Australian Government
Australian Institute of Family Studies

AIFS

Optimising survey design for a national gambling prevalence study

Insights from the National Gambling Prevalence Study Pilot

Gabriel Tillman, Mikayla Budinski, Sethini Wickramasinghe, Tanvi Pappu, Louis Kling, Nancy Greer, Barbara Whitlock and Kei Sakata

Australian Gambling Research Centre, Australian Institute of Family Studies

Sensitive content warning

This content discusses gambling harm and addiction, if you or someone you know is experiencing gambling-related issues call Gambling Help on 1800 858 858 or visit their website to chat with a trained professional.

This content discusses self-harm and suicide. If you or someone you know is in crisis, call Kids Helpline on 1800 55 1800 or Lifeline on 13 11 14. Both are available from anywhere in Australia 24 hours a day (toll free) and provide generalist crisis counselling, information and referral services.

The Suicide Call Back Service, 1300 659 467, offers free professional 24/7 telephone counselling support to people at risk of suicide, concerned about someone at risk, bereaved by suicide or experiencing emotional or mental health issues.

This content addresses domestic and family violence. Please take care while reading and if you think you would benefit from some support, call 1800 RESPECT – 1800 737 732 for 24-hour information and support.

Call Police on 000 any time you are worried about your safety or the safety of another person.

Acknowledgements

The Australian Gambling Research Centre (AGRC) was established under the Commonwealth *Gambling Measures Act 2012*. Our gambling research program reflects the Act, embodies a national perspective and has a strong family focus. Our work forms part of the functions of the Australian Institute of Family Studies (AIFS). This manuscript was refined with the assistance of Microsoft Copilot, an AI-powered tool that supported language and clarity improvements throughout the drafting process.

The Australian Institute of Family Studies acknowledges the Traditional Owners of Country throughout Australia and recognises their continuing connection to lands and waters. We pay our respects to Aboriginal and Torres Strait Islander cultures, and to Elders past and present.

Contents

Abbreviations/acronyms

Acronym/Abbreviation	Full form/Description
AAB	Average absolute bias
A-BS	Address-based sampling
ABS	Australian Bureau of Statistics
ACMA	Australian Communications and Media Authority
AAPOR	American Association for Public Opinion Research
AGRC	Australian Gambling Research Centre
AUDIT-C	Alcohol Use Disorder Identification Test - Consumption
CAWI	Computer-assisted web interviewing
CAPI	Computer-assisted personal interviewing
CATI	Computer-assisted telephone interviewing
CPC	Cost per complete
EGMs	Electronic gaming machines
GREG	Generalised regression
IPND	Integrated Public Number Database
LinA	Life in Australia™ (Panel)
LMG	Lindeman–Merenda–Gold method
PGSI	Problem Gambling Severity Index
RDD	Random digit dialling
SMS	Short message service
SRC	Social Research Centre
VALI	Video-assisted live interviewing
VIF	Variance inflation factor

Executive summary

Key messages

- **Australia does not currently have a routine national gambling prevalence study.** Existing state, territory and occasional national studies use different methods and are conducted at different times, limiting the ability to track gambling participation and harm consistently across Australia over time. Recognising this gap, the parliamentary inquiry into online gambling *'You win some, you lose more'* recommended ongoing funding for prevalence studies to understand the extent of gambling harm in Australia (House of Representatives Standing Committee on Social Policy and Legal Affairs, 2023).
- **The National Gambling Prevalence Study Pilot is the first attempt to establish a nationally representative gambling prevalence study in Australia.** Conducted in 2024 by the Australian Gambling Research Centre (AGRC) at the Australian Institute of Family Studies (AIFS), the Pilot was designed to test whether consistent national data on gambling participation and harm can be collected in a rigorous, affordable and repeatable way.
- **Survey design matters.** Methodological choices about survey methods, recruitment strategies and survey names can significantly affect estimates of gambling participation and harm.
- **A mixed-mode approach offers the best balance of rigour and affordability.** Combining survey modes can reduce bias and improve representativeness while costing substantially less than traditional telephone-only approaches.
- **The Pilot provides a practical blueprint for an ongoing national gambling prevalence study.** It demonstrates how Australia could collect consistent national data to monitor trends, evaluate policy reforms and better understand gambling-related harm over time.

Background

Australia's gambling landscape is changing rapidly, particularly with the growth of online wagering, changing gambling products and ongoing harm-reduction reforms. An ongoing, methodologically consistent national gambling prevalence study is needed to monitor these changes, evaluate policy impacts and provide comparable evidence to guide future reforms.

In 2024, the Australian Gambling Research Centre (AGRC) at the Australian Institute of Family Studies (AIFS) conducted a National Gambling Prevalence Study Pilot ('the Pilot'). The Pilot examined the most cost-effective and methodologically rigorous approach to running an ongoing gambling prevalence study. The subsequent prevalence data collected using the Pilot are reported in a separate Key Findings report (Tillman et al., 2025a). These cover gambling participation, harm, mental health, intimate partner violence and finances.

