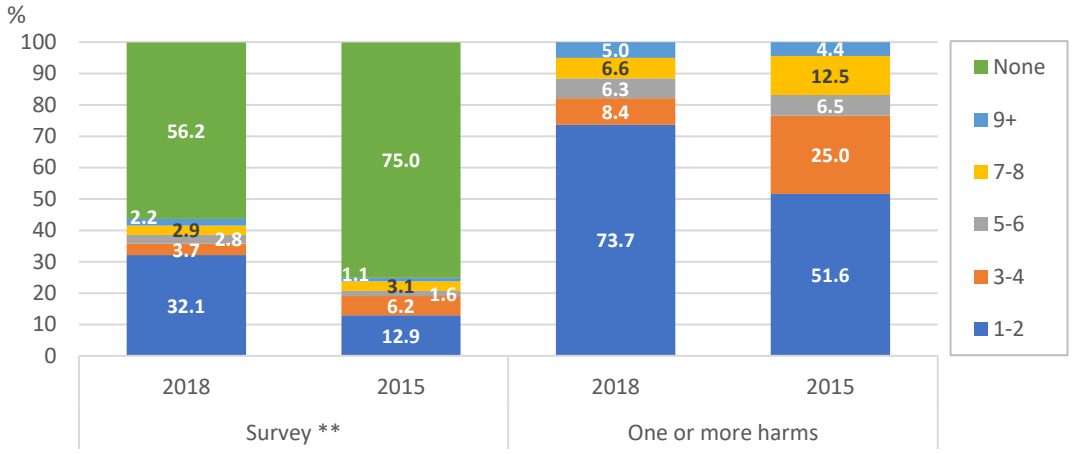

Figure 5: Number of harms from own gambling by survey, 2015 & 2018 at-risk gamblers

** p<0.01 Significant difference in distribution of number of own gambling harms by survey

3.1.5 Number of harms from own gambling and problem gambling risk

Figure 6 shows the significant association between problem gambling risk and number of harms from own gambling. In 2018, 100% of gamblers classified as at risk of problem gambling endorsed one or more of the twenty harms, compared with 68% for moderate risk problem gambling and 27% of low risk problem gambling gamblers. In the problem gambling group 33% endorsed one or two harms, while 28.6% and 6.2% endorses seven to eight and nine or more harms respectively. That is, 35% (865 gamblers) of gamblers at high risk of problem gambling experienced seven or more harms from their own gambling, compared with around 7% of gamblers at moderate risk of problem gambling, and no low risk gamblers. In the low risk problem gambling group, 25% endorsed one or two harms, 1.2% three or four harms and just 0.2% five or six harms.

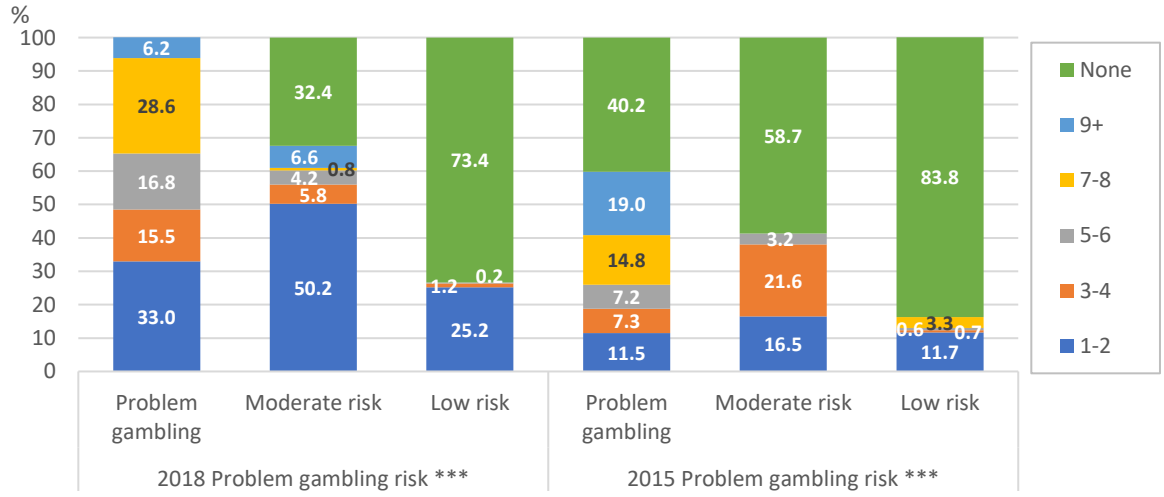

Figure 6: Problem gambling risk by number of own harms, 2015 & 2018 at-risk gamblers

*** p<0.001 Significant difference in number of own harms by problem gambling risk

Table 8: Number of harms because of own gambling, 2015 and 2018 at-risk gamblers

	2018 Problem gambling risk ***				2015 Problem gambling risk ***			
	Problem Gambling N	Moderate Risk N	Low Risk N	Total N	Problem Gambling N	Moderate Risk N	Low Risk N	Total N
None	0	2,082	12,435	14,517	485	3,009	12,053	15,547
1-2	820	3,227	4,262	8,309	138	846	1,680	2,665
3-4	384	375	206	965	88	1,110	96	1,294
5-6	419	268	35	721	87	163	85	335
7-8	711	51	0	761	178	0	469	647
9+	154	425	0	578	229	0	0	229
Total	**2,487**	**6,426**	**16,938**	**25,852**	**1,206**	**5,128**	**14,383**	**20,717**

*** p<0.001 Significant difference in number of own harms by problem gambling risk

3.1.6 Types of harms from own gambling

Not all harms measured in the 2018 survey were directly comparable with the harms collected in the 2015 survey. Figure 7 shows comparable harms between 2015 and 2018 surveys, while Table 9 shows estimates and population counts. Note that estimates in Figure 7 and Table 9 comparing 2015 and 2018 data may vary slightly from estimates produced in later figures and tables due to missing data in either 2015 or 2018 surveys. The estimate for debt collectors repossessing goods was the only harm to differ significantly between 2015 and 2018, with a decrease from 3.3% of at-risk gamblers to 0.3%. however, as was seen in the previous sections, a greater percentage of at-risk gamblers identified at least one harm, increasing from 25% in 2015 to 44% in 2018.

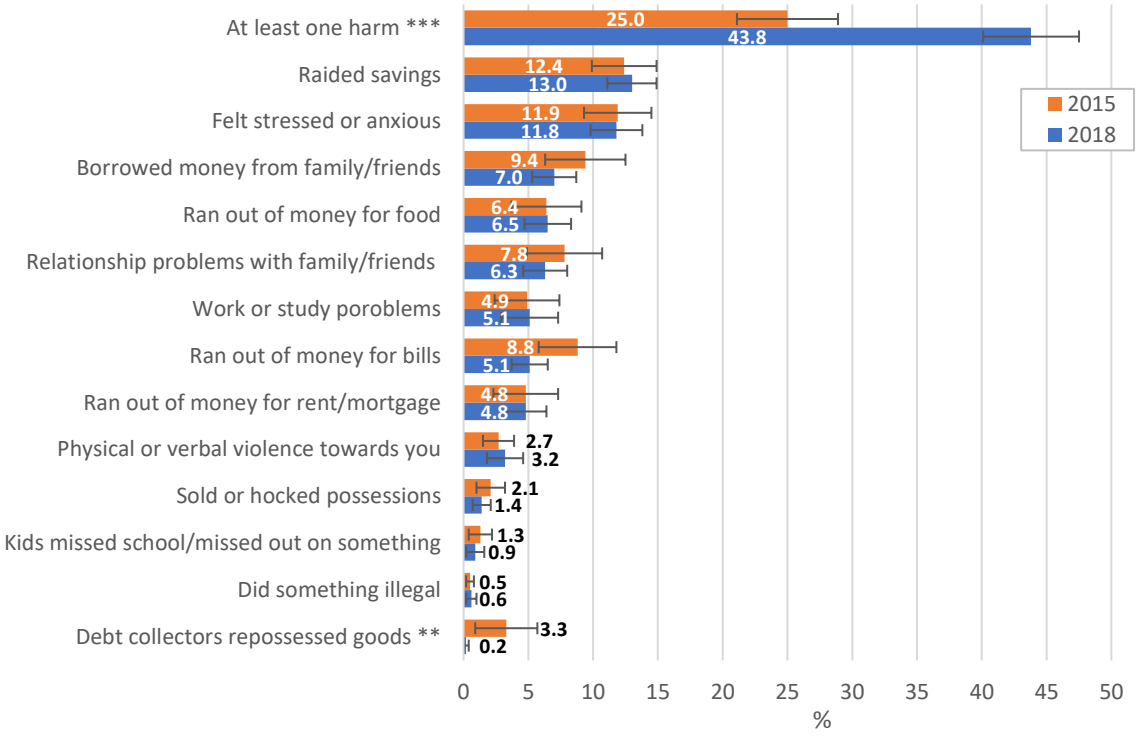

Figure 7: Type of harm from own gambling by survey, 2015 & 2018 at-risk gamblers

*** p<0.001, ** p<0.01 Significant difference in percentage between surveys

Table 9: Harms because of own gambling by survey, 2018 and 2015 NT at-risk gamblers

	Survey			
	2018 % (SE)	2015 % (SE)	2018 N	2015 N
One or more harms from own gambling ***	43.8 (3.7)	25.0 (3.9)	11,335	5,170
Raided savings accounts/funds	13.0 (1.9)	12.4 (2.5)	3,349	2,566
Felt stressed or anxious	11.8 (2.0)	11.9 (2.6)	3,061	2,475
Borrowed money from family or friends	7.0 (1.7)	**9.4 (3.1)**	1,798	1,957
Ran out of money for food	6.5 (1.8)	**6.4 (2.7)**	1,678	1,326
Relationship problems close friends or family	6.3 (1.7)	**7.8 (2.9)**	1,463	1,613
Ran out of money for other bills (e.g. electricity)	5.1 (1.4)	**8.8 (3.0)**	1,319	1,824
Work or study problems (e.g. absenteeism, lost job)	**5.1 (2.2)**	**4.9 (2.5)**	1,318	1,018
Ran out of money for rent/mortgage	**4.8 (1.6)**	**4.8 (2.5)**	1,240	1,002
Physical or verbal violence toward you	**3.2 (1.4)**	**2.7 (1.2)**	832	559
Sold or hocked possessions	**1.4 (0.7)**	**2.1 (1.1)**	362	434
Children did not attend school/missed out on something	**0.9 (0.7)**	**1.3 (0.9)**	54	280
Did something outside the law/illegal	**0.6 (0.4)**	**0.5 (0.3)**	160	100
Debt collectors repossessed goods **	**0.2 (0.2)**	**3.3 (2.4)**	54	676

*** p<0.001, ** p<0.01 Significant difference in percentage between surveys

Table 10 shows the percentage, population (N), and sample size (n) for each type of harm for at-risk gamblers, while Figure 8 plots the percentage of at-risk gamblers endorsing each harm from least to most prevalent. Around 11,000 or 44% of at-risk gamblers identified at least one harm because of their own gambling. Estimates of harms because of own gambling have high standard errors once the estimate drops below 5% (approximately 1300 adults) and should be interpreted with caution.

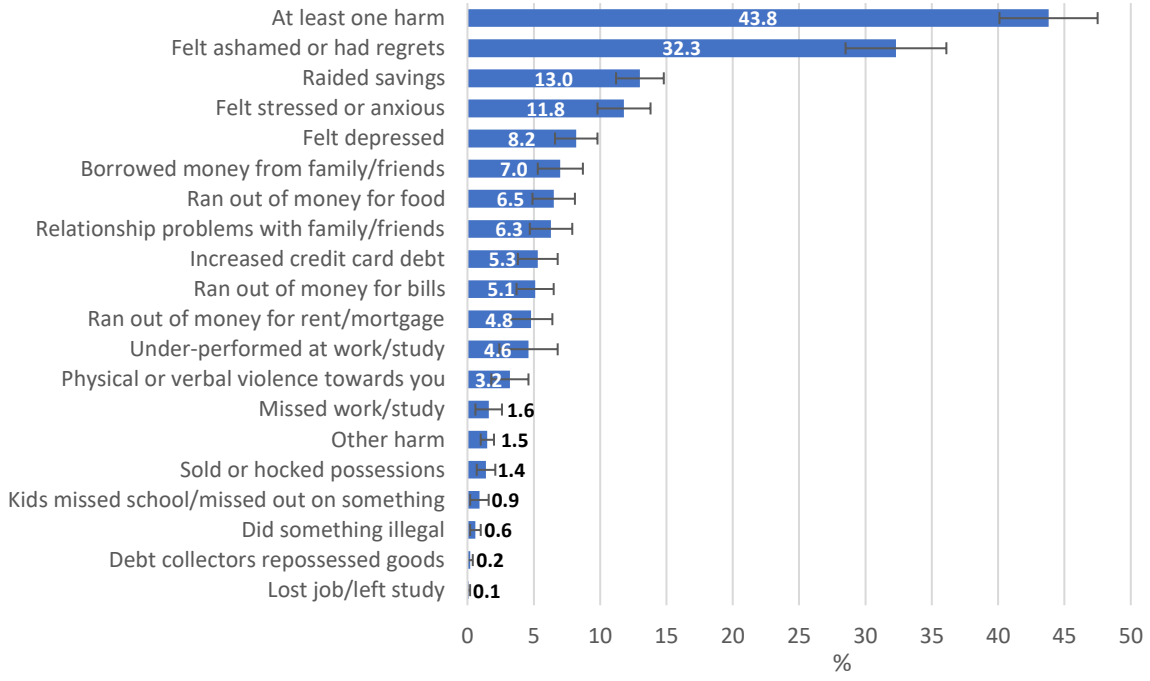

Figure 8: Type of harms because of own gambling, 2018 at-risk gamblers

Felt ashamed or had regrets was the most endorsed harm, with nearly one third (8,300 adults) of at-risk gamblers endorsing this harm. This was followed by raiding savings (13%), feeling stressed or anxious (12%), and feeling depressed (8%). So, three out of

the top four endorsed harms were in the emotional/psychological domain, followed by harms relating to financial harms. Under-performing at work (4.6%) was the most endorsed work-study related harm, while borrowing money from family/friends was the most endorsed relationship/family domain harm.

Table 10: Type of harms because of own gambling, 2018 at-risk gamblers

Domain	Type of harm	% (SE)	N	n
-	At least one harm	43.8 (3.7)	11,335	197
Emotional/psychological	Felt ashamed or had regrets	32.4 (3.8)	8,340	136
Financial	Raided savings	13.3 (1.8)	3,349	71
Emotional/psychological	Felt stressed or anxious	12.1 (2.0)	3,061	65
Emotional/psychological	Felt depressed	8.2 (1.6)	2,121	45
Relationship/family	Borrowed money from family/friends	7.0 (1.7)	1,798	28
Financial	Ran out of money for food	6.5 (1.6)	1,678	20
Relationship/family	Relationship problems with family/friends	5.7 (1.7)	1,463	22
Financial	Increased credit card debt	5.4 (1.5)	1,376	26
Financial	Ran out of money for bills	5.1 (1.4)	1,319	29
Financial	Ran out of money for rent/mortgage	**4.8 (1.6)**	1,240	15
Work/study	Under-performed at work/study	**4.6 (2.2)**	1,197	11
Relationship/family	Physical or verbal violence towards you	**3.2 (1.4)**	832	8
Work/study	Missed work/study	**1.6 (1.0)**	408	5
Financial	Sold or hocked possessions	**1.4 (0.7)**	362	7
Criminal	Did something illegal	**0.6 (0.4)**	160	3
Financial	Debt collectors repossessed goods	**0.2 (0.2)**	54	1
Relationship/family	Kids missed school/missed out on something	**0.2 (0.2)**	54	1
	Total at-risk gamblers	**100.0**	**25,852**	**514**

NOTES: **Bold font** indicates relative standard error greater than 30%

3.1.7 Frequency of harm because of own gambling

Table 11 presents estimates of frequency of occurrence for each own gambling harm for at-risk gamblers sorted by overall prevalence for all at-risk gamblers, while Figure 9 shows the frequency of the harm for those at-risk gamblers endorsing the harm sorted by weekly frequency. The three harms relating to emotional/psychological domain had the highest weekly endorsement with feeling ashamed or having regrets having the highest weekly occurrence (5% or 1,300 adults), followed by feeling stressed or anxious (4.1% or 1,050 adults), and feeling depressed (2.4% or 630 adults). Other harms were also endorsed at a higher weekly rate than other harms, with most of these text responses relating to being unable to control/stop their gambling, feeling regret and wishing that there was less accessibility to gambling products.

Table 11: Type and frequency of harms because of own gambling, 2018 at-risk gamblers

Type of harm	Weekly % (SE)	Monthly % (SE)	Less than Monthly % (SE)	Total % (SE)	Week-ly N	Month-ly N	Less than Month-ly N	Total N
At least one harm	-	-	-	43.8 (3.7)	-	-	-	14,517
Felt ashamed or had regrets	5.0 (1.9)	16.8 (3.3)	10.5 (2.3)	32.3 (3.8)	1,292	4,344	2,719	8,355
Raided savings	1.3 (0.5)	7.3 (1.4)	4.3 (1.0)	13.0 (1.8)	345	1,887	1,117	3,349
Felt stressed or anxious	4.1 (1.3)	5.9 (1.5)	1.9 (0.6)	11.8 (2.0)	1,053	1,517	491	3,061
Felt depressed	2.4 (0.9)	3.0 (1.0)	2.7 (1.1)	8.2 (1.6)	632	788	702	2,122
Borrowed money from family/friends	0.3 (0.3)	3.7 (1.5)	3.0 (0.9)	7.0 (1.7)	68	948	782	1,798
Ran out of money for food	0.3 (0.2)	4.3 (1.3)	1.8 (1.0)	6.5 (1.6)	79	1,124	476	1,679

Type of harm	Weekly % (SE)	Monthly % (SE)	Less than Monthly % (SE)	Total % (SE)	Week-ly N	Month-ly N	Less than Month-ly N	Total N
Relationship problems with family/friends	0.8 (0.7)	3.7 (1.4)	1.7 (1.0)	6.3 (1.6)	214	960	451	1,625
Increased credit card debt	0.5 (0.3)	2.5 (1.0)	2.4 (1.0)	5.3 (1.5)	122	639	615	1,376
Ran out of money for bills	0	3.3 (1.3)	1.8 (0.5)	5.1 (1.4)		844	474	1,318
Ran out of money for rent/mortgage	0.2 (0.2)	2.6 (1.3)	2.0 (1.0)	**4.8 (1.6)**	54	672	514	1,240
Under-performed work/study	0.4 (0.4)	1.4 (0.8)	2.8 (2.0)	**4.6 (2.2)**	101	362	733	1,196
Physical or verbal violence towards you	0	0.6 (0.4)	2.6 (1.3)	**3.2 (1.4)**	0	162	671	833
Missed work/study	0	0.7 (0.4)	0.9 (0.9)	**1.6 (1.0)**	0	176	231	407
Other harm	1.0 (0.5)	0.5 (0.3)	0	**1.5 (0.5)**	248	141	7	396
Sold or hocked possessions	0.2 (0.2)	0	1.2 (0.7)	**1.4 (0.7)**	54		309	363
Kids missed school/missed out on something	0.2 (0.2)	0.7 (0.7)	0	**0.9 (0.7)**	54	169	0	223
Did something illegal	0.2 (0.2)	0.2 (0.2)	0.2 (0.2)	**0.6 (0.4)**	54	56	51	161
Debt collectors repossessed goods	0	0	0.2 (0.2)	**0.2 (0.2)**	0	0	54	54
Lost job/left study	0	0	0.1 (0.1)	**0.1 (0.1)**	0	0	25	25

Notes: Category of no harm for each harm not included in table

Figure 9 shows the distribution of frequency within each harm, only for those endorsing the harm. Of those 1.5% of at-risk gamblers endorsing an "other" type of harm not listed, more than 60% indicated that it occurred weekly. By observing frequency of occurrence of individual harms, it is apparent that some of the more serious types of harms, such as doing something illegal or children missing out on things, have relatively high weekly frequency, with 34% of at-risk gamblers endorsing that they did something illegal, were doing it weekly, while for children missing out on something, 24% indicated this happened weekly. Feeling stressed or anxious, as well as being the most endorsed harm, was also the most commonly occurring harm, with 34% indicating they felt like this weekly.

