2 SURVEY METHODOLOGY AND ACCURACY

An overview of the 2015 Gambling Prevalence and Wellbeing Survey methodology is contained in this chapter, with Appendix A containing detailed information on the survey methodology. A pilot study was conducted 8-12 October, while the main survey was carried out between 19 October and 23 December 2015.

2.1 Survey development and information collected

After being approached to do the survey, Menzies School of Health Research put together a discussion paper that outlined issues associated with conducting a prevalence surveys in the NT, along with a table listing questions used in the previous survey and a column identifying whether they are likely to be included in the 2015 survey and additional questions for inclusion. A Survey Reference Group was set up to oversee the survey, which included members from the NTG, Charles Darwin University (The Northern Institute and the School of Psychological & Clinical Sciences), Amity Community Services (primary gambling counselling service) and Menzies. Two versions of this discussion paper were produced, one for the Survey Reference Group, and the other for distribution to stakeholders such as non-government (gambling and counselling) service providers and industry. After receiving feedback from stakeholders and convening two Survey Reference Group meetings, the following information domains and data items were selected for inclusion in the 2015 survey.

Domain	Data items
Socio-demographic factors	Region, NT residency status (for scope), age, gender, Indigenous status, main language spoken at home, and household type.
Socioeconomic factors	Highest education, labour force status, personal income, Fly-in Fly-out and Drive-in Drive-out employment, student status, and SEIFA (area level socioeconomic status derived from postcode data).
Gambling participation and highest spend activity	Participation, frequency of play, and where/how gambled for EGMs (pokies), racetrack betting, instant scratch tickets, keno, lotteries, bingo, casino table games, sports betting, non-sports betting, raffles/sweeps/SMS competitions, informal private games, and highest spend activity and average spend per session.
Problem gambling	The Problem gambling Severity Index (PGSI in original format)
EGM player preferences, in-venue policy, and community opinions on EGM numbers	Regular venue where plays EGMs, distance to regular EGM venue, impact of smoking ban on EGM spend, impact of placing ATMs out of sight of gaming area on EGM spend, and whether should be increase in EGMs (casino, hotels, clubs separately).
ATM access and in-venue approach by staff for at-risk gamblers	Access to ATM in a gambling session, how often usually accesses ATM in gambling session, whether staff member of venue ever checked if okay while gambling

Domain	Data items
Negative consequences from own (for at-risk) and another person's gambling and help-seeking behaviour	Ran out of money for rent or mortgage, ran out of money for food, ran out of money for bills, raided savings account, borrowed money, debt collectors repossessed something, sold/hocked possessions, relationship problems with family, relationship problems with friends, physical or verbal violence towards you, kids did not attend school, kids missed out on something, felt stress/anxiety/ depression, did something outside the law, work problems, and whether sort help and where got help. For those negatively affected by another person's gambling, the relationship they had to the person who's gambling was affecting them, and the same set of negative consequences and help-seeking behaviour questions.
Gambling motivations	Motivations for gambling: 18 questions covering excitement, escape ego, money, and social
Health and health risk factors, and social and emotional wellbeing,	Self-assessed health, smoking status, smoke-free home status, Exposure to personal stressors (serious illness or disability, serious accident, death of family member or close friend, mental illness, not able to get a job, lost job, alcohol-related problem, drug-related problem, witness to violence, abuse or violent crime, trouble with police, gambling problems and racial/ethnic discrimination).

2.2 Survey scope and sample design

As with most gambling prevalence surveys in Australia, telephone sampling using CATI was used to collect information from NT resident adults (18 years and over). The same survey company that did interviewing for the 2005 survey, Roy Morgan Research (RMR), were the preferred provider for the 2015 survey. Originally, a sample size of 4,000 was considered large enough to produce robust estimates; however, after a month of fieldwork, we noted that the average interview length, at 10 minutes, was shorter than expected, so the sample was increased to 5,000. A stratified sampling approach using region (Darwin/Palmerston, Alice Springs, Katherine, Tennant Creek/Nhulunbuy and the Rest of NT), gender (male, female) and age (18-34, 35-49, 50-64 and 65 or more years), was used, with broad Territory wide proportional quotas set for region, age and gender.

To ensure the survey captured a representative sample of the adult population in the NT, dual frame sampling was preferred, and is now the method most widely used for gambling prevalence surveys in Australia. Mobile phone numbers were obtained from three separate lists (one owned by RMR and the other two purchased from private providers), in addition to the landline telephone frame owned by RMR. For the mobile sample, the interview was conducted with the person who answered the phone, but for the landline sample, the last birthday method for selecting one person from a household was used, though later in the fieldwork this was changed to ask for the male with the most recent birthday, as too few males were being interviewed.