This report identifies a methodologically rigorous and cost-effective design for an ongoing national gambling prevalence study. While the report does not seek to harmonise all existing state and territory studies, it provides evidence on survey design features that could support greater consistency and comparability in future prevalence research.

Methods

The Pilot used a partially crossed factorial survey design to test how different sampling frames, survey methods and survey names influenced gambling prevalence estimates. Respondents were recruited through 3 probability-based sampling frames: random mobile numbers, address-based sampling and the Life in Australia™ online panel. Respondents completed the survey either by telephone or online, depending on the recruitment pathway (see Methodology section for further details).

For the Pilot, 3,881 Australians over the age of 18 were recruited via 4 survey modes:

- dialling random mobile numbers to invite potential participants to a phone survey (CATI)
- sending SMS invitations to random mobile numbers to complete the survey online (SMS)
- sending invitations in the mail to a random sample of addresses using address-based Sampling (A-BS), where participants complete the survey online
- sending invitations to an existing probability-based online panel (Life in Australia™) to complete the survey online (LinA).

All respondents were randomly assigned to receive an invitation to a survey named as either a 'gambling' or 'health' survey, with the survey content identical.

Key findings

Methodological choices about survey methods and names can impact the accuracy and quality of gambling prevalence data, which guides gambling policy and public understanding.

- There are differences in the overall prevalence estimates based on how participants were recruited and how participants provided their responses.
  - Respondents who received a 'gambling' framed invitation reported higher levels of gambling participation and gambling harm rates than those who received a 'health' framed invitation.
  - Compared with CATI, A-BS produced higher gambling participation, while SMS and A-BS produced higher gambling harm scores.
  - Compared with CATI, online surveys produced higher online gambling participation.
- Survey method and name effects are likely to reflect both participation and response effects.
  - The 'gambling' framed invitation modes were more likely to include people with higher gambling involvement and gambling-related risk compared to 'health' survey invitations.
  - Online completion modes were more likely than CATI to include people who gamble online.
  - CATI may increase social desirability bias because it involves a human interviewer, potentially contributing to lower reporting of gambling harm.[1]
- Attribution of harm to specific gambling activities was not substantially affected by survey method. Electronic gaming machines (EGMs) accounted for the largest share gambling harm, followed by wagering activities.
  - EGMs consistently accounted for the largest share of explained variance (34.2%–46.2%) in gambling harm, followed by wagering activities (27.9%–36.5%).
  - Poker, keno, scratch tickets, casino table games and bingo ranked next but added relatively smaller contributions. Lottery had negligible contributions to harm.
  - Although effect sizes varied by survey mode, the overall ranking remained consistent.
- Mixed-mode reduced overall bias and lowered costs.
  - A-BS, SMS and panel-based survey modes were more cost-effective than CATI but each mode introduced its own unique biases. The cost per complete (CPC) for the online panel was only 14% that of CATI, SMS was 20% and A-BS was 28%.

[1] See Heirene et al., 2025; Sturgis, 2020; Sturgis et al., 2025.

  - A blend of 60% CATI, 29% SMS and 11% A-BS achieved the lowest average absolute bias (AAB = 2.64 percentage points) at 67% the cost of CATI alone.
  - The best value for money was a blend of 40% CATI and 60% A-BS at a cost of 57% of CATI alone and an AAB of 2.67.
- A future ongoing national gambling prevalence study could use mixed-mode to balance cost, representativeness and methodological rigour.
  - Among the survey modes modelled in the Pilot, mixed-mode provided the best balance of cost and representativeness.
  - The Pilot findings can be used to help researchers and policy makers undertake prevalence surveys within tight budget constraints.

Introduction

Australians collectively lose $32 billion on legal forms of gambling annually (Queensland Government Statistician's Office, 2025), the largest per capita losses of any country in the world (H2 Gambling Capital, 2025).

In the 12 months prior to October 2024 (Tillman et al., 2025a), 65% of Australians gambled at least once and 15% were at some risk of gambling harm. Compared to non-risk gamblers, high-risk gamblers reported higher rates of cognitive, behavioural or mental health conditions (68% vs 6%), suicidal thoughts (16% vs 4%) and severe financial hardship, such as going without meals (66% vs 16%). Alarmingly, 19% of those whose current partner gambled weekly or more experienced intimate partner violence, compared to 7% of those whose partner had not gambled in the past year.

In a recent sample of Australians, most reported that there were too many opportunities to gamble (77%) and that gambling should be discouraged (59%), while only 17% believed gambling is good for society (AGRC, 2023a, 2023b).

These financial losses, harms and public concerns underscore the need to treat gambling as a major public health issue requiring a coordinated response. Yet any policy seeking to reduce gambling harm must be grounded in accurate and up-to-date data, such as national prevalence estimates of gambling participation and harm (Migliavaca et al., 2020). The National Gambling Prevalence Study Pilot ('the Pilot') reported on here aimed to identify a rigorous, cost-effective and repeatable approach for conducting an ongoing national gambling prevalence study.