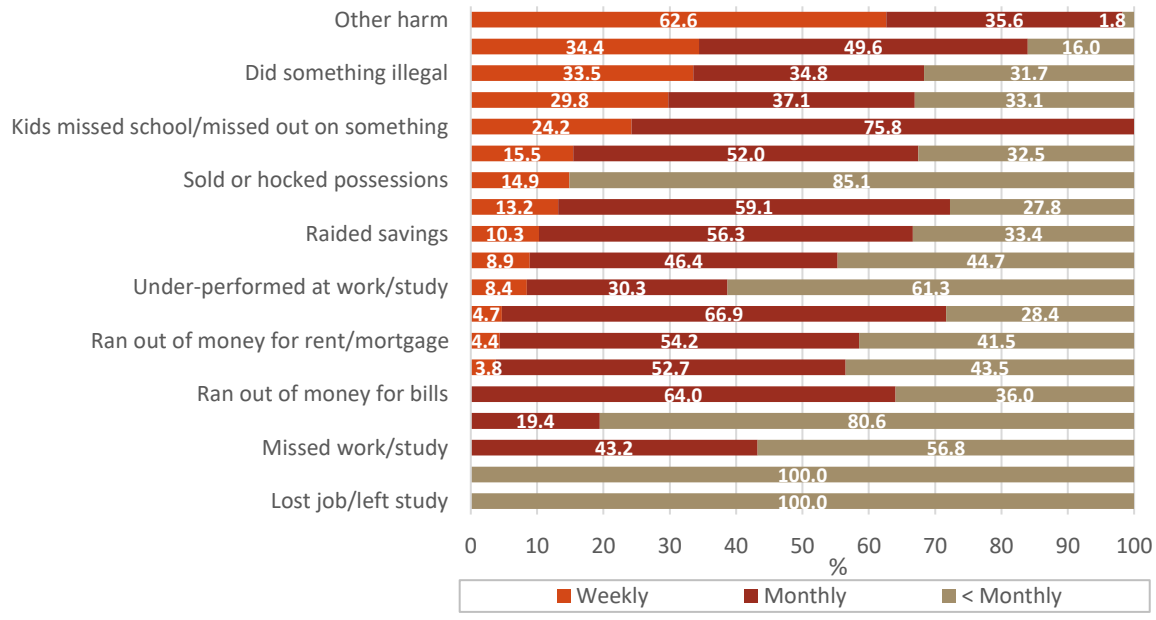

Figure 9: Type of harms because of own gambling, 2018 at-risk gamblers

3.1.8 Exploratory Factor Analysis of own gambling harms

Table 12 shows the results from the weighted factor analysis of own gambling harms incidence for at-risk gamblers. Own gambling harms where prevalence was less than 0.5% of the weighted sample were excluded due to not enough variation across the sample. Four factors were extracted explaining 71% of the variation across the 16 harms included in the factor analysis. Factor one explained 31% of the variation in the 16 harms and was predominantly represented by financial harms, but includes one harm from relationships/family domain, children missing out on school or something, and the one criminal harm, did something illegal. These two non-financial harms were endorsed at low rates (0.9% and 0.6% respectively), and while only affecting a small number of at-risk gamblers, could be considered serious harms with a high impact on family and community. Factor two explained 17% of the variation and was represented by three harms from the relationship/family domain, and one from the financial domain, ran out of money for bills. So, this factor captures all relationship/family harms, except children missing out on school or something. Factor three explained 14% of the variation and contained the three harms in the emotional/psychological domain, felt stressed or anxious, felt depressed and felt ashamed or had regrets. Lastly, factor four explained 9% of the variation and contained the harms from the work/study domain, under-performed at work and missed work/study or lost a job/dropped out of study (merged items).

The extracted factors (one and two) show that financial harms are inter-related with other harm domains, particularly the relationship/family domain, but also the criminal domain. However, the financial harm, ran out of money for rent/mortgage, also loaded highly on factor two, while increased credit card debt also loaded highly on factor four, showing it relationship with work/study harms. This is unsurprising and should be expected as financial stress is strongly associated with family/relationship problems including arguments, borrowing money and general relationship problems with family or friends.

Table 12: Exploratory factor analysis of harms from own gambling, 2018 at-risk gamblers

Domain	Type of harm	F1	F2	F3	F4	Prevalence %
Relationship/family	Children missed school/out on something	**0.98**	-0.04	-0.01	0.00	0.9 (0.7)
Financial	Ran out of money for food	**0.97**	0.15	0.02	0.07	6.5 (1.6)
Criminal	Did something illegal	**0.96**	-0.05	-0.02	-0.01	0.6 (0.4)
Financial	Sold/hocked/repossessed possessions	**0.95**	0.12	-0.02	-0.03	1.4 (0.7)
Financial	Ran out of money for rent/mortgage	**0.71**	**0.46**	0.02	-0.02	4.8 (1.6)
Financial	Increased credit card debt	**0.56**	0.13	0.17	**0.47**	5.3 (1.5)
Financial	Raided savings	**0.55**	0.24	0.21	0.14	13.0 (1.8)
Financial	Ran out of money for bills	**0.32**	**0.82**	0.03	-0.05	5.1 (1.4)
Relationship/family	Borrowed money from family/friends	0.02	**0.78**	0.07	0.16	7.0 (1.7)
Relationship/family	Relationship problems with family/friends	0.04	**0.72**	0.14	0.20	6.3 (1.6)
Relationship/family	Physical or verbal violence towards you	-0.02	**0.71**	0.09	0.14	3.2 (1.4)
Emotional/psychological	Felt stressed or anxious	0.00	0.11	**0.94**	0.02	11.8 (2.0)
Emotional/psychological	Felt depressed	0.00	0.03	**0.94**	0.05	8.2 (1.6)
Emotional/psychological	Felt ashamed or had regrets	-0.01	0.02	**0.69**	-0.03	32.3 (3.8)
Work/study	Under-performed at work/study	-0.02	0.14	0.06	**0.82**	4.6 (2.2)
Work/study	Missed work/study or lost job/study	-0.01	0.13	-0.05	**0.57**	1.6 (1.0)
-	Eigen values (rotated)	4.96	2.68	2.36	1.34	-
-	Cumulative variation explained	31%	48%	62%	71%	-

Notes: Loadings in **black bold font** greater than 0.40, and **red bold font** between 0.30 and 0.40

In addition to conducting a factor analysis on individual own gambling harms, a factor analysis was also carried out using incidence of own gambling harm domains. Table 13 shows two clear factors that explained 76% of the variation across the initial five harm domains. Factor 1 represents relationship/family, financial and criminal domains, while factor 2 represents work/study and emotional/psychological domains. Given that weighting in both factors are very similar, these domains were added to create two composite harm domains. These were then used to assess associations between gambling activities and factor incidence rates.

Table 13: Exploratory factor analysis of harm domains from own gambling, 2018 at-risk gamblers

Variable	Factor1	Factor2	Prevalence	Incidence rate PPPY
Relationship/family	**0.97**	-0.06	6.5 (1.6)	2.2
Financial	**0.94**	0.07	21.0 (2.4)	8.3
Criminal	**0.93**	-0.19	0.6 (0.4)	0.1
Work/study	0.14	**0.72**	5.1 (2.2)	1.0
Emotional/psychological	0.09	**0.72**	35.7 (3.7)	11.6
Eigen values (rotated)	2.71	1.11	-	-
Cumulative variation explained	54.2%	76.3%	-	-

Notes: Loadings in **black bold font** greater than 0.40

3.1.9 Incidence of own gambling harm domains for all at-risk gamblers

Figure 10 and Table 14 show the distribution of gambling harms by domains for 2018 at-risk gamblers, with the latter also showing the population of at-risk gamblers and the incidence rate per person per year (PPPY). Emotional/psychological harms were the largest of the five domains, making up 50% of all own gambling harms of at-risk gamblers, followed by financial (36%), relationship/family (9%), work/study (4%) and criminal (1%). So, even though emotional/psychological harms were made up of just three individual harms (see Table 3), compared with seven for financial and four for relationship/family domains, at-risk gamblers endorsed emotional/psychological types of harms as occurring the most.

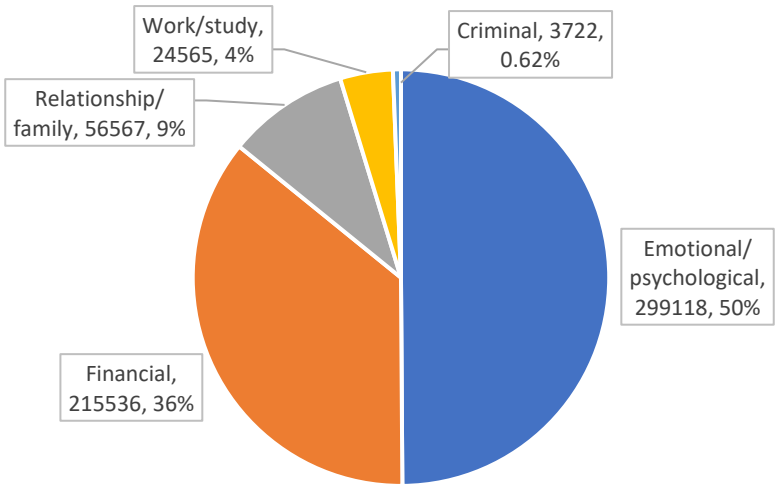

Figure 10: Distribution of incidence of own gambling harms by domain, 2018 at-risk gamblers

Table 14 shows the incidence of own harms, at-risk gamblers population and the incidence rate per person per year (PPPY) by harm domains. Across all at-risk gamblers the highest incidence rate PPPY occurred for emotional/psychological harms (11.6), followed by financial (8.3), relationship/family (2.2), work/study (1.0) and criminal (0.1). when applying incidence rates to the harmed population for a specific domain, there is a large increase, with financial harms having the highest incidence rate per person per year (39.7), followed by relationship/family (33.7). emotional/psychological (32.4), criminal (23.3) and work/study (18.6).

Table 14: Incidence, adult population, and incidence rate per person per year by own gambling harm domain, 2018 at-risk gamblers

	Incidence	Percentage	At-risk Population N	At-risk: Incidence rate PPPY	Harmed population N	Harmed: Incidence rate PPPY
Emotional/psychological	299,118	49.9	25,852	11.6	9,235	32.4
Financial	215,536	36.0	25,852	8.3	5,425	39.7
Relationship/family	56,567	9.4	25,852	2.2	1,680	33.7
Work/study	24,565	4.1	25,852	1.0	1,318	18.6
Criminal	3,722	0.6	25,852	0.1	160	23.3
Total harms	**599,508**	**100.0**	**25,852**	**23.2**	**11,335**	**52.9**

Notes: PPPY = per person per year

The next section presents incidence rates by problem gambling risk to highlight how higher problem gambling risk is associated with higher incidence rates PPPY of harms.

3.1.10 Incidence of own gambling harm domains by problem gambling risk

Figure 11 shows the distributions of harms by domains for problem gambling risk categories. Both the emotional/psychological and financial harm domains consistently made up around 50% and 35% respectively of the incidence of harms for each category of problem gambling risk. Incidence of work/study harms made up a larger proportion of harms in the low (9.2%) and moderate risk (7.1%) gamblers, compared with high risk gamblers (2%). Criminal harms made up a slightly larger proportion of the incidence of harms for low risk (1.3%), compared with moderate risk (0.1%) and high risk (0.7%) gamblers.

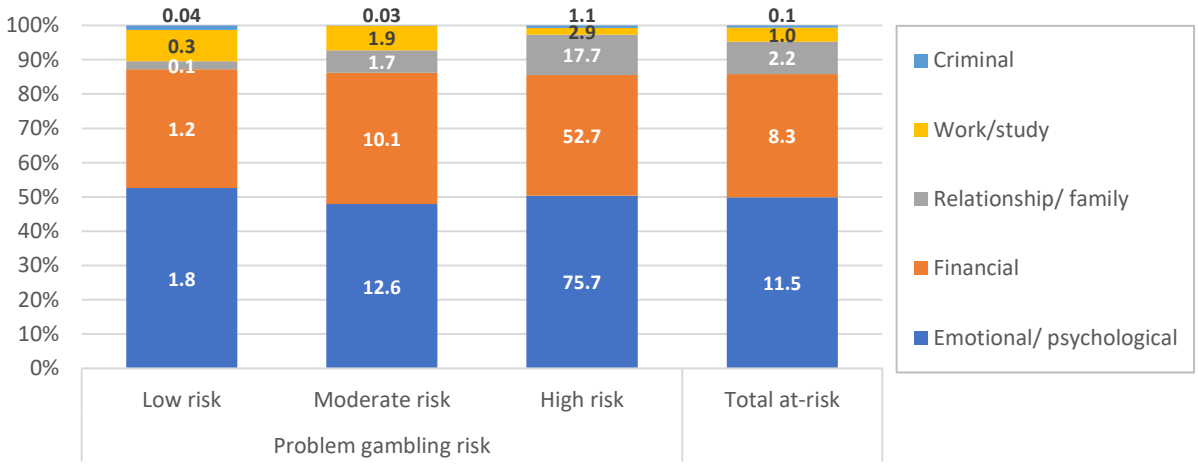

Figure 11: Distribution incidence rate of harms for problem gambling risk by domain (incidence rate PPPY shown), 2018 at-risk gamblers

Figure 12 and Table 15 present incidence rates PPPY for problem gambling risk categories by gambling harm domains, with Table 14 also presenting harm rate ratios (95% CI) from bivariate negative binomial regressions. There is a strong positive association between increasing problem gambling risk and increasing incidence rates PPPY for all domains of harm, with a significant association for all domains except work/study. Emotional/psychological harms incidence rate per person per year for gamblers at low risk of problem gambling was 1.8, increasing to 12.6 for moderate risk and 75.7 for high risk gamblers. Financial harms incidence rate per person per year for gamblers at low risk of problem gambling was 1.2, increasing to 10.1 for moderate risk and 52.8 for high risk gamblers. There was a drop in incidence rates for the other three harm domains. For relationship/family harms the incidence rate per person per year for gamblers at low risk of problem gambling was 0.1, increasing to 1.7 for moderate risk and 17.7 for high risk gamblers. For work/study harms the incidence rate per person per year for gamblers at low risk of problem gambling was 0.3, increasing to 1.9 for moderate risk and 2.9 for high risk gamblers. Lastly, for criminal the incidence rate per person per year for gamblers at low risk of problem gambling was 0.04, decreasing to 0.03 for moderate risk and increasing to 1.1 for high risk gamblers.

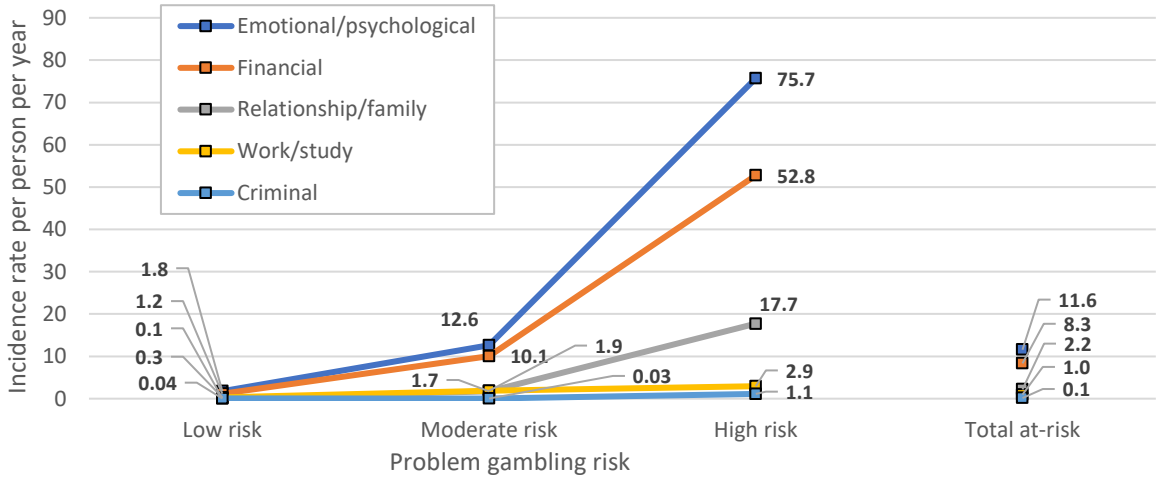

Figure 12: Problem gambling risk by own harm domains incidence per person per year, 2018 at-risk gamblers

Table 15: Problem gambling risk by own harm domains, incidence per person per year, harm rate ratios and population, 2018 at-risk gamblers

	Domains: Incidence rate per person per year					
PG Risk	**Emotional/ Psychological**	**Financial**	**Relationship/ family**	**Work/study**	**Criminal**	**Population N**
Low risk	1.8	1.2	0.1	0.3	0.04	16,938
Moderate risk	12.6	10.1	1.7	1.9	0.03	6,426
High risk	75.7	52.8	17.7	2.9	1.1	2,487
Total at-risk	**11.6**	**8.3**	**2.2**	**1.0**	**0.1**	**25,852**
	Domains: Harm Rate Ratios (95% CI)					
Low risk	1.0	1.0	1.0	1.0	1.0	-
Moderate risk	**7.13 (2.50-20.3)**	**8.63 (4.16-17.9)**	**22.49 (3.78-133.)**	6.03 (0.72-50.5)	0.74 (0.05-12.0)	-
High risk	**42.82 (17.8-103)**	**45.26 (19.3-106)**	**228.91 (43.1-1216)**	9.49 (0.84-107)	**26.29 (1.62-427)**	-
Significance	***	***	***	p=0.17	*	-

*** p<0.001, * p<0.05 Significant association between problem gambling risk and harm domain incidence (negative binomial regression)

Figure 13 is included here to show that the incidence rate of own gambling harms across all domains increases as problem gambling risk increases over and above the cut-off of eight on the PGSI, the problem gambling cut. The incidence rate PPPY for emotional/psychological harms is 47.6 in the high risk (scores 8-13), and then jumps to 146.1 in the very high risk of problem gambling category, using a cut of 14 or more. A similarly large jump is also observable for financial harms, with the incidence rate PPPY jumping from 28.4 for high risk to 113.9 for very high risk gamblers, and again for relationship/family harms, increasing from 8.9 in the high risk problem gambling group to 39.8 in the very high risk problem gambling group. Lastly, for both work/study and criminal harms there was a large increase in incidence rate PPPY between high risk and very high-risk gamblers.