The survey contained three sets of questions, with respondent's being filtered through to different questions, depending on whether they were a:
  (i)   no-risk gambler verse at-risk gambler
  (ii) EGM verse non-EGM gambler, or
  (iii) no-risk gambler or non-gambler verse at-risk gambler.

The first two sets of questions filter respondents to allow specific questions to be asked of at-risk gamblers (negative consequences of their own gambling and help-seeking behaviour) and EGM gamblers (questions about regular venue attendance, and effect of EGM policy on their gambling). The third minimises the average interview length (and survey cost). Specifically, it allocates one in four no risk (screened according to the PGSI) and non-gamblers (by gender) to receive the full survey, while all at-risk gamblers received the full survey.

2.3 Consent rate

Over 330,000 phone calls were made during the fieldwork period, with up to five calls made on a single number in order to establish contact, and up to five once contact had been made (unless there was an outcome such as being a fax number, business phone number or not being connected). Most completed interviews were achieved within three phone calls, with 89% of landline and 80% of mobile interviews completed in three calls. After one week of interviewing, the introduction was modified to try to improve consent rates, which were around 25% (landline only) at this stage. The changes emphasised that the survey was very important and was on behalf of the Northern Territory Government, after which, consent rates hovered at or just under 30%.

From the 330,000 plus calls made, 148,288 landline and 9,582 mobile numbers were included in the phone number frame. Just over half (50.5%) of landline numbers were unobtainable/not connected, a further 0.5% were on the Roy Morgan list of not ever to be called and another 3.8% were modem or fax numbers. From 67,124 useable landline line numbers, contact was made with 26,550 with 34,419 being no answer and 5,152 answering machines. Of the 26,550 landline numbers where some form of contact was made, 37% were unusable (31.1% business numbers, and 5.8% failed screener questions). Refusals accounted for 36.2% of contacts and completed interviews accounted for 14.2% of contacts. Of the 9,582 mobile numbers called, 8,494 turned out to be usable (9.2% not connected/obtainable and 1.1% on the Roy Morgan list not ever to be called), with contact made with 4,156, though 20.3% of these failed the screener questions, failed quotas or were otherwise out of scope. Refusals accounted for 36% of contacts and completed interviews accounted for 28.5% of contacts.

In total 4,945 participants completed the survey. Most respondents (76%, 3,760 people) who completed the survey were contacted by landline, while 24% (1,185) were contacted by mobile. Of the 1,185 people contacted by mobile, 60% (712) had mobile and landline numbers, and the remainder were mobile only (473).

The consent rate using the formula:

consent rate = consents/(consents + refusals) x 100

for landlines was 28%, and 44% for mobile phones, with an overall consent rate of 31%. Including other in-scope contacts (i.e. language/hearing difficulty terminations, other terminations and refusals) in the denominator, the consent rates drop to 22% and 37% for landline and mobiles respectively, with an overall consent rate of 25%.

2.4 Population weights

To improve the accuracy of estimates from population surveys, raw data is usually 'weighted' to the total population. Population weights most often adjust for age, gender and regional population distributions, using estimated resident population counts generated by the Australian Bureau of Statistics (Australian Bureau of Statistics 2016a). The weights ensure that survey estimates are more representative of the NT population (by age, gender and region for example).

The final weighting design for the 2015 survey was developed by RMR following discussions between Bruce Packard (RMR), Matt Stevens (Menzies), Tony Barnes (NTG and Charles Darwin University) and Sarah Hare (Schottler Consulting). The weighting approach used for the current survey is an improvement on the approach used in the 2005 survey, with two main differences. The first difference being that separate weights were developed for Indigenous and non-Indigenous samples. This is more important in the NT compared with other jurisdictions, as the Indigenous population make up nearly a quarter of the total adult population, and experience more gambling related harms and socioeconomic disadvantage relative to the non-Indigenous population (Australian Bureau of Statistics 2015, 2016b, Stevens & Paradies 2014, Stevens & Young 2009a, Stevens & Young 2009b). The second difference is that the weights take into account the differing probabilities of selection between the landline and mobile samples, in addition to age, gender, and region. A separate set of weights was also required for respondents receiving the full survey (including separate weights for Indigenous and non-Indigenous samples). This set of weights make proportional adjustments for the one in four sampling of no risk and non-gamblers that received the full survey. Appendix A contains the full technical specifications and formulas used in creating population weights for the 2015 survey.