The current state of gambling prevalence studies

Australia does not currently have a routine national gambling prevalence study. Instead, gambling participation and harm are measured through a mix of state, territory and occasional national studies that vary in timing, geographic coverage, survey methodology, sampling approach, questionnaire content and the gambling activities examined. While these studies provide valuable insights into gambling within particular jurisdictions and populations, their differences limit the ability to produce a consistent national picture or track changes in gambling behaviour and harm over time.

This fragmented evidence base reflects Australia's regulatory environment, in which many land-based gambling activities are regulated by states and territories, while online wagering has a stronger national policy dimension. As a result, prevalence studies are often designed to meet jurisdiction-specific policy and funding priorities. Moreover, regular gamblers commonly participate in multiple forms of gambling across products regulated by different jurisdictions and administrative frameworks (Tillman et al., 2025a, 2025b). This contributes to significant variation in findings, with recent estimates of gambling participation ranging from 47% in Tasmania in 2021 to 86% in Western Australia in 2025 (Table 1).

The absence of a methodologically consistent national study means Australia lacks a reliable mechanism for monitoring trends in gambling participation and harm, evaluating policy reforms and comparing outcomes across jurisdictions and over time.

Obtaining prevalence estimates

Obtaining reliable prevalence estimates is challenging. Estimates are typically derived from cross-sectional surveys of a sample of the population. Because these surveys capture only a subset, rather than every individual, the estimates differ from the true population estimates (i.e. sampling error; ABS, 2023).

Sample estimates can also differ from the true population estimate due to non-sampling errors, such as when parts of the population do not receive the survey invitation (coverage error), choose not to participate (non-response bias) or are influenced by the way the questions are presented (measurement error).

Minimising these errors requires careful decisions about where to source respondents (the sampling frame), how to administer the questionnaire (the survey method) and even how the survey is advertised (e.g. the survey name). The choice of method often involves a trade-off between accuracy and study costs, due to finite budgets.

Sampling frames

Non-probability panels are the cheapest way to run surveys but rely on opt-in participation, making them vulnerable to bias and limited external validity if certain groups are more likely to either join or remain in the panel (Callegaro, Villar et al., 2014; Lugtig et al., 2014).

When accurate population estimates are needed, researchers should avoid non-probability samples because they are known to be biased, with lower accuracy demonstrated across topics such as voting behaviour, sexual behaviour, attitudes and socio-demographics in multiple countries including Australia (Baker et al., 2010; Cornesse et al., 2020).

More accurate, albeit more expensive sampling frames, include random digit dialling (RDD), address-based sampling (A-BS), and probability-based online panels. RDD draws samples from randomly generated telephone numbers within valid ranges for landline and mobile phones.

SMS invitations delivered via RDD can reach a broad, technologically engaged audience but may exclude people who are less comfortable with technology or lack mobile access. For example, the Australian Communications and Media Authority (ACMA, 2024) reported that Australians aged 75+ years were least likely to have used a messaging/calling app than all younger age groups and that women were more likely to have used an app for messaging and calls compared to males.

A-BS can achieve strong geographic coverage but is generally more expensive due to printing, postage and longer field times, and response rates vary by age, with older families and retirees more likely than younger cohorts to read mail directly addressed to them (Australia Post, 2015). In contrast to the RDD sampling method, A-BS sampling involves selecting a sample from a list of household addresses.

Declining RDD response rates have prompted exploration of new frames and methods, with some large-scale surveys moving from RDD to A-BS to improve coverage and enable web participation, although practical drawbacks, such as selecting individual apartment numbers from within apartment complexes, can complicate delivery (Pierannunzi et al., 2019). While A-BS offers advantages, cost efficiencies are not guaranteed, with some studies showing mixed results on whether A-BS is more cost-effective than RDD.

Probability-based online panels use random sampling methods like RDD and A-BS to invite individuals onto the panel (Callegaro, Baker et al., 2014). This approach provides more accurate and less biased prevalence estimates than opt-in panels. However, they require ongoing management to minimise attrition and maintain representativeness and, over time, non-response bias and panel conditioning can emerge.

Survey methods

The most common survey methods include computer-assisted personal interviewing (CAPI), computer-assisted telephone interviewing (CATI) and computer-assisted web interviewing (CAWI).

CAPI involves face-to-face interviews, CATI is administered by phone, and CAWI is self-administered online.

Researchers often avoid CAPI despite its advantages in data quality and response rates because it is the most resource-intensive survey method. Studies consistently show that CAPI requires significant investment in interviewer training, travel and equipment, making it impractical for most prevalence studies unless budgets are large or data quality requirements are exceptionally high (Baker, 1992; Smith & Kim, 2015).