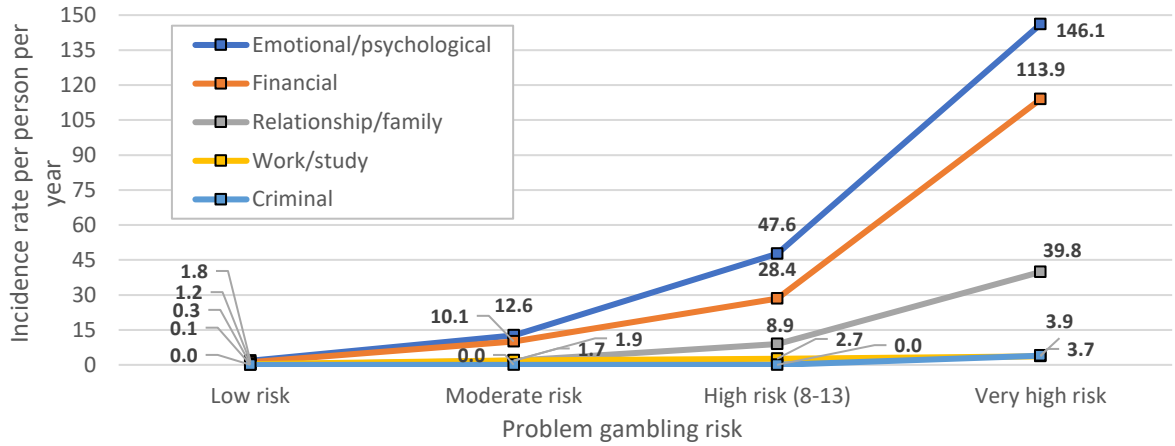

Figure 13: Problem gambling risk by harm domains incidence per person per year, 2018 at-risk gamblers

Figure 14 and Table 16 present incidence rates PPPY for problem gambling risk categories by composite harm domains, with Table 16 also presenting harm rate ratios (95% CI) from bivariate negative binomial regressions. There is a positive association for both composite harm domains with problem gambling risk with an increase in incidence rate PPPY between seven and nine-fold from low and moderate risk problem gambling and a five to six-fold increase from moderate risk to high risk of problem gambling.

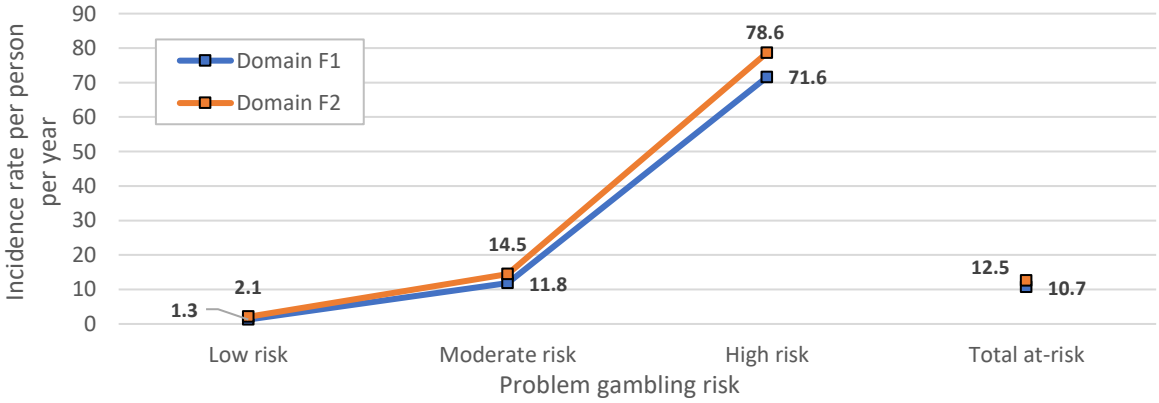

Figure 14: Problem gambling risk by composite own gambling harm domains[£] incidence per person per year, 2018 at-risk gamblers

[£] Domain F1 = Relationship/family + Financial + Criminal; Domain F2 = Emotional/psychological + Work/study

Table 16 shows incidence rates PPPY and incidence rate ratios from the negative binomial regression for problem gambling risk for the two composite harm domains.

Table 16: Problem gambling risk by composite harm domains[£], incidence per person per year, harm rate ratios and population, 2018 at-risk gamblers

	Domain factors[£]: Incidence rate per person per year		
PG Risk	**Domain F1**	**Domain F2**	**Population**
Low risk	1.3	2.1	16,938
Moderate risk	11.8	14.5	6,426
High risk	71.6	78.6	2,487
Total at-risk	**10.7**	**12.5**	**25,852**
	Domain factors: Incidence Rate Ratio (95% CI)		
Low risk	1.0	1.0	-
Moderate risk	**9.20 (4.34-19.5)**	**6.96 (2.72-17.8)**	-
High risk	**55.69 (22.8-136.)**	**37.85 (16.2-88.2)**	-
Significance	***	***	-

*** p<0.001 Significant association between problem gambling risk and domain factor incidence (negative binomial regression)

[£] Domain F1 = Relationship/family + Financial + Criminal; Domain F2 = Emotional/psychological + Work/study

Figure 15 is included to show that incidence rates for harms continue to increase beyond the eight cut-point used in the PGSI to designate problem gambling. From low to moderate risk problem gambling for the two composite harm domains there is an increase in incidence rate PPPY between seven and nine-fold, and between moderate risk to high risk there is a three to three and half-fold increase, while between high risk and very high risk problem gambling there is an increase of between three and four-fold for the two composite harm domains.

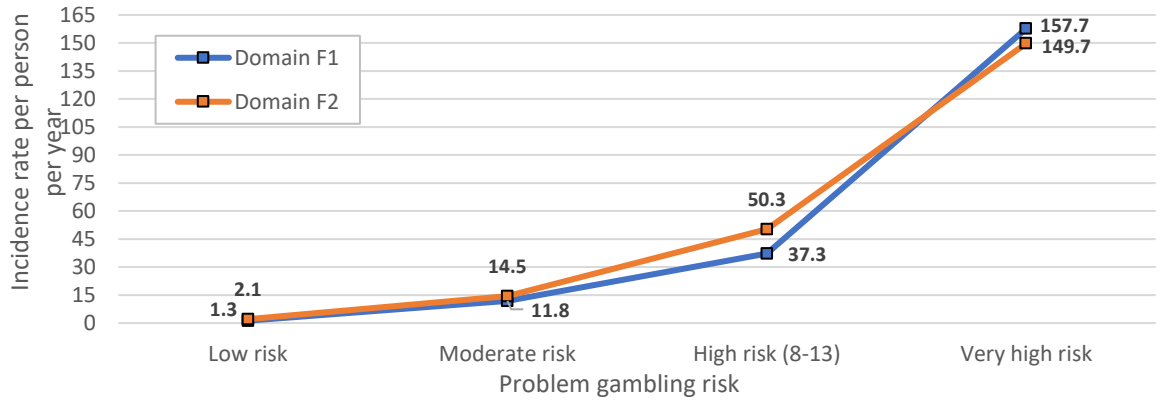

Figure 15: Problem gambling risk by composite harm domains[£] incidence per person per year, 2018 at-risk gamblers

[£] Domain F1 = Relationship/family + Financial + Criminal; Domain F2 = Emotional/psychological + Work/study

While the previous figures and tables showed the incidence rate (IR) PPPY across all at-risk gamblers, Figure 16 and Table 17 show the incidence rate for those that endorsed at least one harm from the domain. This shows the true incidence for those who were affected by the harm domain. Compared with IRs for the total at-risk gambling population, there IRs are higher, as not all at-risk gamblers across risk categories endorse a harm from each domain. IRs for high risk gamblers are like those

in Figure 16, as most high-risk gamblers endorsed at least one harm from each of the five domains. Further, it is not always the case in Figure 16 that the IR for a domain is higher as problem gambling risk increases. The work/study and criminal domains had with the lowest incidence rates when using the full at-risk gamblers population, but had a "U" shape when confining the population to those at-risk gamblers endorsing at least one harm from the domain, with a higher incidence rate for low risk, compared with moderate risk gamblers, then increasing again for high risk gamblers.

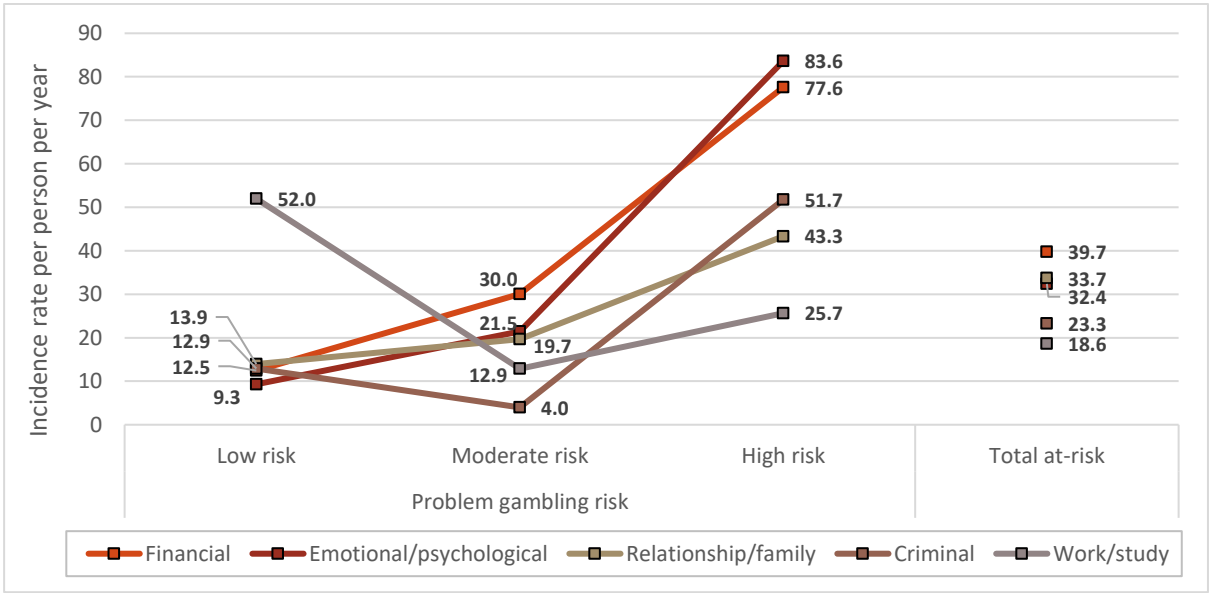

Figure 16: Problem gambling risk by composite harm domains[£] incidence per person per year for population endorsing at least one harm in the domain, 2018 at-risk gamblers

Table 17: Problem gambling risk by harm domains, incidence per person per year for population endorsing at least one harm in the domain, 2018 at-risk gamblers

	Incidence rate per person per year				
PG Risk	**Financial**	**Emotional/ psychological**	**Relationship/ family**	**Criminal**	**Work/study**
Low risk	12.5	9.3	13.9	12.9	52.0
Moderate risk	30.0	21.5	19.7	4.0	12.9
High risk	77.6	83.6	43.3	51.7	25.7
Total at-risk	**39.7**	**32.4**	**33.7**	**23.3**	**18.6**

The next section shows incidence rates for harm domains and composite domain factors by gambling frequency for more risky gambling activities. Incidence rates will only be presented for the total at-risk gamblers population.

3.1.11 Incidence of own gambling harm domains by selected gambling activity frequency

Figure 17 and Table 18 show incidence rates PPPY for EGM frequency by four gambling harm domains, with Table 18 also presenting harm rate ratios (95% CI) from bivariate negative binomial regressions (but not for criminal harms due to small numbers). There was a significant positive association between more regular gambling and increasing incidence rates for emotional/psychological, and financial harms. At-risk gamblers who did not gamble on EGMs had an incident rate PPPY of 4.1 for emotional/psychological harms, increasing to 4.4 for less than monthly gamblers, 27.8

for monthly EGM gamblers and 47.7 for weekly or more regular gamblers. Financial harms incidence rate for non-EGM gamblers was 4.1 PPPY, increasing to 6.9 for less than monthly EGM gamblers, 7.8 for monthly gamblers and 31.9 for weekly or more regular gamblers. The incidence rate for relationship/family harms for at-risk gamblers not gambling on EGMs was 1.4, decreasing to 1 for less than monthly gamblers, then increasing to 2.2 and 9.5 PPPY for monthly and weekly or more gamblers respectively. Work/study harms hovered between 0.4 and 1.3 PPPY across all EGM frequency categories, with this association non-significant.

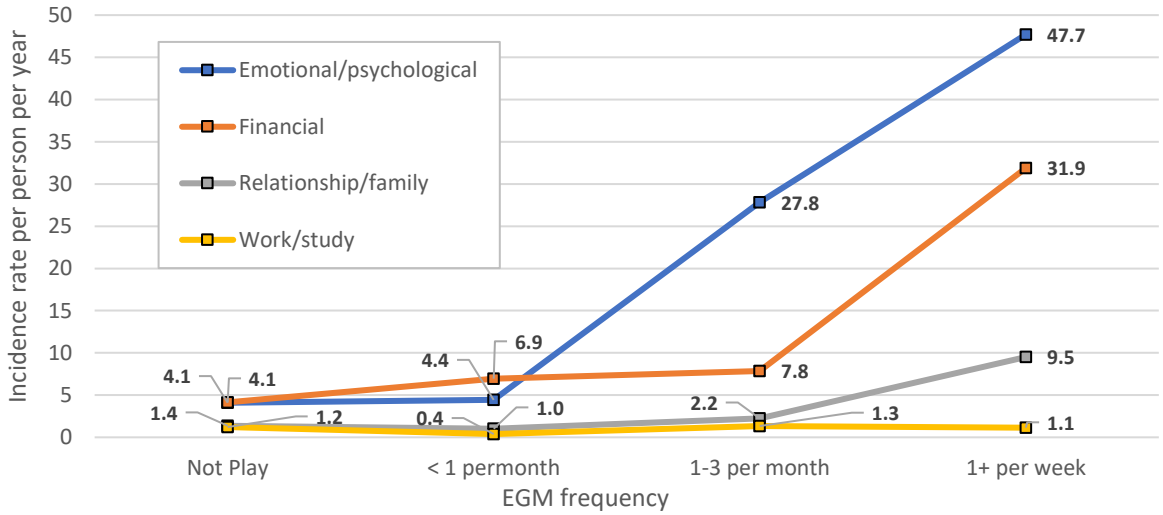

Figure 17: EGM frequency by harm domains incidence per person per year, 2018 at-risk gamblers

Table 18: EGM frequency by harm domains, incidence per person per year, harm rate ratios and population, 2018 at-risk gamblers

	Domains: Incidence rate per person per year					
EGMs	**Emotional/ Psychological**	**Financial**	**Relationship/ family**	**Work/study**	**Criminal**	**Population N**
Not play	4.1	4.1	1.4	1.2	0.1	11,579
< 1 per month	4.4	6.9	1.0	0.4	0.0	8,449
1-3 per month	27.8	7.8	2.2	1.3	0.1	3,195
1+ per week	47.7	31.9	9.5	1.1	1.1	2,629
Total at-risk	**11.6**	**8.3**	**2.2**	**1.0**	**0.1**	**25,852**
	Domains: Harm Rate Ratios (95% CI)					
Not play	1.0	1.0	1.0	1.0	-	-
< 1 per month	1.08 (0.49-2.38)	1.68 (0.54-5.26)	0.74 (0.14-4.01)	0.32 (0.06-1.65)	-	-
1-3 per month	**6.80 (2.55-18.2)**	1.89 (0.33-10.7)	1.63 (0.17-15.2)	1.10 (0.14-8.98)	-	-
1+ per week	**11.66 (5.25-25.9)**	**7.70 (2.02-29.3)**	6.93 (0.93-51.9)	0.95 (0.12-7.31)	-	
Significance	***	*	p=0.16	p=0.54	-	-

*** p<0.001, * p<0.05 Significant association between EGM frequency & harm domain incidence (negative binomial regression)
ne = not able to be estimated due to small numbers of harms

Figure 18 and Table 19 show incidence rates PPPY for sports betting frequency by four gambling harm domains, with Table 15 also presenting harm rate ratios (95% CI) from bivariate negative binomial regressions (but not for criminal harms due to small numbers). There association between harm domains and sports betting frequency follows a "U" shape, with higher incidence rates for gamblers not betting on sports, compared with less than monthly and monthly sports bettors, with the association

more pronounced and statistically significant for emotional/ psychological and financial harms. Emotional/psychological harms incidence rate for non-sports bettors was 12.3 PPPY, decreasing to 2.8 for less than monthly sports bettors, then increasing to 9.5 and 25 for monthly and weekly or more sports bettors. Financial harms incidence rate for non-sports bettors was 8.3 PPPY, decreasing to 3.9 and 3.3 for less than monthly and monthly sports bettors respectively, then increasing to 26 for weekly or more sports bettors. Incidence rates for relationship/family and work/study harms ranged between 0.1 and 2.6 PPPY, with this association non-significant.