2.5 Sample characteristics

Appendix B contains a table with the distribution of unweighted and weighted survey data for key demographic and socioeconomic variables, and provides some information on the accuracy and reliability of the sample. The following points summarise the characteristics of population segments that were under-sampled:

- Living in very remote parts of the NT, which includes Regional Towns and the Rest of the NT
- Between 18 and 35 years
- Males
- Indigenous, particularly in the Rest of NT region
- Full-time students
- Year 10 or below highest education
- Annual gross income $30,000 to $49,000

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The population weighting will correct for region, age, gender and Indigenous population sample distributions, with the assumption that the sample is broadly representative within these population segments. The assumption that the Indigenous sample of the 2015 survey is broadly representative of the NT Indigenous adult population will be further explored in a follow-up analysis and report. It is likely that Indigenous people living in remote communities across the NT were not included in the sample, due to a lack of a landline telephone in houses. While untested, it may also be that Indigenous people with a mobile phone living in communities are not on the mobile sampling lists. Follow-up analyses will include a comparison with Australian Bureau of Statistics survey data from the 2014/15 National Aboriginal and Torres Strait Islander Social Survey on phone access and other demographic and socioeconomic variables to assess reliability of the Indigenous sample.

2.6 Data analysis and reporting

2.6.1 Data sources

All data, except that contained in Chapter 10 is from either the 2005 Gambling Prevalence Survey or the 2015 Gambling Prevalence and Wellbeing Survey. Chapter 10 contains electronic gaming machine (EGM) data sourced from the NTG Department of Business, and includes player losses (including CPI adjusted data) and number of EGMs.

2.6.2 Data cleaning and management

RMR provided the data in SPSS format, which was converted to Stata format for analyses using Stata statistical software (StataCorp 2015). Population weight variables and strata (age, gender and region) were set up within Stata using the SVY commands, which ensures estimates (and standard errors) take into account the sample design. Exploratory data analysis was carried out to determine cut-points for continuous or semi-continuous variables, and identify outliers or mistakes in the data. For example, annual/weekly gambling frequency was converted to an ordinal variable with categories (1) 1 or more times per week, (2) 1-3 times per month, and (3) Less than monthly per year.

Personal income data was imputed with the Stata 'impute' command for 16% (unweighted) of respondents with missing data (using variables that had a strong correlation with personal income). Some extreme outliers were identified in the expenditure (player loss) data associated with highest spend activity and an examination of these extreme values indicated that they were a result of mistakes in data entry, and these were consequently adjusted accordingly (e.g. extra digit in record for how much they usually spend when the gamble). Additionally, for questions identifying negative consequences of gambling for both at-risk, and for those affected by another person's gambling, 'other' responses were re-coded back into available responses where appropriate.

There was a problem with the filtering of respondents through the help-seeking behaviour questions for at-risk gamblers. Of the 408 unweighted (20,717 weighted) at-risk gamblers, only 207 (9,341 weighted) were asked whether they sought help because of their gambling, and only 6 (437 (4.7%) weighted) at-risk gamblers answered 'yes' to seeking help.

2.6.3 Statistical tests between 2015 variables and with the 2005 survey

Statistical tests of association between variables (e.g. gambling participation and age) were determined using Chi Squared Tests of Independence. For comparisons between 2005 and 2015 survey estimates, comparable variables from the 2005 survey were appended to the 2015 survey data, which then enabled Chi Squared Tests of Independence to be used in determining significant differences between estimates from the two surveys.

The different approach to weighting the data in the 2015 survey does affect statistical comparisons with the previous survey. In the 2005 survey, the Indigenous sample was not weighted separately, therefore under-representing responses from Indigenous respondents. However, if we exclude the Indigenous sample from the 2005 survey, then estimates for non-Indigenous respondents will be over-represented in the population. The population weights for the Indigenous population in the 2015 survey mean that differences in characteristics (e.g. socioeconomic disadvantage) between the Indigenous and non-Indigenous populations become more pronounced, while in the 2005 survey, the converse applies. There is no right or perfect way to deal with these methodological differences, and additional analyses will be carried out at a later date that focusses on Indigenous and non-Indigenous sample comparisons in the 2015 survey, and exploring options for comparing the Indigenous sample of the 2005 survey with that of the 2015 survey.

All analyses in this report use weighted data, with standard errors adjusted for the stratified survey design using Stata's SVY commands. A note under tables where relative standard errors were large (i.e. 25% or more), advises caution in interpreting estimates. Asterisks denote the statistical significance of associations throughout the report using the following convention: *** $p<0.001$, ** $p<0.01$, * $p<0.05$.