Comparative research indicates that while CAPI offers superior control over data collection, CAWI and CATI are more affordable, faster and easier to scale, which explains their dominance in large-scale and time-sensitive projects (Broich et al., 2019; de Bruijne & Kalwij, 2024). Industry reports echo these findings, noting that CAPI is typically reserved for complex surveys where accuracy outweighs cost considerations (Elliott, 2021; GIIRAC, 2025). One such industry example is Roy Morgan, which announced the reintroduction of CAPI to complement their CATI and CAWI collections, stating that its inclusion is a requirement for achieving ‘truly representative research’ (Roy Morgan, 2024).

The Australian Comparative Study of Survey Methods compared 8 different ways of surveying Australian adults, using a mix of sampling frames and survey methods (Pennay et al., 2023). The study included CATI, CAWI and VALI (video-assisted live interviewing) but did not include CAPI. The most accurate results came from CATI surveys using RDD and from probability-based panels. CAWI surveys using RDD via text message invitations (i.e. SMS) were less accurate but still better than non-probability online panels, which were the least reliable and most variable, though, since 2015, their performance has improved over time.

Although CATI surveys are known to provide mostly accurate results, respondents are less likely to report sensitive information in CATI than in web-based surveys, suggesting that self-administered methods may reduce social desirability bias (Kreuter et al., 2008). Moreover, CATI faces growing challenges, including declining landline usage that has been falling from 54% in 2017 to 15% in 2024 (ACMA, 2024). More generally, there is increased reluctance to answer calls due to scam concerns, with 42% of Australians reporting they are less likely to answer phone calls for this reason (Beach, 2025).

Methodology effects on gambling measurements

Online self-completion surveys consistently produce higher estimates of gambling harm than in-person or interviewer-administered surveys, largely because they over-represent frequent and online gamblers (Sturgis, 2020; Sturgis & Kuha, 2021; Sturgis & Kuha, 2022). This over-representation is due to people who gamble online, frequently and are at higher risk of gambling harm self-selecting into online surveys (Heirene et al., 2025).

Explicitly mentioning gambling in a survey invitation may not affect overall response rates but may increase reported gambling participation. Sturgis and colleagues reported that including gambling in a survey invitation resulted in an approximate 4 percentage points increase in individuals who reported gambling participation, suggesting that people with a personal interest in gambling were more likely to respond (Sturgis et al., 2025).

PGSI scores from CAWI surveys are 4.4 percentage points higher than CATI, indicating that respondents may under-report undesirable behaviours in interviewer-administered surveys due to social desirability bias (Sturgis et al., 2025).

Survey invitations, and how a survey is described (its name or topic), can also influence who takes part and what they report. For example, surveys labelled as ‘gambling’ attract more gamblers and report higher rates of gambling harm (Sturgis et al., 2025; Williams & Volberg, 2009).

Mixed-mode surveys

Mixed-mode surveys that combine web, mail, telephone and, sometimes, face-to-face survey methods and RDD and A-BS sampling frames are now widely recommended as best practice for large-scale and official statistics surveys because they improve inclusivity, coverage and cost-effectiveness while maintaining data quality (Ashford et al., 2022; Coffey et al., 2024; Olson et al., 2021; Stadtmüller et al., 2021).

Online surveys with a postal fallback, as used in the Gambling Survey for Great Britain, is a practical example of a representative and cost-efficient gambling prevalence survey. While mixed-mode surveys require careful harmonisation to manage method effects, they are increasingly standard for general population studies. The usefulness of mixed-mode surveys needs to be further explored for gambling prevalence studies in an Australian context.

Why a national pilot study was needed

As noted previously, Australia lacks a reliable mechanism for monitoring trends in gambling participation and harm, evaluating policy reforms and comparing outcomes across jurisdictions and over time.

A further practical challenge is cost. Traditional probability-based survey methods, particularly telephone and face-to-face approaches, can provide robust estimates but are increasingly expensive and difficult to sustain. Lower-cost online approaches can improve feasibility but may introduce selection and measurement biases.

The need for stronger national data was highlighted by the parliamentary inquiry into online gambling, which recommended ongoing funding for gambling research, including prevalence studies on online gambling harm. This recommendation reflected the growing policy importance of timely and comparable data in a gambling environment shaped by online wagering, advertising, consumer protection reforms and changing patterns of harm.

The National Gambling Prevalence Study Pilot represents the first attempt to establish a nationally representative gambling prevalence study in Australia. It was designed to test:

- the feasibility of generating consistent national data on gambling participation and harm, addressing a longstanding gap in Australia’s gambling evidence base
- whether a mixed-mode approach could balance cost, coverage, representativeness and accuracy
- survey design features needed to support a future ongoing national gambling prevalence study.