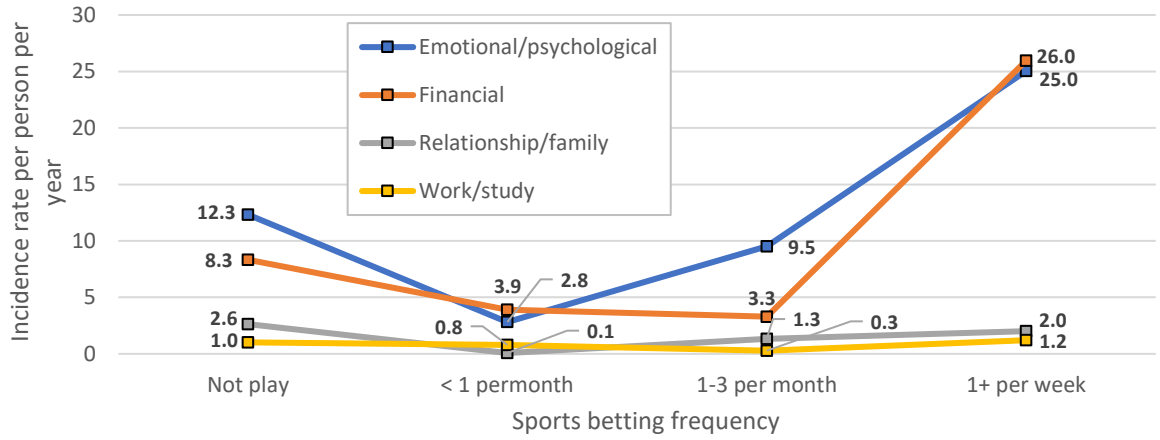

Figure 18: Sports betting frequency by harm domains incidence per person per year, 2018 at-risk gamblers

Table 19: Sports betting frequency by harm domains, incidence per person per year, harm rate ratios and population, 2018 at-risk gamblers

Sports betting	Emotional/ Psychological	Financial	Relationship/ family	Work/study	Criminal	Population N
	Domains: Incidence rate per person per year					
Not play	12.3	8.3	2.6	1.0	0.2	11,579
< 1 per month	2.8	3.9	0.1	0.8	0.0	8,449
1-3 per month	9.5	3.3	1.3	0.3	0.0	3,195
1+ per week	25.0	26.0	2.0	1.2	0.0	2,629
Total at-risk	**11.6**	**8.3**	**2.2**	**1.0**	**0.1**	**25,852**
	Domains: Harm Rate Ratios (95% CI)					
Not play	1.0	1.0	1.0	1.0	ne	-
< 1 per month	0.23 (0.10-0.52)	0.47 (0.20-1.12)	0.03 (0.00-0.20)	0.78 (0.15-4.02)	ne	-
1-3 per month	0.77 (0.37-1.60)	0.40 (0.11-1.39)	0.51 (0.06-4.07)	0.28 (0.03-2.53)	ne	-
1+ per week	2.03 (0.61-6.80)	**3.12 (1.13-8.61)**	0.76 (0.16-3.58)	1.19 (0.14-10.2)	ne	
Significance	**	**	**	p=0.69	-	-

*** p<0.001, * p<0.05 Significant association between sports betting frequency & harm domain incidence (negative binomial regression)
ne = not able to be estimated due to small numbers of harms

Figure 19 and Table 20 show incidence rates PPPY for racetrack betting frequency by four gambling harm domains, with Table 15 also presenting harm rate ratios (95% CI) from bivariate negative binomial regressions (but not for criminal harms due to small numbers). The association between harm domains incidence rates and racetrack betting frequency was inconsistent but was significant for emotional/psychological and financial harms. Emotional/psychological harms incidence rate PPPY was 10.2 for non-racetrack bettors, increasing to 14.7 for less than monthly racetrack bettors, then decreasing to 3.3 for monthly, before increasing again to 21.6 for weekly or more

racetrack bettors. Non-racetrack bettors had a financial harm incidence rate PPPY of 5.4, increasing to 8.2 for less than monthly racetrack bettors, 30.3 for monthly, the decreasing to 19.1 for weekly racetrack bettors. Relationship/family harms incidence rate PPPY was 1.3 for non-racetrack bettors, increasing to 2.2 for less than monthly racetrack bettors, increasing again to 14.1 for monthly, then decreasing to 1.5 for weekly racetrack bettors. Work/study harms incidence rate PPPY ranged between 0 and 2.2 with no discernible pattern.

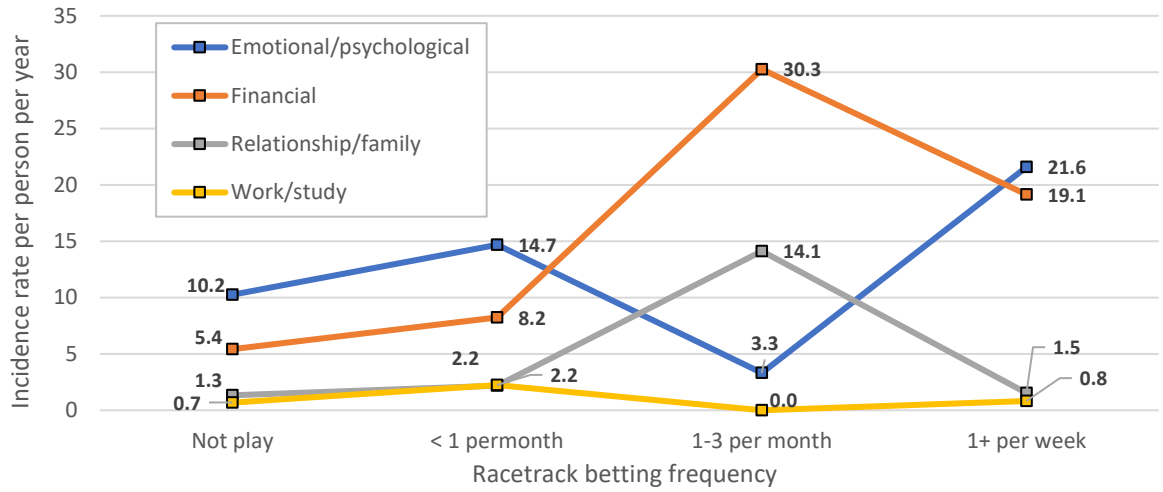

Figure 19: Racetrack betting frequency by harm domains incidence per person per year, 2018 at-risk gamblers

Table 20: Racetrack betting frequency by harm domains, incidence per person per year, harm rate ratios and population, 2018 at-risk gamblers

Racetrack betting	Emotional/ Psychological	Financial	Relationship/ family	Work/study	Criminal	Population N
	Domains: Incidence rate per person per year					
Not play	10.2	5.4	1.3	0.7	0.1	17,693
< 1 per month	14.7	8.2	2.2	2.2	0.0	4,764
1-3 per month	3.3	30.3	14.1	0.0	2.0	1,385
1+ per week	21.6	19.1	1.5	0.8	0.0	2,010
Total at-risk	**11.6**	**8.3**	**2.2**	**1.0**	**0.1**	25,852
	Domains: Harm Rate Ratios (95% CI)					
Not play	1.0	1.0	1.0	ne	ne	-
< 1 per month	1.43 (0.53-3.84)	1.52 (0.64-3.61)	1.64 (0.47-5.73)	ne	ne	-
1-3 per month	0.32 (0.15-0.70)	**5.58 (1.01-30.7)**	**10.6 (1.36-82.6)**	ne	ne	-
1+ per week	2.11 (0.76-5.87)	**3.53 (1.40-8.92)**	1.16 (0.30-4.47)	ne	ne	
Significance	***	*	p=0.15	-	-	-

*** p<0.001, * p<0.05 Significant association between racetrack betting frequency & harm domain incidence (negative binomial regression)
ne = not able to be estimated due to small sample and missing data for reference categories

3.2 Analyses of harm from someone else's gambling

The analyses contained in this section will focus on harms from someone else's gambling, followed by a final results section which brings the harms from own gambling and harms form someone else's gambling together to gain a picture of the full extent of gambling-related harms in the population.

3.2.1 Harm from someone else's gambling by survey

Figure 19 shows the percentage of the NT adult population negatively affected by someone else's gambling, while Table 20 shows population counts. There was a significant decline from 13% to 8.1% in the percentage of the population reporting that they had been negatively affected by someone else's gambling.

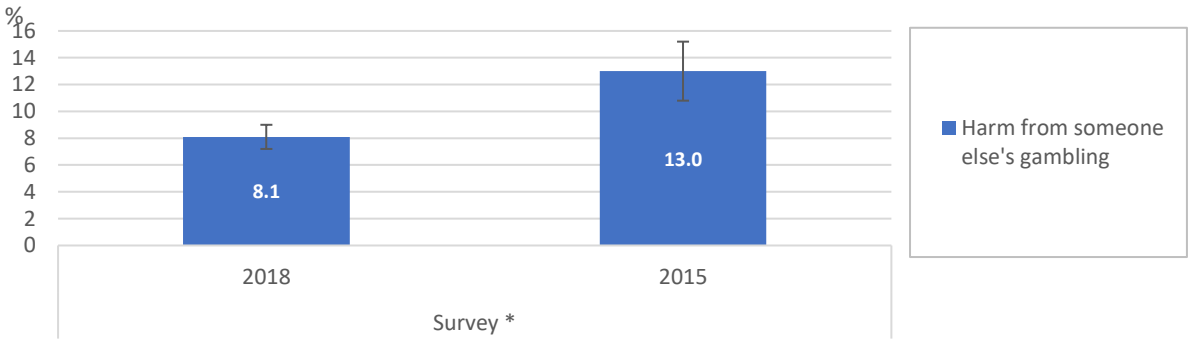

Figure 20: Harm from someone else's gambling by survey, 2015 & 2018 adult population

* p<0.05 Significant difference between surveys

There was a reduction of 8,500 adults who indicated that they had been harmed from someone else's gambling, while there was an increase in the adult population of 3,300.

Table 21: Harm from someone else's gambling by survey, 2015 and 2018 adult population

	2018 N	2015 N	Difference N
None	165,647	153,832	11,815
Harm from someone else's gambling	14,521	23,034	-8,513
Total	180,168	176,866	3,302

3.2.2 Number of harms from someone else's gambling

Figure 21 and Table 22 show percentage and adult population counts of number of harms from someone else's gambling by survey. There was a slightly higher percentage of adults reporting being affected by three or more harms in 2018, compared with 2015, and a lower percentage reporting one or two.

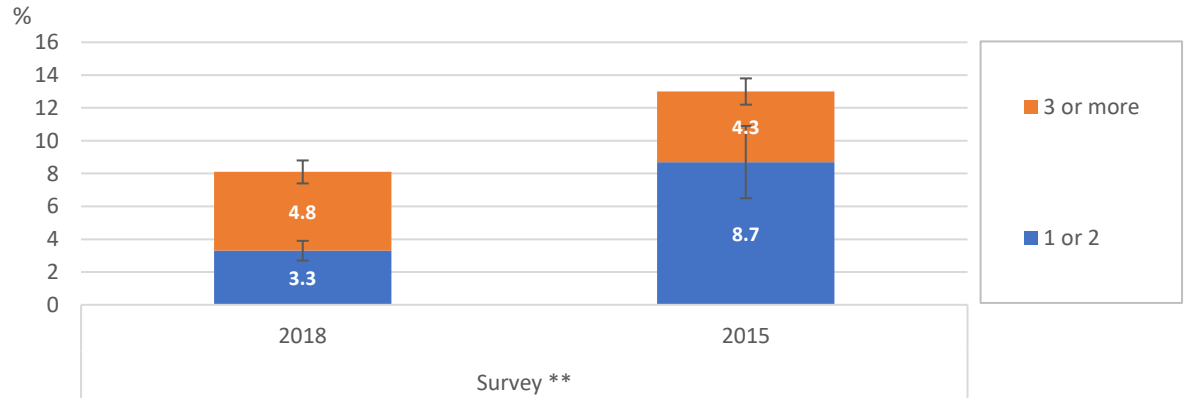

Figure 21: Number of harms from someone else's gambling by survey, 2015 & 2018 adult population

* p<0.05: Significant difference between surveys

Table 22: Number of harms from someone else's gambling by survey, 2015 and 2018 adult population

Harm from someone else's gambling	2018 N	2015 N	Difference N
None	165,647	153,832	11,815
One or two	5,914	15,401	-9,487
Three or more	8,608	7,633	975
Total	**180,168**	**176,866**	**3,302**

3.2.3 Harm from someone else's gambling by problem gambling risk

Figures 22 and 23 show the association between problem gambling risk and being harmed form someone else's gambling for 2018 and 2015. There was a highly significant association between problem gambling risk and harm form someone else's gambling in 2018, but no significant association in 2015. In 2018, gamblers with high (18.2%), moderate (26.5%) and low (14.9%) risk of problem gambling were more likely to be harmed, compared with no risk (7.3%) and non-gamblers (4.6%). A very similar trend to 2018 in harm from someone else's gambling by problem gambling risk was present in 2015, albeit at slightly higher levels of harm, and it is likely that this association did not reach statistical significance due to the smaller sample size of the 2015 survey.

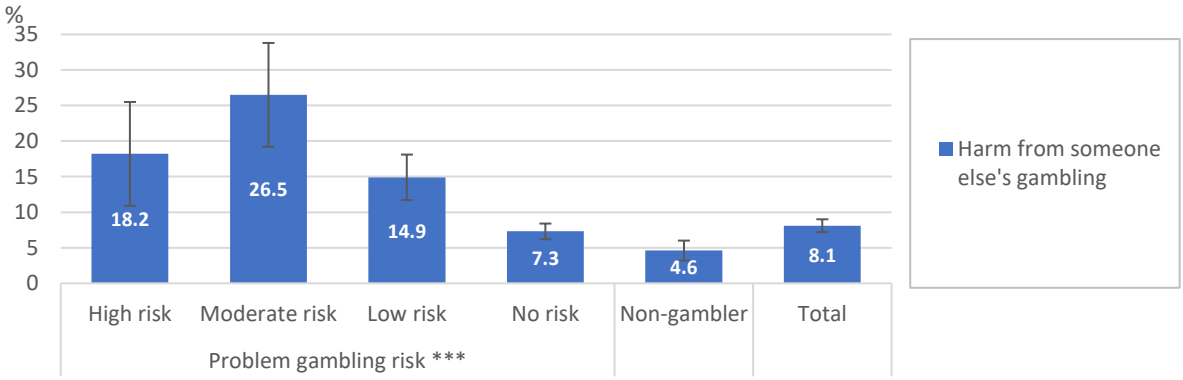

Figure 22: Harm from someone else's gambling by problem gambling risk, 2018 adult population

*** p<0.001: Significant association between problem gambling risk and harm from someone else's gambling

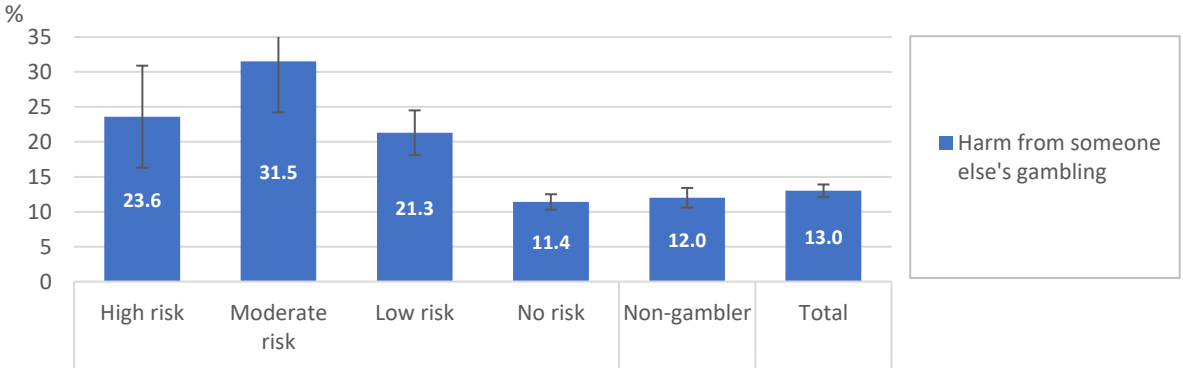

Figure 23: Harm from someone else's gambling by problem gambling risk, 2015 adult population

3.2.4 Types and frequency of harms from someone else's gambling

Figure 24 shows the change in reporting of types of harms between 2015 and 2018, for those harms that were comparable. Note, that only annual prevalence was collected in 2015, so frequency of harms was not able to be compared between the two surveys. In addition to experiencing at least one harm declining significantly from 2015 to 2018, there was also a significant decline for relationship problems with family or friends (7.7% to 3.9%) and raided savings (5.7% to 2%). The relationship problems harm was collected separately for family and friends in 2015, which may have led to the higher prevalence in 2015, compared with 2018.

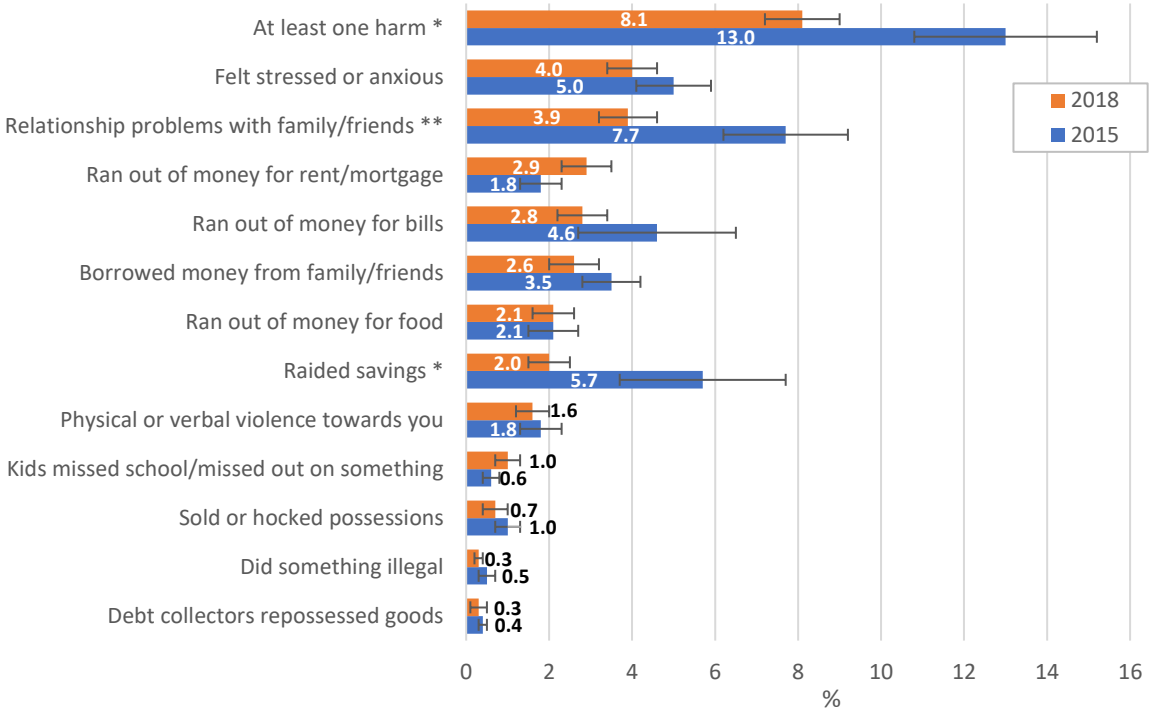

Figure 24: Types of harms from someone else's gambling by survey, 2015 and 2018 adult population

** p<0.01, * p<0.05: Significant difference between 2015 and 2018

Figure 25 shows frequency of occurrence for harms from someone else's gambling for the NT adult population, while Table 22 presents population counts by frequency of occurrence. The two most endorsed harms form someone else's gambling were in the emotional/psychological and relationships/family domains. The most commonly occurring harm because of someone else's gambling was felt stressed or anxious, with 1.3% (or 2,340) of NT adults experiencing this weekly, 2.3% (or 4,155) of adults monthly, and 0.4% (752) of adults less than monthly, or 4% (or 7,250) of adults at least once per year. Relationship problems with family or friends were the next most endorsed, with 1.1%, 2.3% and 0.4% experiencing this harm weekly, monthly, and less than monthly respectively. This was followed by three more harms relating to financial problems, and included running out of money for rent/mortgage (1,310 weekly and 5,300 at least once per year), running out of money for bills (2,800 monthly and 5,050 at least once per year), and borrowing money from family or friends (2,360 monthly and 4,700 at least once per year). Criminal, work/study-related harms and more serious financial harms such as debt collectors repossessing goods, though over 500 adults were still affected by these harms.

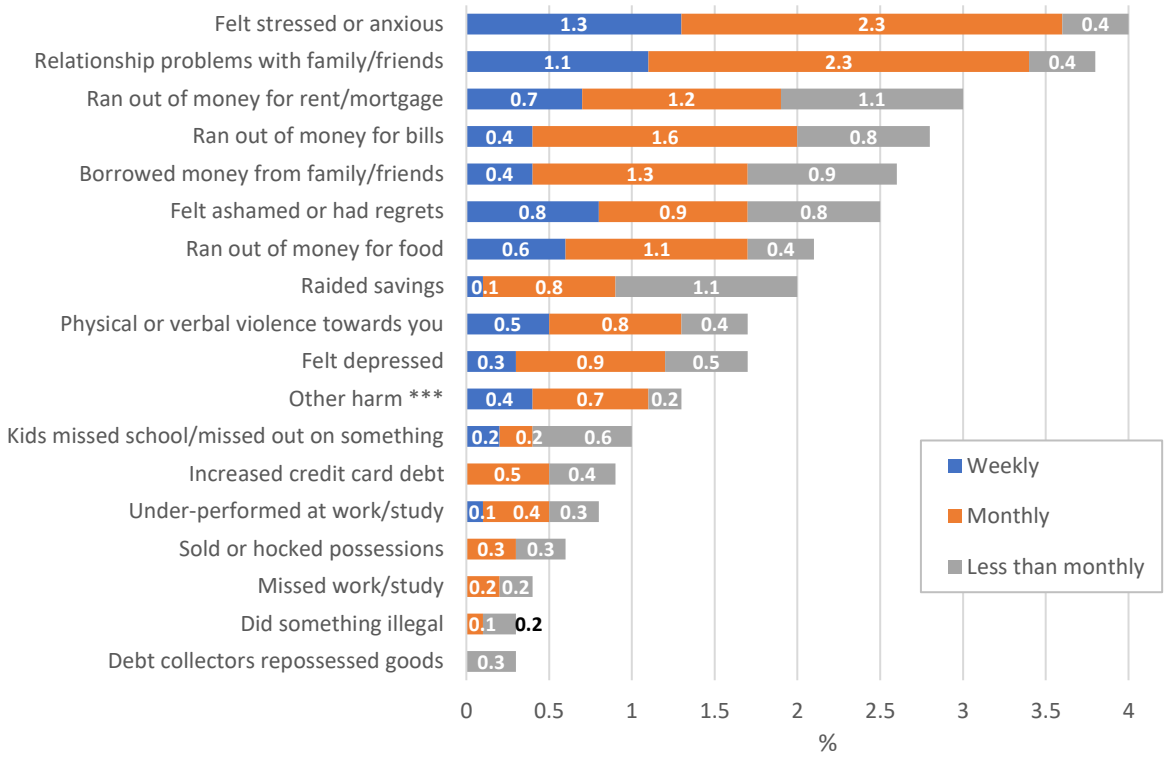

Figure 25: Frequency of types of harms from someone else's gambling, 2018 adult population

Table 23: Frequency of types of harms from someone else's gambling, 2018 adult population

Types of harms	Weekly N	Monthly N	< Monthly N	Total N
At least one harm	-	-	-	*14,521*
Felt stressed or anxious	2,344	4,155	752	7,251
Relationship problems with family/friends	2,044	4,214	758	7,016
Ran out of money for rent/mortgage	1,310	2,088	1,938	5,336
Ran out of money for bills	705	2,839	1,513	5,057
Borrowed money from family/friends	693	2,366	1,635	4,694
Felt ashamed or had regrets	1,433	1,642	1,481	4,556
Ran out of money for food	1,119	1,945	737	3,801
Raided savings	209	1,424	2,021	3,654
Felt depressed	552	1,712	990	3,254
Physical or verbal violence towards you	840	1,407	707	2,954
Other harm	653	1,317	299	2,269
Kids missed school/missed out on something	397	440	1,059	1,896
Increased credit card debt	0	826	713	1,539
Under-performed at work/study	100	733	525	1,358
Sold or hocked possessions	0	567	630	1,197
Missed work/study	0	447	340	787
Debt collectors repossessed goods	0	0	506	506
Did something illegal	0	169	336	505

3.2.6 Exploratory factor analysis of harms from someone else's gambling

Table 24 presents the results from the rotated exploratory factor analysis of harms from someone else's gambling. Two of the items from the work/study domain (lost

job/kicked out of study and missed work/study) were merged due to low prevalence. Compared with the factor analysis of own gambling harms incidence, there is more double loadings across factors indicating that harms in different domains have multiple correlations with items in other domains. The five-factor solution explained over 70% of the variance in the individual harms. Factor 1 consists of items with a loading of 0.4 or more from domains of emotional/psychological (2), relationship/family (2) and work/study (1), while felt depressed from emotional/psychological had a loading of 0.31 on this factor. Harms with a loading of greater than 0.4 on Factor 2 included three from financial harms and missing work/study or losing job/kicked out of study. Under-performing in work/study, which loaded on Factor 1 with 0.54, also loaded on Factor 2 with 0.30, while running out of money for mortgage or rent also had a loading of 0.33 on Factor 2. Factor 3 captures harms from criminal (1), emotional/psychological (1), as well as lower loading of between 0.3 and 0.4 for children missing school or out on something, feeling stressed or anxious and feeling ashamed or having regrets. Factor 4 included four financial harms with loadings greater than 0.4, and another financial harm between 0.3 and 0.4. Lastly, Factor 5 included two harms with loadings greater than 0.4, increased credit card debt (financial) and children missing out on something or school, as well as a financial harm loading between 0.3 and 0.4.

Table 24: Exploratory factor analysis of harms from someone else's gambling, 2018 adult population

Type of harm (domain)	Factor1	Factor2	Factor3	Factor4	Factor5	Prevalence % (SE)
Felt ashamed or had regrets (EP)	**0.90**	-0.03	**0.32**	0.04	0.03	2.5 (0.5)
Relationship problems family/friends (RF)	**0.88**	0.17	0.30	0.08	0.05	3.9 (0.7)
Felt stressed or anxious (EP)	**0.82**	0.27	**0.32**	0.10	0.00	4.0 (0.6)
Physical or verbal violence towards you (RF)	**0.75**	-0.14	-0.21	0.12	0.15	1.6 (0.4)
Under-performed at work/study (WS)	**0.54**	**0.30**	-0.17	-0.21	-0.11	0.7 (0.2)
Borrowed money from family/friends (F)	0.08	**0.86**	0.00	0.14	0.02	2.6 (0.6)
Ran out of money for food (F)	0.08	**0.71**	-0.07	**0.36**	0.25	2.1 (0.5)
Missed/lost job/kicked out work/study (WS)	0.20	**0.68**	**0.42**	-0.18	-0.01	0.4 (0.2)
Ran out of money for bills (F)	0.10	**0.52**	0.08	**0.54**	**0.34**	2.8 (0.6)
Did something illegal (C)	0.26	0.02	**0.90**	0.02	0.05	0.3 (0.1)
Felt depressed (EP)	**0.31**	0.07	**0.83**	0.17	0.07	1.8 (0.4)
Sold or hocked possessions (F)	0.09	0.03	-0.01	**0.77**	-0.09	0.7 (0.3)
Ran out of money for rent/mortgage (F)	0.15	**0.33**	0.23	**0.69**	0.15	2.9 (0.6)
Raided savings (F)	0.08	0.03	0.28	**0.50**	-0.01	2.0 (0.5)
Increased credit card debt (F)	0.04	0.03	-0.07	0.07	**0.83**	0.9 (0.4)
Kids missed school/ out on something (RF)	0.10	0.20	**0.32**	-0.01	**0.72**	1.0 (0.3)
Eigen value	3.39	2.33	2.29	1.89	1.46	-
Cumulative variance explained	21.2%	35.8%	50.1%	61.9%	71.0%	-

Notes: Loadings in **black bold font** greater than 0.40, and **red bold font** between 0.30 and 0.40
EP = emotional/psychological; RF = relationships/family; F = financial; WS = work/study; C = criminal

Table 25 presents results from the exploratory factor analysis of harm domains. A single factor explaining 55% of the variation in the five domains was extracted, indicating that the five domains are capturing a single construct of gambling harm from someone else's gambling. Emotional/psychological and relationship/family domains had the highest loadings, both above 0.9, followed by criminal (0.72), work/study (0.54) and financial (0.50).

Table 25: Exploratory factor analysis of harm domains from someone else's gambling, 2018 adult population

Variable	Factor1	Prevalence % (SE)
Emotional/psychological	**0.93**	4.6 (0.7)
Relationship/family	**0.91**	4.0 (0.7)
Criminal	**0.72**	0.3 (0.1)
Work/study	**0.54**	0.9 (0.3)
Financial	**0.50**	5.1 (0.8)
Eigen value	2.75	-
Variance explained	55%	-

3.2.7 Incidence of harms from someone else's gambling by domain

Figure 26 shows the distribution of incidence of harms form someone else's gambling by domain, while Table 26 includes incidence rate per person per year (PPPY). The distribution of incidence of harms across domains differs to that observed for own gambling harm domains (see Figure 10 and Table 14). Financial harms had the highest incidence, making up 35% of all harms from someone else's gambling, followed by emotional/psychological (33%), relationship/family (28%), work/study (4%) and criminal 0.6%.

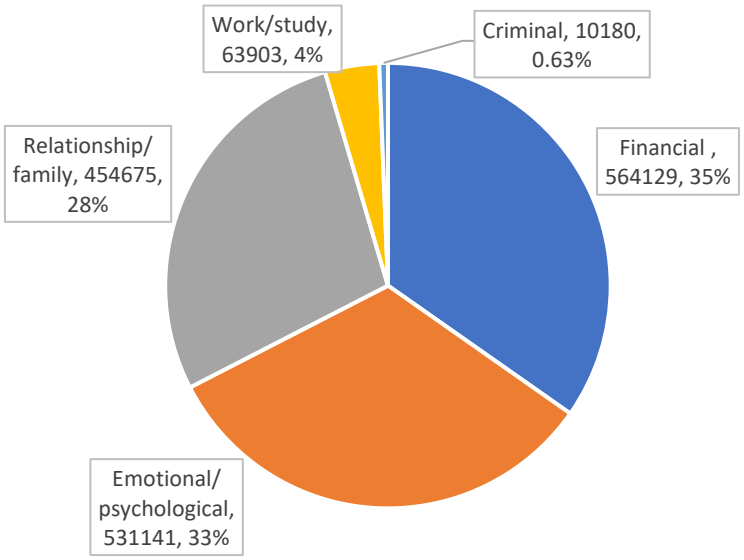

Figure 26: Distribution of incidence of harms from someone else's gambling by domain, 2018 adult population

Table 26 shows the incidence rate PPPY for the total adult NT population, and in the population harmed by someone else's gambling. The incidence rates in the adult population are relatively small, with the highest incidence rate for financial harms (3.1), followed by emotional/ psychological (2.9), relationship/family (2.5), work/study (0.4) and criminal (0.06). However, when constraining incidence rates to the harmed population for the specific domain, the rate increases dramatically as shown in Figure 27 and the last column of Table 26.

Table 26: Incidence, percentage, adult population, incidence rate per person per year, harmed population, and incidence rate per harmed person per year by own gambling harm domain, 2018 adult population

Harm domain	Incidence	Percentage %	Total Population N	Total: Incidence rate PPPY	Harmed Population£ N	Harmed: Incidence rate PPPY
Financial	564,129	34.7	180,956	3.1	9,275	60.8
Emotional/psychological	531,141	32.7	180,956	2.9	8,342	63.7
Relationship/family	454,675	28.0	180,956	2.5	7,166	63.4
Work/study	63,903	3.9	180,956	0.4	1,634	39.1
Criminal	10,180	0.6	180,956	0.06	504	20.2
Total	**1,624,028**	**100.0**	**180,956**	**8.97**	**14,521**	**111.8**

£ Total are those endorsing at least one gambling harm, while domain populations are those endorsing at least one harm from the domain

The highest incidence rate PPPY is now for emotional/psychological harms (63.7), followed by relationship/family (63.4), financial (60.8), work/study (39.1) and criminal (20.2). Changing the population denominator so as to only include gamblers endorsing at least one harm from the domain for which the incidence rate is calculated changes the distribution, with financial (26%) and relationship/family (26%) domains now making up the largest proportion, while also increasing the criminal domains from less than 1% of the incidence of criminal harms to making up 8% of the total incidence rate, and also increasing the work/study domain from 4$ to 16%, and decreasing the financial domain's chare from 35% to 24%.

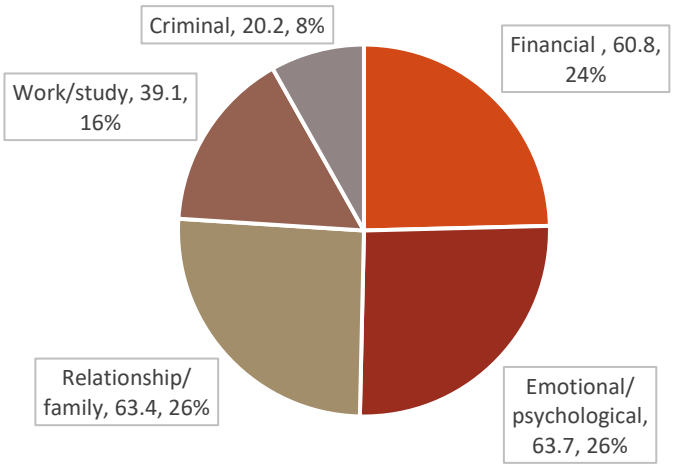

Figure 27: Distribution of incidence rate of harms from someone else's gambling by domain for those endorsing at least one harm in the domain, 2018 adult population

3.2.8 Incidence of harms from someone else's gambling by problem gambling risk

Figure 28 presents incidence rates per person per year by problem gambling risk for the five domains of harm, while Table 27 presents incidence, population and incidence rates, and Figure 29 shows the distribution of incidence rate of harm domains across problem gambling risk categories. The relationship between domains of harm and problem gambling risk is generally non-linear, except for financial harms, with low risk gamblers having the highest incidence rate for emotional/psychological (12.7) and relationship/family (9.8) harm domains.

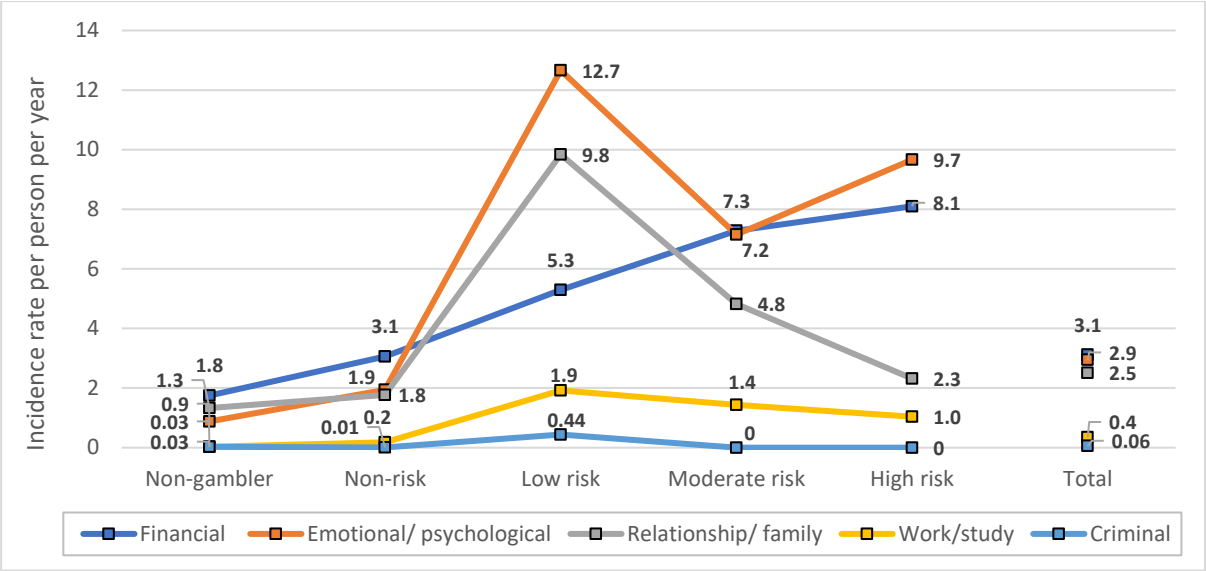

Figure 28: Problem gambling risk by harm domain from someone else's gambling: incidence rate per person per year, 2018 adult population

Table 27: Problem gambling risk by harm domain from someone else's gambling: Incidence and incidence per person per year, 2018 adult population

PG Risk	Financial	Emotional/ psychological	Relationship/ family	Work/study	Criminal	Population
			Incidence of harms			
Non-gambler	89,972	68,263	45,116	1,403	1,518	51,423
Non-risk	317,595	183,030	201,599	18,148	1,183	103,681
Low risk	89,599	166,660	214,390	32,490	7,479	16,938
Moderate risk	46,810	30,953	45,975	9,268	0	6,426
High risk	20,153	5,769	24,062	2,594	0	2,487
Total	**564,129**	**454,675**	**531,141**	**63,903**	**10,180**	**180,956**
			Incidence per person per year			
Non-gambler	1.7	1.3	0.9	0.03	0.03	-
Non-risk	3.1	1.8	1.9	0.2	0.01	-
Low risk	5.3	9.8	12.7	1.9	0.4	-
Moderate risk	7.3	4.8	7.2	1.4	0	-
High risk	8.1	2.3	9.7	1.0	0	-
Total	**3.1**	**2.5**	**2.9**	**0.4**	**0.06**	**-**

Figure 29 shows that relationship/family harms made up the greatest proportion for low, moderate, and high-risk gamblers, while financial harms made up the greatest proportion for non-risk gamblers and noon-gamblers. The work/study harm domain incidence rate proportion was greater among the at-risk gamblers, compared with no risk and non-gamblers.