Table 1: Recent Australian gambling prevalence studies by jurisdiction

Jurisdiction	Most recent prevalence study	Year	Any gambling in the past 12-months prevalence
National	Interactive Gambling Study	2019	56.9%
NSW	NSW Gambling Survey	2024	53.5%
Victoria	Victorian Population Gambling and Health Study	2023	53.5%
Queensland	Queensland Gambling Survey	2023	69.8%
South Australia	Gambling Prevalence in South Australia	2018	65.0%
Western Australia	Research into gambling prevalence and gambling harm in WA	2025	86.0%
Tasmania	Fifth Social and Economic Impact Study of Gambling in Tasmania	2021	47.0%
ACT	ACT Gambling Survey	2024	53.2%
Northern Territory	NT Gambling Prevalence and Wellbeing Survey	2023	73.4%

Methodology

The study sample comprised 3,881 adults aged 18 years or older and residing in Australia during August–October 2024. Only one respondent per household was eligible. Respondents received a $20 e-gift voucher or charity donation option on survey completion.

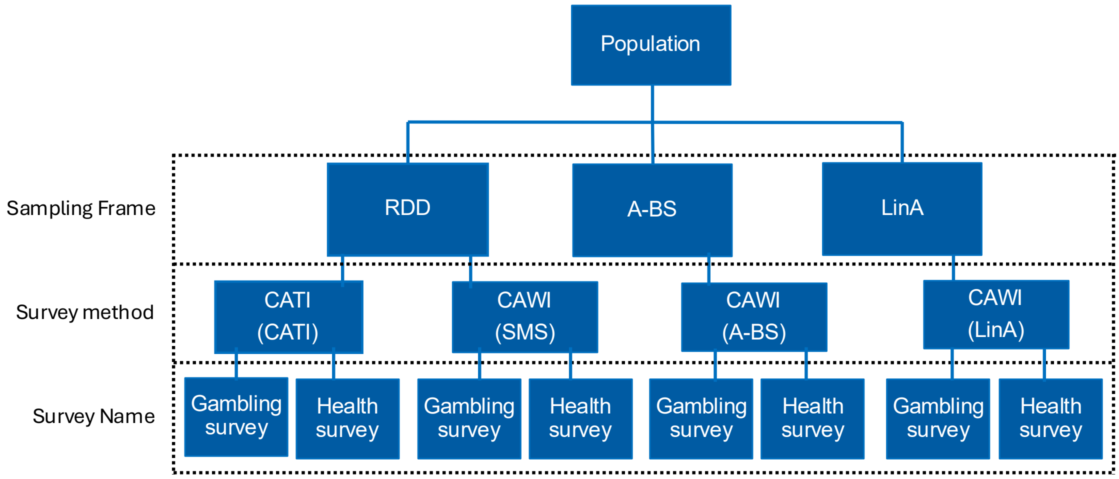
All research procedures were conducted in accordance with ISO 20252:2019, the Research Society Code of Professional Behaviour, the Australian Privacy Principles and the Privacy (Market and Social Research) Code 2021. Ethics approval was granted by the AIFS Human Research Ethics Committee (Project 2024/01).

Procedure and design

The study was a partially crossed 3 (sampling frames) × 2 (survey methods) × 2 (survey names) factorial design. The sampling frames consisted of random digit dialling (RDD) to mobile numbers, address-based sampling (A-BS) via postal invitations and recruitment from the Life in Australia™ (LinA) probability-based online panel. The survey methods consisted of computer-assisted telephone interviewing (CATI) and online self-completion. The survey names consisted of a gambling-framed (Australian Gambling Survey) or health-framed (Australian Public Health and Leisure Survey) invitation. All respondents were randomised to receive 1 of the 2 survey names.

Not all combinations of sampling frame and survey method were implemented (e.g. CATI was only used for RDD) so the data were collapsed to a 4 (survey mode: CATI, SMS, A-BS, LinA) × 2 (survey name: gambling vs health) design for analysis purposes. This approach reflects the actual recruitment pathways of respondents and accounts for cells in the full factorial structure with no data. The recruitment pathways are visualised in Figure 1.

Figure 1: Recruitment pathways via sampling frame, survey method, and survey name



Notes: The labels in brackets (e.g. CATI, SMS, A-BS, LinA) denote the survey modes used for analysis after collapsing the original design. RDD included both CATI and CAWI (via SMS invitations), while A-BS and LinA used CAWI only.

Recruitment and data collection procedures were tailored to each sampling frame. RDD cases received an advance SMS and were randomised to CATI or online completion and then to a survey naming condition. A-BS invitees were directed to the online survey via QR code and postcode verification, ensuring access was restricted to sampled addresses. Panel members were invited via secure email links. Fieldwork was conducted across defined windows: CATI (21 August–13 October), A-BS online (21 August–11 October) and panel/SMS online (16–29 September).

Mobile RDD numbers were randomly drawn from ACMA allocations and screened to remove inactive lines, resulting in an estimated national coverage of approximately 97%. Integrated Public Number Database (IPND) based sampling was not used due to application and approval constraints associated with project timelines.

Materials

The sequence of topics in the questionnaire used in the current study are presented in Figure 2. Homogenous wording was used across CATI and online instruments to ensure comparability. The survey was programmed and tested in-house by the AGRC and the Social Research Centre (SRC), with operational testing procedures applied to both CATI and online versions prior to fieldwork. The survey questionnaire used the Problem Gambling Severity Index (PGSI) as the measure of at-risk gambling behaviour.

Problem Gambling Severity Index (PGSI)

The Problem Gambling Severity Index (PGSI) can be used to measure gambling-related harm. The PGSI provides a validated measure of at-risk gambling behaviour during the previous 12-month period.

It consists of 9 items (questions), such as ‘Have you bet more than you could really afford to lose?’, with response options being never (0), sometimes (1), most of the time (2) and almost always (3).

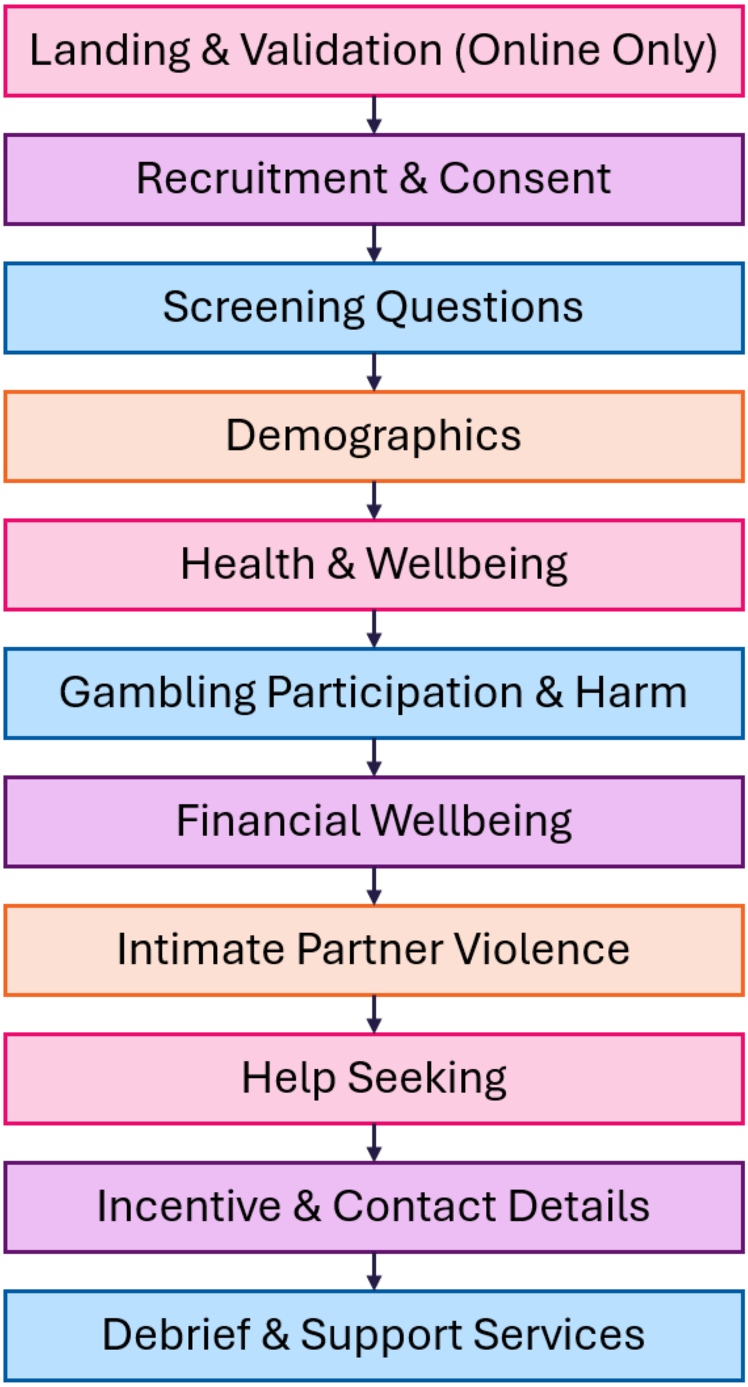
Scores are summed for a total between 0 and 27.

Respondents are grouped into 4 categories based on their scores: non-risk (‘non-problem’) gambling (0), low-risk gambling (1–2), moderate-risk gambling (3–7) and high-risk (‘problem’) gambling (8–27).

Respondents scoring 1+ may be classified as ‘at-risk’ of, or already experiencing, gambling-related harm. In this report, we use the term ‘high-risk gambling’ instead of ‘problem gambling’. This is done to de-stigmatise people who are experiencing gambling harms, as the use of the term ‘high-risk’ is less stigmatising than the use of ‘problem’. Further, the term ‘high-risk gambling’ focuses on a public health approach, moving away from a clinical definition.