The incidence rates presented in the last few tables and figures apply to the whole population, yet only 8.1% were harmed by someone else's gambling, so the incidence rates are quite low. It is also useful to examine incidence rates for those endorsing at least one harm for the domain and calculating the "true" incidence rate just among those negative affected by someone else's gambling.

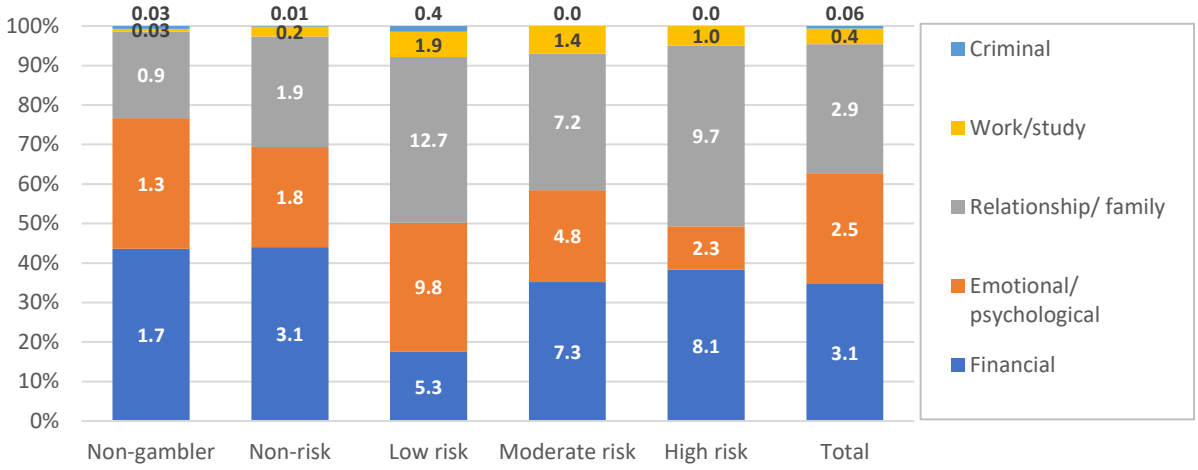

Figure 29: Distribution of incidence rate per person per year by problem gambling risk, 2018 adult population

Figure 30 shows the incidence rates for each domain for those people endorsing at least one harm for that domain. As would be expected incidence rates are significantly higher than when calculated for the total adult population. The relationship between domains of harm and problem gambling risk is again non-linear with low risk gamblers experiencing the highest incidence rates for emotional/psychological (122.3), relationship/family (95.1), work/study (18.5) and criminal (4.3) harm domains. Non-gamblers and moderate risk gamblers tended to have the lowest incidence rates across problem gambling risk groups.

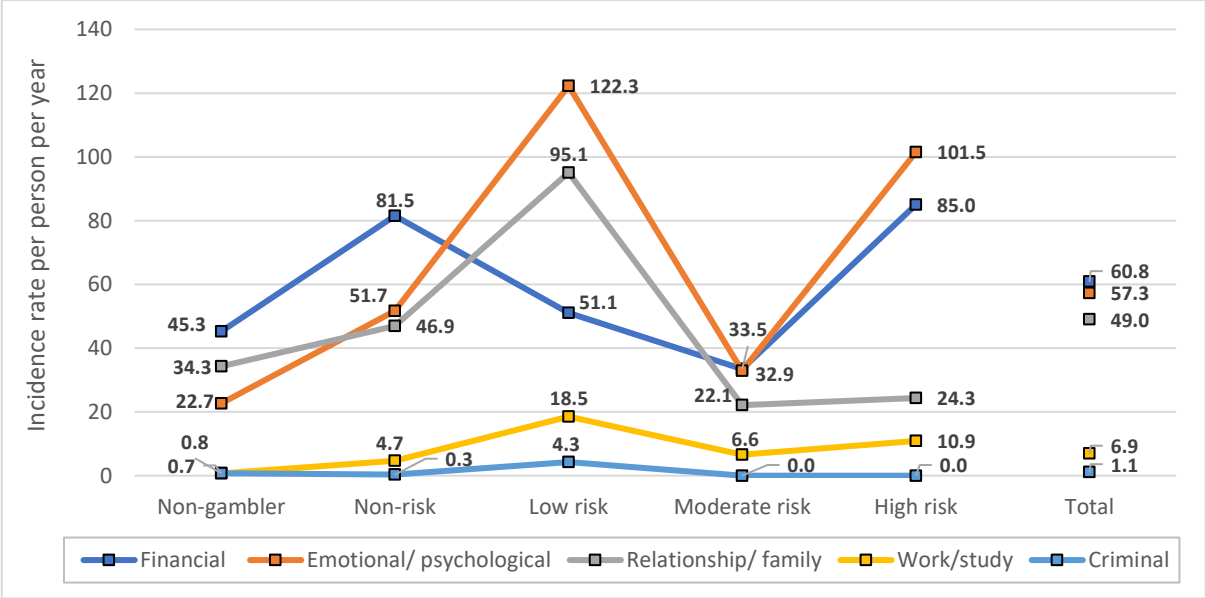

Figure 30: Problem gambling risk by harm domain from someone else's gambling: incidence per person per year for population endorsing at least one harm in the domain, 2018 adult population harmed by someone else's gambling

3.2.9 Multivariable models: Factors associated with harm from someone else's gambling

Harm domains association with socio-demographic and socioeconomic factors was first examined, but there was little variation in predictors of incidence of domain harms, so all harm domains were added to gain an overall incidence of gambling harm from someone else's gambling. Initial modelling revealed that Indigenous status interacted with a range of variables, so a stratified analysis was then investigated. However, due to the small sample size of the Indigenous sample, multivariable modelling was not able to be done. Therefore, only significant bivariate associations for the Indigenous sample are presented. Three models identifying predictors of harm were developed to determine differences in predictors, depending on the way in which gambling harms from someone else's gambling were measured. The models and outcome variables used were: (i) modelling incidents of gambling harm using the negative binomial model, (ii) modelling number of different harms using the negative binomial model, and (iii) modelling at least one gambling harm using the logistic regression model.

3.2.9.1 Multivariable models for the NT Aboriginal and Torres Strait Islander population

Table 28 reports results from the negative binomial multivariable model and shows incidence rate ratios (IRRs), incidence rate, prevalence of at least one harm from someone else's gambling and the population for the Aboriginal and Torres Strait Islander sample. Age, household type, student status, smoking status and attitudes to gambling remained significant in the model after backward selection of variables. Note that most estimates in this model have high standard errors due to the relatively small sample size captured for the Aboriginal and Torres Strait Islander population. Those aged between 30 and 65 years had significantly higher incidence rates, compared with those under 30 years and those older than 65 years. Incidence rate of gambling harms were significantly higher for people living alone, as were current daily smokers and ex-smokers and people who were perceived gambling negatively.

Table 28: Negative binomial regression model for incidence of harms from someone else's gambling in last year, 2018 adult Aboriginal and Torres Strait Islander population

	IRR (95% CI)	Incidence rate PPPY	Harmed % (SE)	Indigenous Population (N)
NT Indigenous adults	-	*21.8*	*16.5 (2.7)*	*44,410*
Age (years)*				
18-29	1.0	3.3	13.7 (6.1)	12,933
30-39	**6.07 (1.21-30.52)**	19.8	21.2 (6.6)	11,675
40-49	**10.74 (1.57-73.55)**	34.9	16.2 (4.8)	9,347
50-64	**12.54 (2.30-68.49)**	40.8	17.2 (4.6)	7,839
65 or more	5.86 (0.62-54.97)	19.1	9 (5.4)	2,617
Household type***				
Couple with children	1.0	9.1	15.6 (5.0)	15,220
Couple with no children	2.21 (0.69-7.07)	20.1	21.9 (8.4)	7886
Single person with children	0.29 (0.08-1.10)	2.7	17.7 (8.9)	5026
Single person	**7.97 (2.14-29.6)**	72.5	13.9 (4.8)	7295
Group/Other	1.60 (0.45-5.69)	14.6	14.6 (4.8)	8984
Smoking status				
Never smoker	1.0	10.0	11.7 (3.7)	19,456
Ex-smoker	**13.18 (3.36-51.79)**	52.4	21.5 (6.3)	11,219
Daily Smoker	**17.64 (4.22-73.67)**	13.6	19.3 (5.7)	13,711

	IRR (95% CI)	Incidence rate PPPY	Harmed % (SE)	Indigenous Population (N)
NT Indigenous adults	-	*21.8*	*16.5 (2.7)*	*44,410*
Attitudes to gambling scale				
Most positive	1.0	1.7	14.1 (7.6)	5,916
3rd quartile	**57.5 (7.32-450.)**	4.4	11.1 (4.7)	12,559
2nd quartile	**414.9 (73.1-2356)**	16.9	16.1 (5.5)	12,782
Most negative	**4907 (609-39511)**	53.9	24.0 (5.4)	12,755

Notes: **Bold font** indicates category of variable significant at p<0.05; *, **, *** = p<0.05, 0.01, 0.001

Table 29 shows the results of the negative binomial model modelling the number of different types of harms experienced because of someone else's gambling (not the incidence/frequency of occurrence of the harms). Number of harm rate ratios, incidence rate, prevalence of the harm and the population are presented. No socio-demographic or socioeconomic variables remained significant in the model. Cannabis and cocaine use in the last year, along with having a negative perception of gambling were significantly associated with experiencing a greater number of individual harms.

Table 29: Negative binomial regression model for number of harms from someone else's gambling in last year, 2018 adult Aboriginal and Torres Strait Islander population

	Harm RR (95% CI)	Incidence rate PPPY	Harmed % (SE)	Indigenous Population (N)
NT Indigenous adults	-	*21.8*	*16.5 (2.7)*	*44,410*
Cannabis use				
Does not use	1.0	20.9	15 (3.0)	37,953
Used in last year	**2.76 (1.13-6.75)**	27.2	25.2 (8.2)	6,457
Cocaine use				
Does not use	1.0	21.7	15.5 (2.7)	43,430
Used in last year	**6.05 (1.56-23.5)**	28.8	60.9 (21.)	980
Attitudes to gambling scale				
Most positive	1.0	1.7	14.1 (7.6)	5,916
3rd quartile	0.71 (0.15-3.45)	4.4	11.1 (4.7)	12,559
2nd quartile	1.98 (0.38-10.4)	16.9	16.1 (5.5)	12,782
Most negative	**5.48 (1.31-22.8)**	53.9	24.0 (5.4)	12,755

Notes: **Bold font** indicates category of variable significant at p<0.05

The last multivariable regression model for the Aboriginal and Torres Strait Islander population was a logistic regression model modelling experience of at least one harm. Compared with the rest of NT, people living in Alice Springs or regional towns were significantly more likely to experience at least one harm from someone else's gambling, as were those who had used cocaine use in the last year compared with no use.

Table 30: Logistic regression model for at least one harm from someone else's gambling in last year, 2018 adult Aboriginal and Torres Strait Islander population

	OR (95% CI)	Incidence rate PPPY	Harm % (SE)	Indigenous Population (N)
NT Indigenous adults	-	*21.8*	*16.5 (2.7)*	*44,410*
Region				
Rest of NT	1.0	10.9	5.0 (2.4)	12,016
Alice Springs	**5.04 (1.38-18.4)**	41.9	21.0 (6.7)	12,345
Regional towns	**5.93 (1.65-21.3)**	16.3	25.7 (7.3)	11,146

	OR (95% CI)	Incidence rate PPPY	Harm % (SE)	Indigenous Population (N)
NT Indigenous adults	-	*21.8*	*16.5 (2.7)*	*44,410*
Darwin/Palmerston	2.62 (0.84-8.20)	15.8	14.4 (2.8)	8,903
Cocaine use				
Does not use	1.0	21.7	15.5 (2.7)	43,430
Used in last year	**7.81 (1.53-40.0)**	28.8	60.9 (22.)	980

Notes: **Bold font** indicates category of variable significant at p<0.05

3.2.9.2 Multivariable models for the non-Indigenous population

Tables 31 to 33 show multivariable regression models for incidence of gambling harms, number of gambling harms and experience of at least one gambling harm from someone else's gambling respectively for the non-Indigenous population. Labour force status, personal income, psychological distress, experience of domestic/family violence in the last year and perceptions of gambling were all multivariable significantly associated with incidence if gambling harm. Those not in the work force or working as a FIFO/DIDO worker had a significantly higher incidence pf gambling related harms, compared with other employed people. Those on incomes above $100,000 per annum had the lowest incidence of gambling harms, with those earning between $50,000 and $99,999 having significantly higher incidence. People experiencing moderate or high levels of psychological distress were had significantly higher incidence than those with no/low distress. People experiencing domestic/family violence had significantly higher incidence of gambling harm, while all those who perceived gambling negatively had a significantly higher incidence of gambling harms than people who had a positive perception of gambling.

Table 31: Negative binomial regression model for incidence of harms from someone else's gambling in last year, 2018 adult non-Indigenous population

	IRR (95% CI)	Incidence rate PPPY	Harm % (SE)	Non-Indigenous Population (N)
NT Non-Indigenous adults	-	*4.8*	*5.3 (0.7)*	*136,546*
Labour force status				
Employed	1.0	3.4	5 (0.8)	97,106
Unemployed	0.27 (0.04-1.92)	0.6	2.1 (1.5)	5,398
FIFO/DIDO[£]	**7.16 (2.10-24.4)**	17.1	11.4 (4.2)	11,106
Not in the labour force	**3.23 (1.02-10.3)**	6.0	4.5 (1.3)	22,737
Personal income				
$100K or more	1.0	0.9	3.2 (0.8)	40,687
$70-$99K	**4.10 (1.52-11.1)**	9.9	6.6 (1.7)	32,219
$50-$69K	**5.88 (1.70-20.3)**	5.4	9.4 (2.8)	23,823
$30-$49K	0.99 (0.29-3.34)	1.8	4.2 (1.3)	18,891
$20-$29K	4.25 (0.96-18.9)	8.0	4.9 (1.6)	11,064
Less than $20K	0.98 (0.16-6.18)	4.9	2.9 (1.6)	9,862
Kessler-5 psychological distress				
Low/no distress	1.0	2.4	4.3 (0.9)	77,371
Moderate distress	**1.27 (0.55-2.94)**	9.2	6.1 (1.6)	34,366
High distress	**4.43 (1.49-13.2)**	4.1	4 (1.2)	16,865
Very high distress	1.97 (0.63-6.21)	11.2	14.6 (5.8)	7,944
Domestic or family violence				
Did not experience	1.0	3.0	4.1 (0.6)	119,119
Experienced in last year	**7.06 (2.88-17.3)**	17.6	14.3 (4)	17,142

	IRR (95% CI)	Incidence rate PPPY	Harm % (SE)	Non-Indigenous Population (N)
NT Non-Indigenous adults	-	*4.8*	*5.3 (0.7)*	*136,546*
Attitudes to gambling scale				
Positive	1.0	0.2	1.4 (0.5)	32,103
A bit negative	**49.45 (14.0-174.)**	1.9	4.9 (1.4)	36,981
Somewhat negative	**43.21 (15.6-120.)**	5.1	6.4 (1.5)	28,932
Most negative	**74.14 (26.8-205.)**	11.4	8.2 (1.8)	37,939

Notes: **Bold font** indicates category of variable significant at p<0.05; £ FIFO/DIDO = Employed as a fly-in fly-out/drive-in drive-out worker

Tale 32 shows the results from modelling number of harms experienced because of someone else's gambling. Age, household type, personal income, self-assessed health, smoking status, experience of domestic/family violence and pe4rception of gambling were all showed a significant multivariable association with number of harms. Those ages 40-49 years and 65 years or more experienced significantly more harms than those less than 30 years, while single parents with children and those living in group/share households experienced more harms, compared with couple living with children households. Significantly higher number of harms were observed for those aged 40-49 years and 65 years or more, living in single parent and group/share households, earning $70,000 to $99,999 per annum, with very good or poor self-assessed health, daily smokers, experienced domestic /family violence and with a negative attitude towards gambling.

Table 32: Negative binomial regression model for <u>number of harms</u> from someone else's gambling in last year, 2018 adult non-Indigenous population

	Harm RR (95% CI)	Incidence rate PPPY	Harm % (SE)	Non-Indigenous Population (N)
NT Non-Indigenous adults	-	*4.8*	*5.3 (0.7)*	*136,546*
Age group (years)				
Less than 30	1.0	8.1	8.1 (2.7)	26,560
30-39	1.28 (0.53-3.07)	4.8	3.2 (1.1)	34,340
40-49	**2.69 (1.08-6.72)**	4.3	5.7 (1.3)	28,761
50-64	1.28 (0.55-2.99)	1.9	4.4 (0.9)	32,248
65 or more	**3.74 (1.40-10.0)**	6.1	6.7 (1.9)	14,636
Household type				
Couple living with children	1.0	3.9	4.0 (1.1)	47,888
Couple living with no children	1.37 (0.64-2.91)	2.4	3.0 (0.8)	37,197
Single parent with children	**3.03 (1.25-7.34)**	11	7.3 (2.6)	8,371
Single person	1.62 (0.81-3.24)	5.5	7.5 (2.2)	21,643
Group/Other	**5.86 (2.70-12.7)**	7.8	9.5 (2.7)	21,446
Personal income				
$100K or more	1.0	0.9	3.2 (0.8)	40,687
$70-$99K	**3.29 (1.58-6.86)**	9.9	6.6 (1.7)	32,219
$50-$69K	1.62 (0.74-3.52)	5.4	9.4 (2.8)	23,823
$30-$49K	0.58 (0.23-1.41)	1.8	4.2 (1.3)	18,891
$20-$29K	0.63 (0.26-1.55)	8.0	4.9 (1.6)	11,064
Less than $20K	0.83 (0.26-2.62)	4.9	2.9 (1.6)	9,862
Self-assessed health				
Excellent	1.0	2.3	3.2 (1.2)	21,706
Very good	**2.44 (1.16-5.12)**	7.8	5.1 (1.3)	43,526
Good	1.21 (0.56-2.59)	1.6	3.9 (0.8)	50,089

	Harm RR (95% CI)	Incidence rate PPPY	Harm % (SE)	Non-Indigenous Population (N)
NT Non-Indigenous adults	-	*4.8*	*5.3 (0.7)*	*136,546*
Fair	1.84 (0.71-4.76)	4.3	7.2 (2.0)	16,700
Poor	**8.80 (3.32-23.3)**	26.5	27.9 (11.)	4,291
Smoking status				
Never smoker	1.0	4.6	4.3 (1.1)	68,848
Ex-smoker	1.71 (0.95-3.09)	3.5	3.6 (0.8)	41,637
Daily smoker	**3.00 (1.65-5.45)**	7.4	10.6 (2.2)	26,048
Domestic or family violence				
Did not experience	1.0	3	4.1 (0.6)	119,119
Experienced in last year	**5.49 (2.93-10.3)**	17.6	14.3 (4.0)	17,142
Attitudes to gambling scale				
Positive	1.0	0.2	1.4 (0.5)	32,103
A bit negative	**2.85 (1.22-6.62)**	1.9	4.9 (1.4)	36,981
Somewhat negative	**5.62 (2.52-12.5)**	5.1	6.4 (1.5)	28,932
Most negative	**10.81 (4.67-25.0)**	11.4	8.2 (1.8)	37,939

Notes: **Bold font** indicates category of variable significant at p<0.05

Table 33 shows the final regression model for at least one harm form someone else's gambling. No socio-demographic or socioeconomic variables remained in the model. Poor self-assessed health daily smoking, experience of domestic/family violence, and having a negative attitude to gambling were all associated with increased odds of experiencing at least one gambling harm.

Table 33: Logistic regression model for <u>at least one harm</u> from someone else's gambling in last year, 2018 adult non-Indigenous population

	OR (95% CI)	Incidence rate	Harm % (SE)	Non-Indigenous Population (N)
NT NI adults	-	4.8	5.3 (0.7)	136,546
Self-assessed health				
Excellent	1.0	2.3	3.2 (1.2)	21,706
Very good	1.48 (0.60-3.70)	7.8	5.1 (1.3)	43,526
Good	1.10 (0.46-2.65)	1.6	3.9 (0.8)	50,089
Fair	1.74 (0.64-4.72)	4.3	7.2 (2.0)	16,700
Poor	**9.82 (2.80-34.4)**	26.5	27.9 (11.)	4,291
Smoking status				
Never smoker	1.0	4.6	4.3 (1.1)	68,848
Ex-smoker	0.94 (0.49-1.77)	3.5	3.6 (0.8)	41,637
Daily smoker	**2.46 (1.26-4.80)**	7.4	10.6 (2.2)	26,048
Domestic or family violence				
Did not experience	1.0	3.0	4.1 (0.6)	119,119
Experienced in last year	**2.49 (1.31-4.74)**	17.6	14.3 (4.0)	17,142
Attitudes to gambling scale				
Positive	1.0	0.2	1.4 (0.5)	32,103
A bit negative	**3.55 (1.47-8.60)**	1.9	4.9 (1.4)	36,981
Somewhat negative	**4.96 (2.06-12.0)**	5.1	6.4 (1.5)	28,932
Most negative	**6.16 (2.68-14.1)**	11.4	8.2 (1.8)	37,939

Notes: **Bold font** indicates category of variable significant at p<0.05

3.3 Incidence of total gambling-related harm in the NT adult population

3.3.1 Incidence of total gambling harms (own and others) by harm domain

Figure 31 shows the incidence of gambling harms for own, from others and the total gambling harms by harm domain for the NT. Among at-risk gamblers there was a total incidence of 599,508, while for harms from others gambling in the total adult population the incidence was 1,624,028, and the incidence of total gambling harms in the NT adult population was 2,223,536.

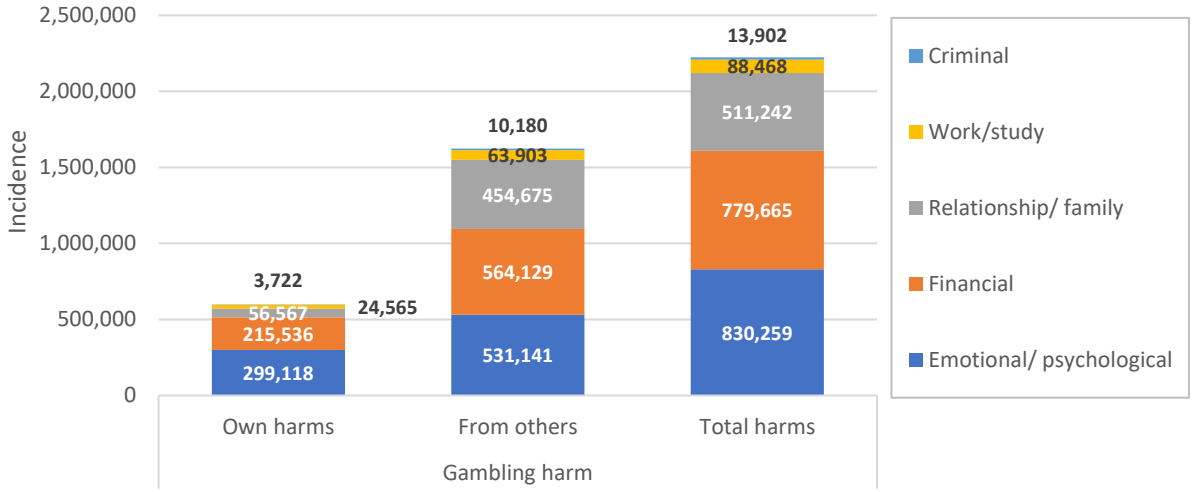

Figure 31: Incidence of harms from own gambling, someone else's gambling and all gambling-related harm, 2018 at-risk gamblers and total adult population

Figure 32 converts incidence into incidence rates for the total possible population for which harms were collected, which was all gamblers at-risk of problem gambling (N=25,852) for own harms, the total adult population (N=180,956) for harms from others gambling, and the total adult population for total gambling harms. The incidence rate PPPY was higher among the at-risk gamblers group own gambling harms, compared with the incidence rate for others gambling harm in the total adult population. The incidence rate PPPY for emotional/psychological harms was highest in the own gambling harms group (11.6), while for harms from others gambling financial harms had the highest incidence rate (3.1). Among at-risk gamblers, work/study harms were occurring around once per year, while criminal harms were just 0.14 incidents PPPY.

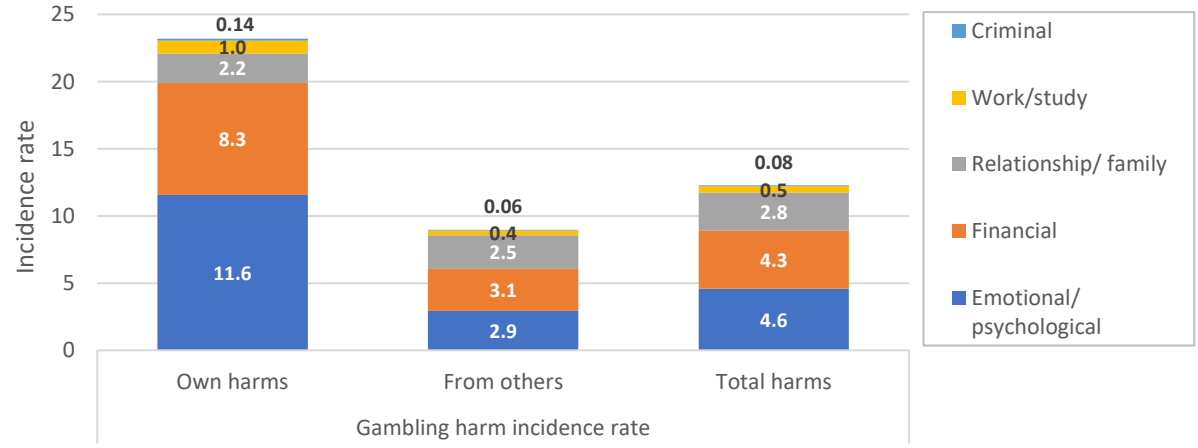

Figure 32: Incidence rate per person per year for harms from own gambling, someone else's gambling and all gambling-related harm, 2018 at-risk gamblers and total adult population

Notes: Incidence rate of own gambling harms is for the at-risk of problem gambling risk gamblers population (N=25,852), while incidence rate for harm from others and total gambling harm is for the total adult population (N=180,956)

Figure 33 and Table 34 shows the percentage distribution of harms across the different population groups and incidence rate. The emotional/psychological own gambling harms for at-risk gamblers made up around 50% of all own gambling harms, followed by financial harms (36%), relationship/family (9.4%), work/study (4.1%) and criminal harms (0.6%). For the population harmed by someone e4else's gambling, financial harms (35%) made up the largest percentage, followed by emotional/psychological (33%), relationship/family (28%), work/study (4%) and criminal harms (0.6%). Merging the incidence of gambling harms by domains to get total gambling harms sees emotional/psychological harms (37%) making up the largest proportion of total gambling harms, followed by financial (35%), relationship/family (23%), work/study (4%) and criminal (0.6%).

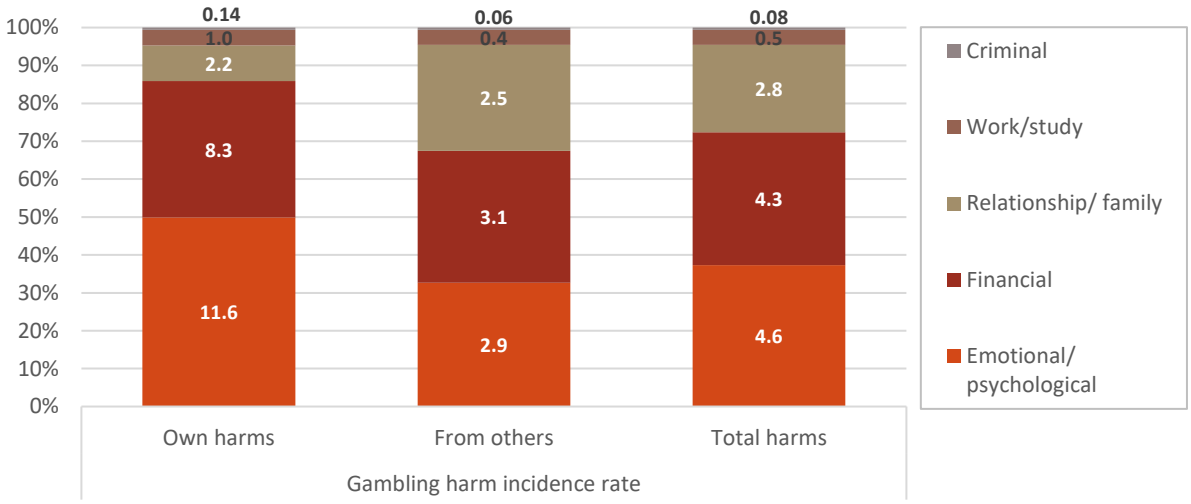

Figure 33: Incidence rate per person per year for harms from own gambling, someone else's gambling and all gambling-related harm by domain, 2018 at-risk gamblers and total adult population

Table 34 shows that across all gambling harm domains, the incidence rate PPPY of any type of harm for gamblers at-risk of problem gambling was 23.2, while for harm from others gambling in the total population it was 9, and for total gambling harms it was 12.3.

Table 34: Distribution of incidence rate across domains of gambling harm, total possible population

	Gambling harm incidence rate PPPY			% Distribution		
	Own	From others	Total	Own	From others	Total
Emotional/psychological	11.6	2.9	4.6	49.9	32.7	37.3
Financial	8.3	3.1	4.3	36.0	34.7	35.1
Relationship/family	2.2	2.5	2.8	9.4	28.0	23.0

Work/study	1.0	0.4	0.5	4.1	3.9	4.0
Criminal	0.14	0.06	0.08	0.6	0.6	0.6
Total	**23.2**	**9.0**	**12.3**	**100.0**	**100.0**	**100.0**

Using the total population for which a gambling harm occurs means that the incidence rate includes people who were not harmed by their own or others gambling at all, and will lower the incidence rate, as it is for the total population. Another way of calculating the incidence rate is to use just the population that experienced at least one harm from own gambling or one harm from someone else's gambling. Figure 34 shows the incidence rate using just the harmed population, and Table 33 shows these incidence rates alongside the total possible population incidence rates. Note that the percentage distribution across harm domains does not change as the same population denominator is used for each population group. Using just the harmed population sees that total incidence rate PPPY for gambling harm from others gambling increase dramatically from 9 to 111.8, while for own gambling harms it doubles from 23.2 to 52.9. The incidence rate PPPY for emotional/psychological own gambling harms amongst the population affected is now 26.4, followed by financial (19), relationship/family (5), work/study (2.2) and criminal (0.3). Financial harms had the highest incidence rate PPPY for harms from others gambling at 38.8 per person per year, followed by emotional/psychological (36.6), relationship/family (31.3), work/study (4.4) and criminal (0.7). So, for the total gambling harms emotional/psychological had the highest incidence rate PPPY at 34.7, followed by financial (32.6), relationship/family (21.4), work/study (3.7) and criminal (0.6).

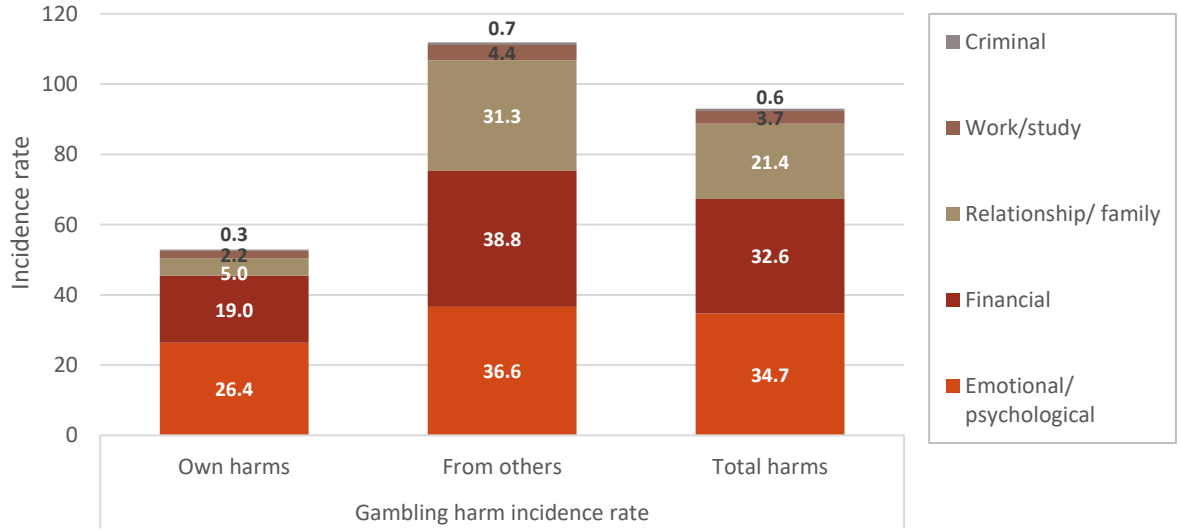

Figure 34: Incidence rate per person per year for harms from own gambling, someone else's gambling and all gambling-related harm by domain, 2018 at-risk gamblers and total adult population endorsing at least one harm

Notes: Incidence rate for own gambling harms is for the at-risk of problem gambling risk gamblers population endorsing at least one harm from own gambling (N=11,335), while incidence rate for harm from others gambling is based on total number of people endorsing at least one harm from others gambling (14,521) and incidence rate for total gambling harm is for the total adult population endorsing at least one harm from either own or others gambling harm (N=23,917)

Table 35: Distribution of incidence rate across domains of gambling harm, total possible population

	Gambling harm incidence rate PPPY in total possible population			Gambling harm incidence rate PPPY for population endorsing at least one harm		
	Own	From others	Total	Own	From others	Total
Emotional/psychological	11.6	2.9	4.6	26.4	36.6	34.7
Financial	8.3	3.1	4.3	19.0	38.8	32.6
Relationship/family	2.2	2.5	2.8	5.0	31.3	21.4
Work/study	1.0	0.4	0.5	2.2	4.4	3.7
Criminal	0.1	0.1	0.1	0.3	0.7	0.6
Total	**23.2**	**9.0**	**12.3**	**52.9**	**111.8**	**93.0**

3.3.2 Incidence of total gambling harms by problem gambling risk

Figure 35 shows the distribution of all gambling-related harms incidence (own and from others gambling) by problem gambling risk category, including non-gamblers. Non-risk gamblers experienced the most incidents of gambling-related harm (32%), followed by low risk gamblers (26%), high risk gamblers (19%), moderate risk gamblers (14%) and lastly, non-gamblers (9%).

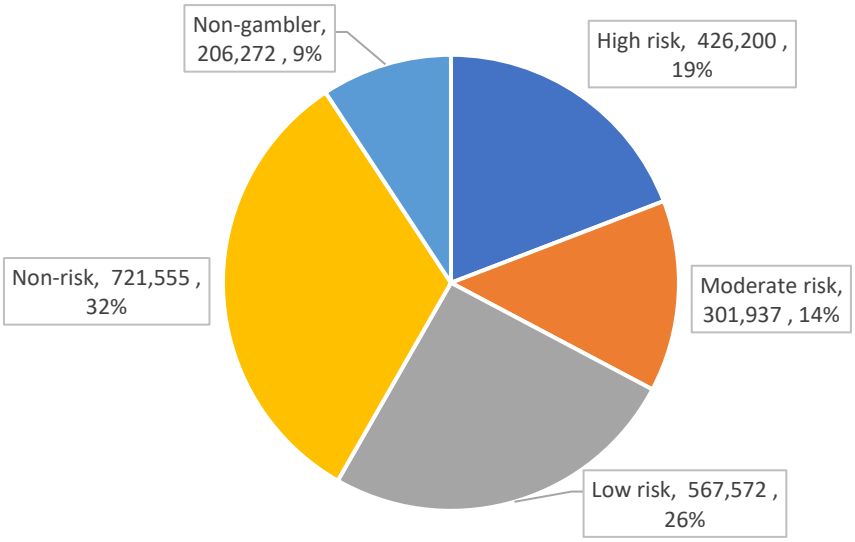

Figure 35: Distribution of incidence of total harms by problem gambling risk, 2018 total adult population

Victorian disability weights are applied to the NT population to calculate YLD associated with own gambling harm, harm from others gambling and these are then combined to get a total for the NT. Disability weights for own gambling harms from (Browne, Langham et al. 2016, p 132) are shown in Table 36, along with problem gambling risk estimates from the 2018 NT Gambling Prevalence and Wellbeing Survey, and the calculated YLD. The YLD is calculated by multiplying the total at-risk gamblers population (N=25,852) by the problem gambling risk proportion by the disability weight.

Table 36: Disability weights, problem gambling risk proportion, NT adult population and years of life lost to disability (YLD) associated with own gambling harms

	Population	Problem gambling risk	Disability weight	YLD	YLD %
Problem gambling	2,487	0.01375	0.44	156	21.2
Moderate risk	6,426	0.03551	0.29	266	36.1
Low risk	16,938	0.09360	0.13	315	42.7
Total at-risk	**25,852**	**0.14286**	**-**	**737**	**100.0**

For harm from others gambling, instead of using problem gambling risk, the prevalence of endorsing at least one harm from someone else's gambling is used, as well as a different disability weight (Browne, Langham et al. 2016, p 134). Calculation of YLD for harm from others gambling is shown in Table 37. The YLD is calculated by multiplying the total population (N=180,684) by the proportion harmed by someone else's gambling by the disability weight.