Source: Ferris & Wynne, 2001

Figure 2: Questionnaire topic sequence



Field methods

Fieldwork was conducted by the SRC, with procedures tailored to each survey method. CATI interviewers received standardised training and attended a 2-hour briefing session covering survey context, sample management, respondent liaison and questionnaire review. Interviewers participated in practice interviews and quality monitoring included validation of 5% of telephone surveys and field team debriefings.

The SMS arm used pre-notification SMS, invitation and reminder cycles and a $20 e-gift voucher incentive. A-BS invitations were mailed with QR codes and reminders, and fieldwork was monitored daily. All A-BS invitations were delivered by post, and all responses were collected online via unique QR code and postcode validation. No telephone or in-person follow-up was conducted for A-BS. Panel members received standard LinA communications and incentives, with quality checks including logic checks and review of verbatim responses in the free-text fields.

Data quality safeguards included checks for mono-answering, inconsistency and rapid completion as well as the review of open-ended responses. A total of 3,885 survey responses were received prior to the closing date, with 4 excluded after quality checks, resulting in a final sample of 3,881. Case attrition and completion numbers are presented in Figure 3.

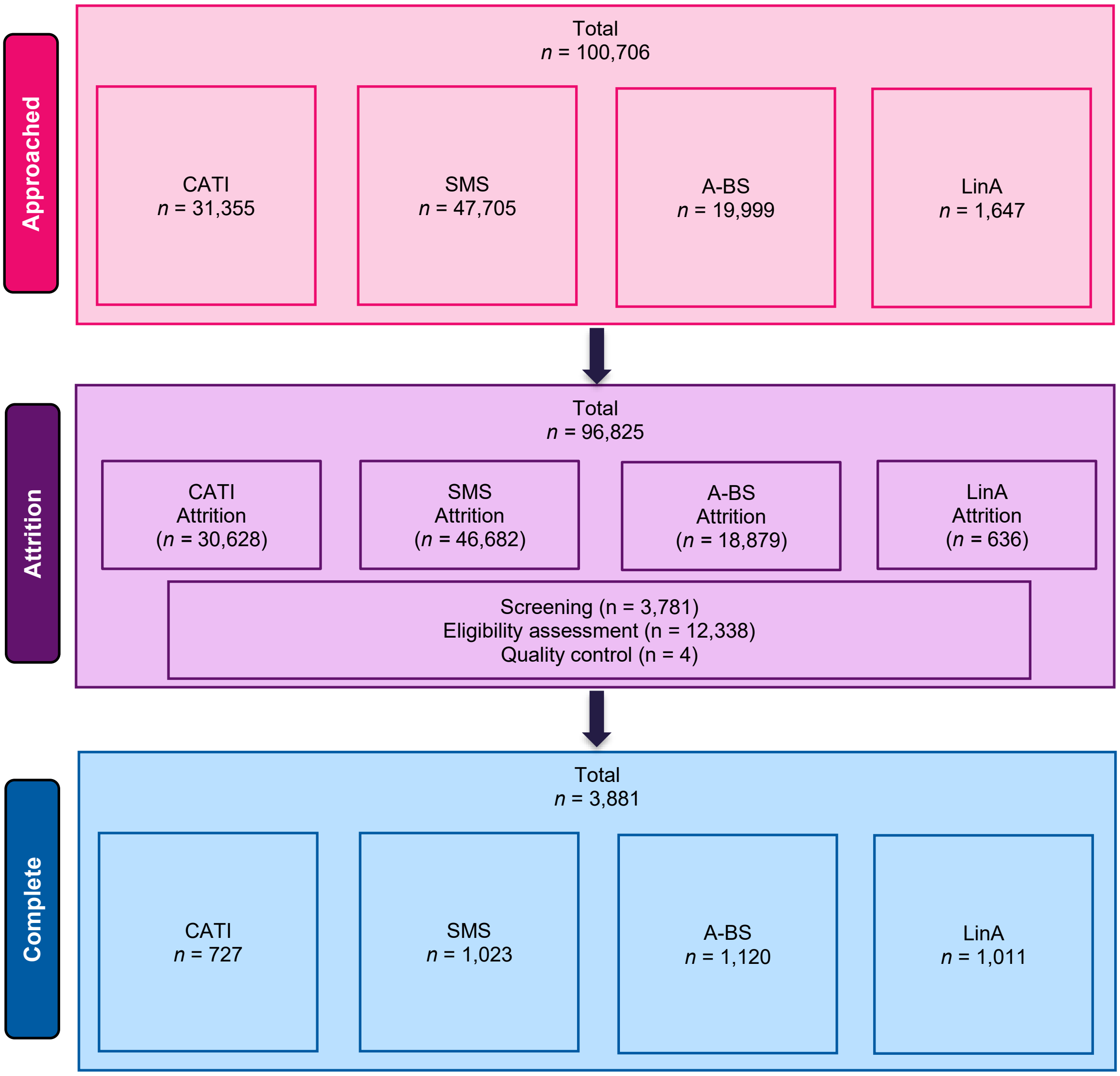
Response rates were calculated using the American Association for Public Opinion Research (AAPOR) Standard Definitions (American Association for Public Opinion Research, 2023). CATI and SMS arms achieved response rates of 2.9% and 2.2%, respectively. A-BS achieved 10.5% and the LinA panel achieved a completion rate of 61.6%. The cumulative response rate for the LinA panel, accounting for recruitment and retention, was 2.4%.