Table 37: Disability weights, harm from others gambling proportion, NT adult population and years of life lost to disability (YLD) associated with own gambling harms

	Population N	Harm from others gambling Proportion	Disability weight	YLD
Problem gambling	2,487	0.18241	0.22	7,251
Moderate risk	6,426	0.26470	0.22	10,522
Low risk	16,938	0.14941	0.22	5,939
Non-risk	103,681	0.07271	0.22	2,890
Non-gambler	51,423	0.04562	0.22	1,813
Total	**180,956**	**0.08060**	**0.22**	**10,643**[£]

£ Excludes problem and moderate risk gambling YLD as per Browne, Langham et al. (2016)

The distribution of harm by applying the disability weights from the Victorian study to the NT gambling prevalence data can be seen in the bars in Figure 36 labelled YLD (years lost to disability), while Table 38 shows the percentage distribution across problem gambling risk categories and non-gamblers for incidence and YLD. First looking at harms from own gambling on the left, gamblers at high risk of problem gambling experienced 1,093 YLD making up 21% of own gambling harms, while this group experienced 373,622 incidents of gambling harm from their own gambling making up 62% of the incidence of own gambling harms. YLD for gamblers at moderate risk of problem gambling made up 36% of all burden, compared with 28% of own gambling harm incidents, while for low risk gamblers, YLD made up 42% of total own gambling burden, compared with 10% of incidents. Looking at the bars associated with harm from others gambling the burden of disease modelling categorises a higher proportion of the burden in problem and moderate risk gambler groups. This is based on the prevalence of reporting of at least one gambling related harm in these groups

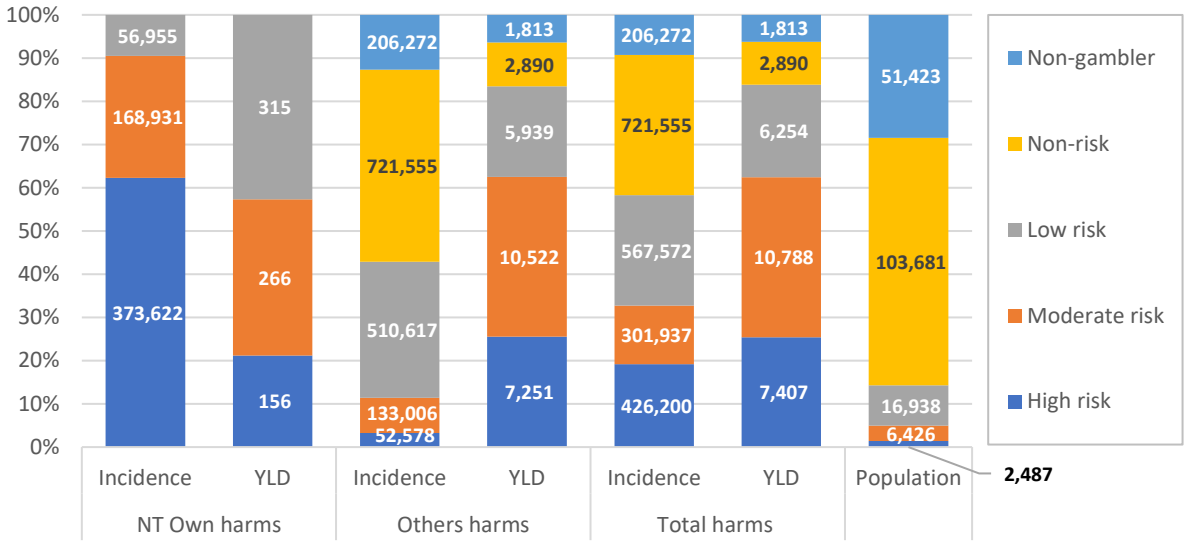

Figure 36: Distribution of incidence for own, others and total gambling harms, and years of life lost to disability (YLD)£ by problem gambling risk, 2018 at-risk gamblers and total adult population

£ Burden of Disease modelling weights for years lost to disability taken from Victorian study and applied to NT population: See Browne, Langham et al. (2016)

The fifth and sixth bars in the chart in Figure 36 show the distribution of total gambling harms for incidence and YLD. Incidence of harms and YLD for low risk gamblers comprised around 25% of the proportion of total harms, while high and moderate risk gamblers using YLD comprised 62% of YLD, compared with incidents of gambling harm for these categories making up 33%.

Table 38: Percentage distribution of incidents of harm and YLD for own gambling harm, someone else's gambling harm and total gambling harm, and population

	Harms from own		Harms from others		Total harms		
	Incidence %	YLD %	Incidence %	YLD %	Incidence %	YLD %	Population %
Problem gambling	62.3	21.2	3.2	25.5	19.2	25.4	1.4
Moderate risk	28.2	36.1	8.2	37.0	13.6	37.0	3.6
Low risk	9.5	42.7	31.4	20.9	25.5	21.5	9.4
Non-risk			44.4	10.2	32.5	9.9	57.3
Non-gambler			12.7	6.4	9.3	6.2	28.4
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

The pie chart in Figure 37 shows the difference between just measuring incidence of gambling harm, compared with calculating the incidence rate per person per year of gambling harm within the respective populations. High risk gamblers experienced very high incidence rates of gambling harm, with 171.3 per person per year, making up 65% of the total incidence rate of gambling harms, followed by moderate risk (18% with IR of 47.0), low risk (13% with IR of 33.5), non-risk (3% with IR 7.0) and non-risk (1% with IR of 4.0).

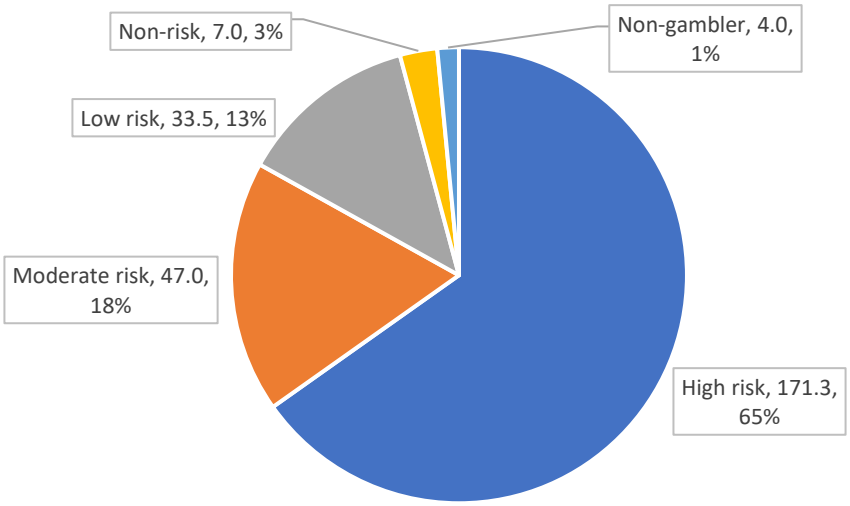

Figure 37: Distribution of incidence rate of total harms per person per year by problem gambling risk, 2018 total adult population

Notes: Incidence rate for own gambling harms calculated from at-risk gamblers population

4 DISCUSSION

The measurement and analysis of gambling-related harms is complex, with multiple factors involved in their interpretation and presentation.

4.1 Domains of own gambling harm: measuring incidence and distribution

The analysis of harms from own gambling by at-risk gamblers found 50% of the incidence of harms were emotional/psychological, followed by financial (36%), relationship/family (9%), work/study (4%) and criminal making up the smallest share at under 1%. The distribution of incidence of harms is likely affected by the number harms in each domain. Financial harms had the highest number of harm items at eight, while emotional/psychological, relationship/family and work/study domains each had three items, while criminal harms were only captured by one item, which would likely contribute to the lower prevalence and incidence of criminal harms. So, while the financial harms domain had the greatest number of items (8), it was the emotional/psychological harms domain that had the highest incidence of harms. Another possibility for the higher incidence for emotional/psychological is the potential for a low threshold when endorsing these harms, which may also be contributing to the higher incidence.

Incidence rates when calculated for the total at-risk gamblers population ranged from less than one per person per year for criminal harms, increasing to one per person per year for work/study harms, 2.2 per person per year for relationship/family harms, 8.3 per person per year for financial harms and was highest for emotional/psychological harms at 11.3 per person per year. These incidence rates are not particularly high, however, when constraining the population to only those affected by at least one harm from the domain, they increase dramatically for this harmed population. Financial harms now have the highest incidence rate per person per year at 39.7, relationship/family harms were second highest at 33.7, followed closely by emotional/ psychological harms at 32.4, criminal at 23.3 and work/study at 18.6. so, of the 5,425 at-risk gamblers experiencing at least on financial harm, the rate indicates that these harms are occurring 40 times per year. The analysis shows that the at-risk gamblers experiencing harm from their own gambling, are carrying a large burden of harm.

It is recommended that health promotion focus on the harms arising from gambling and how these harms impact the gambler and their broader social networks. For example, do you run short of money for essentials because of your gambling? In 2018m over 5,000 gamblers indicated they experienced a financial related harm 40 times in the past year.

4.2 Incidence of gambling own gambling harms by problem gambling risk and activities

Incidence rates of own gambling harm domains all increased with increasing problem gambling risk with this association being highly statistically significant. Gamblers experiencing problem gambling had incidence rates 228 higher for relationship/family harms in this group compared with gamblers with a low risk of problem gambling, 43 times for emotional/psychological harms, 45 times for financial harms and 26 times for criminal harms. Of concern, was that when creating a higher risk group of problem gambling (score 14 or more), the incidence rates continued to rise, with rates among

this very high-risk group more than 100 per person per year for financial and emotional/psychological harms.

It is recommended that more health promotion and public health materials be developed such as posters, highlighting the high levels of harm types, and these be placed in view of gamblers in venues.

The association between incidence of harm from own gambling and EGM gambling frequency was statistically significant for financial and emotional/psychological harm domains, with weekly EGM gamblers having incidence rates over 11 times higher than non-EGM gamblers, and nearly eight times higher for financial harms. Weekly sports betting was significantly aswsocited with higher incidence of financial harms, compared with non-sports bettors, while for racetrack bettors weekly and monthly gambling was significantly associated with increased incidence of financial harms (3.5 and 5.6 respectively).

It is recommended that health promotion materials highlighting the trisk of experiencing harms directly related to their gambling on or near EGM rooms and other areas in venues where people gamble (e.g. TAB sections).

4.3 Harm domains from someone else's gambling: Prevalence and incidence

Around 8% or 14,500 NT adults indicated that they were negatively affected by someone else's gambling, and over half of these affected others endorsed three or more harms. Gamblers at risk of problem gambling were significantly more likely to be harmed by someone else's gambling, reflecting social networks of this group, and the increased likelihood of associating with other at-risk gamblers. Thirty-five percent of harms from others gambling were financial harms, followed by 33% for emotional/psychological, 28% for relationship family, 4% work/study and less than 1% for criminal harms. In the total adult NT population incidence rates per person per year were relatively low ranging from less than 1 for criminal and work/study harms, to 3.1 for financial harms. These are somewhat misleading as they include the total population, regardless of whether a harm was endorsed, and incidence rates were also calculated for the affected population endorsing at least one harm form the domain. Incidence rates rise dramatically and range between 61 and 64 times per year for financial, emotional/psychological and relationship family harms. In total there were 9,275 people affected by a financial harm because of someone else's gambling on average 61 times per person per year, 8.340 people experiencing an emotional/psychological harm on average 64 times, and 7,165 people experiencing a relationship/family harm on average 63 times. These rates are high among the group of people harmed from someone else's gambling, and indicate that every week or most weeks, these people experience harm from someone else's gambling.

Separate multivariable models were developed for the Aboriginal and non-Aboriginal populations due to interactions between Indigenous status and a range of variables remaining significant in the models. This was justified as there were differences in significant correlates for the two populations. For the Aboriginal population a range of socio-demographic, socioeconomic and health risk factors were significantly associated with harm form someone else's gambling in multivariable models. Significant correlates of incidence of harms were being aged between 30 and 65 years, living in a single person household, ex- and daily smokers, and people who held a negative attitude towards gambling as measured on the Attitudes to Gambling

Scale. In other models exploring number of different harms and endorsing at least one harm use of cannabis or cocaine in the last year, and people living in Alice Springs and regional towns (compared with Darwin/Palmerston).

For the non-Indigenous population significant correlates of incidence of harm from someone else's gambling were being a FIFO/DIDO worker, not in the labour force, earning between $50,000 and $99,999 per annum, experiencing moderate or high psychological distress, experienced domestic/family violence in the last year, and having a negative attitude towards gambling. In all multivariable models domestic/family violence was significantly associated with harm from someone else's gambling, and while the direction of this association cannot be ascertained from cross-sectional data, it provides some evidence that gambling is likely contributing to excess domestic/family violence in the NT.

It is recommended that gambling-related harms be screened for in those people seeking refuge from domestic/violence and that health promotion to destigmatise help-seeking associated with gambling-related problems and domestic/family violence.

4.4 Limitations

There are several limitations to the analyses of the measurement of gambling harms contained in this report. First, the gambling harms list was developed by Delphi method, as opposed to a larger study talking with gamblers and affected others (for example see Langham, Thorne et al. (2016)). However, prevalence estimates obtained from the 2015 and 2018 NT gambling prevalence surveys are consistent with similar items developed by Browne and colleagues and used in the Short Gambling Harm Screen (Browne, Goodwin et al. 2017, Browne, Volberg et al. 2020).

The high number of items captured in the financial harms may contribute to higher incidence and prevalence in this domain. How to standardise measurement across domains with varying number of items is a challenge, with no parsimonious approach available. The additive approach used to determine domain incidence may need further refining, with weights applied depending on the severity or cost of the harm, but again., how to decide on what these weights are is a challenge. The exploratory factor analysis of individual harms may provide some guidance, though weighting from this analysis is based on mathematical linear relationships, and not rooted in the severity of the harm. Clearly some harms are more severe than others, but these former may occur less often, while others less severe may be more regularly occurring, such as money shortages for essentials. Additionally, the measurement of criminal harms requires further refinement and likely requires more targeted harms, rather than the generic 'did something illegal'. A possible approach may be to use offences like those used in the police classification system and could be adapted to for example 'stole from a business', 'stole from a supermarket', 'stole from a person' and 'break and enter'.

The list of harms used in the 2015 and 2018 surveys was fixed in order, which may have impacted some estimates due to respondent fatigue and could be mitigated through a randomisation of the order of items between respondents when administering the survey.

4.5 Conclusions

Gambling-related harms on affected gamblers and affected others are significant and common across emotional/psychological, financial, and relationship/family harms, with less work/study and criminal harms in the NT adult population. How much these harms cost is being investigated in another report and show that in the NT at the low end are costing between $164.9million and $381.3 million per year in 2018 dollars. How to address and reduce harms associated with gambling will require buy in from government, industry, treatment services for addictive behaviours and the broader community. A comprehensive public health approach is required including sustainable funding of health promotion campaigns using information on harms to educate gamblers and affected others on how their gambling impacts themselves and others.

REFERENCES

Afifi, T. O., D. A. LaPlante, T. L. Taillieu, D. Dowd and H. J. Shaffer (2014). "Gambling involvement: Considering frequency of play and the moderating effects of gender and age." International Journal of Mental Health and Addiction **12**(3): 283-294.

Browne, M., B. C. Goodwin and M. J. Rockloff (2017). "Validation of the Short Gambling Harm Screen (SGHS): A Tool for Assessment of Harms from Gambling." Journal of Gambling Studies: 1-14.

Browne, M., N. Greer, T. Armstrong, C. Doran, I. Kinchin, E. Langham and M. Rockloff (2017). The social cost of gambling to Victoria. Melbourne, Victorian Responsible Gambling Foundation.

Browne, M., E. Langham, V. Rawat, N. Greer, E. Li, J. Rose, M. Rockloff, P. Donaldson, H. Thorne, B. Goodwin, G. Bryden and T. Best (2016). Assessing gambling-related harm in Victoria: A public health perspective Melbourne, Victorian Responsible Gambling Foundation.

Browne, M., V. Rawat, N. Greer, E. Langham, M. Rockloff and C. Hanley (2017). "What is the harm? Applying a public health methodology to measure the impact of gambling problems and harm on quality of life." Journal of Gambling Issues(36): 28-50.

Browne, M., R. Volberg, M. Rockloff and A. H. Salonen (2020). "The prevention paradox applies to some but not all gambling harms: Results from a Finnish population-representative survey." Journal of Behavioral Addictions **9**(2): 371-382.

Canale, N., A. Vieno and M. D. Griffiths (2016). "The extent and distribution of gambling-related harms and the prevention paradox in a British population survey." Journal of Behavioral Addictions.

Dowling, N. A., A. C. Jackson, S. A. Thomas and E. Frydenberg (2010). Children at risk of developing problem gambling. The Problem Gambling Research and Treatment Centre. Melbourne.

Hare, S. (2015). Study of Gambling and Health in Victoria. Melbourne, Victorian Responsible Gambling Foundation and Victorian Department of Justice and Regulation.

Langham, E., H. Thorne, M. Browne, P. Donaldson, J. Rose and M. Rockloff (2016). "Understanding gambling related harm: A proposed definition, conceptual framework, and taxonomy of harms." BMC Public Health **16**(80): 1-23.

Marmot, M. and R. G. Wilkinson (1999). Social Determinants of Health, Oxford University Press.

Marshall, D. (2009). "Gambling as a public health issue: The critical role of local environment." Journal of Gambling Issues(23): 66-80.

Okoli, C. and S. D. Pawlowski (2004). "The Delphi method as a research tool: an example, design considerations and applications." Information & Management **42**(1): 15-29.

Productivity Commission (2010). Gambling: Productivity Commission Inquiry, Volume 1, Report No. 50. Canberra, Australian Government.

Stevens, M. and R. Bailie (2012). "Gambling, housing conditions, community contexts and child health in remote Indigenous communities in Australia." BMC Public Health **12**: 377.

Stevens, M., H. Gupta and M. Flack (2020). Northern Territory Gambling Prevalence and Wellbeing Survey Report, 2018. Darwin, Menzies School of Health Research & the Northern Territory Government.

Stevens, M., M. Thoss and T. Barnes (2017). 2015 Northern Territory Gambling Prevalence and Wellbeing Survey Report. Darwin, Menzies School of Health Research & the Northern Territory Government.

Suomi, A., A. Jackson, N. Dowling, T. Lavis, J. Patford, S. Thomas, P. Harvey, M. Abbott, M. Bellringer, J. Koziol-McLain and S. Cockman (2013). "Problem gambling and family violence: Family member reports of prevalence, family impacts and family coping." Asian Journal of Gambling Issues and Public Health **3**(1): 13.

World Health Organisation (2009). Global estimates of burden of disease caused by environmental risks. Geneva, World Health Organisation.

Young, M., I. Abu-Duhou, T. Barnes, E. Creed, M. Morris, M. Stevens and B. Tyler (2006). Northern Territory Gambling Prevalence Survey, 2005. Darwin, School for Social and Policy Research, Charles Darwin University.