Data preparation

Survey data underwent rigorous processing and cleaning, including back-coding of open-ended responses and validation according to ISO 20252 standards. Weights were applied in 2 stages to ensure the sample was representative of the Australian adult population in Q2 2023. Base weights were calculated as the inverse of each respondent’s selection probability and adjusted by the response rate. For survey methods in which individuals were the sampling unit, weights were based on the ratio of population to respondents in each city area. For survey methods in which households were the sampling unit, weights were based on the ratio of households to respondents in each city area.

Base weights were adjusted using generalised regressions (GREG) to align weighted estimates for each survey method (CATI, SMS, A-BS and LinA) with population values for key demographic characteristics. Analyses below are conducted on the individual weighted datasets of CATI, SMS, A-BS and LinA.

Figure 3: Case attrition and completion numbers by survey method



Survey method and name effects

Participation, online use and harm

Key insight

The 'gambling' survey invitations were more likely to attract people with higher gambling involvement and gambling-related risk compared to 'health' survey invitations. Online survey modes were more likely to include people who gamble online compared to CATI survey modes. In addition, interviewer presence in CATI may have contributed to lower reporting of harm, consistent with previous evidence on social desirability bias.

Three separate probit regression models were estimated to predict either gambling participation (Have you gambled in the past 12 months?), gambling online (Have you gambled online in the past 12 months?) or gambling harm (PGSI score > 0). The probit models estimated the probability of membership in the 'Yes' category. For gambling harm, the 0 = no category represented those who gamble with no risk or experience of gambling harm and those who did not gamble in the past 12 months.

All models included 2 sets of predictors, the treatment variables (i.e. survey method and survey name) and the demographic control variables that included age, gender, employment status, state of residence, Aboriginal and Torres Strait Islander status, country of birth, relationship status, living arrangement (living alone), university education, alcohol use and area-level socio-economic disadvantage. The analysis determined if the predicted prevalence of the gambling outcome variables varied across survey method or survey name while controlling for key demographics.

All probit regression models were specified as follows:

$$\Phi^{-1}\big(P(\boldsymbol{Y}=1)\big)=\alpha+\boldsymbol{T\beta_1}+\boldsymbol{C\beta_2}$$

Where:

- Φ^{-1} is the inverse standard normal cumulative distribution function
- $\boldsymbol{Y}$ is a vector of observed binary outcomes (1 = yes, 0 = no)
- α is the model intercept
- $\boldsymbol{T}$ is the design matrix for treatment variables
- $\boldsymbol{C}$ is the design matrix for demographic control variables
- $\boldsymbol{\beta_1}$ is a vector of treatment coefficient parameters
- $\boldsymbol{\beta_2}$ is a vector of demographic control coefficient parameters.

The models were estimated on weighted data to allow for population representative inference and design-corrected standard errors. Although some demographic variables were included in the weighting adjustment, they were also entered as covariates in the probit models to better isolate the effects of survey method and survey name on gambling-related outcomes.

Survey method was a categorical variable with 4 levels. Computer-assisted telephone interviewing (CATI), SMS push to web (SMS), address-based sampling push to web (A-BS) and Life in Australia™ panel (LinA). Survey name was a binary categorical variable with the levels gambling survey and health survey.

Test statistics, *p* values, average marginal effects and their 95% confidence intervals are presented for each analysis. Inference was based on a long-run Type I error tolerance of 5%, where *p* values less than .05 represent a statistically significant effect. The probit regression models were estimated in Stata (version 19) (StataCorp, 2025).

The overall probit regression model predicting gambling participation prevalence was statistically significant based on a design-adjusted Wald test, $F(27, 3{,}658) = 7.14$, $p < .001$. In the model there was a significant effect of survey name, $t(3684) = 2.46$, $p = .02$. Respondents in the gambling survey condition had a higher predicted gambling participation prevalence than those in the health survey condition, with an average marginal effect of 4.34 percentage points (95% CI [0.90, 7.79]). Pairwise comparisons indicated that A-BS had a significantly higher predicted gambling participation prevalence than CATI (7.87 percentage points, 95% CI [2.68, 13.06]), $t(3684) = 2.97$, $p = .01$) and LinA (4.70 percentage points, 95% CI [1.20, 9.28]), $t(3{,}684) = 2.01$, $p = .04$). No other survey method contrasts were statistically significant.

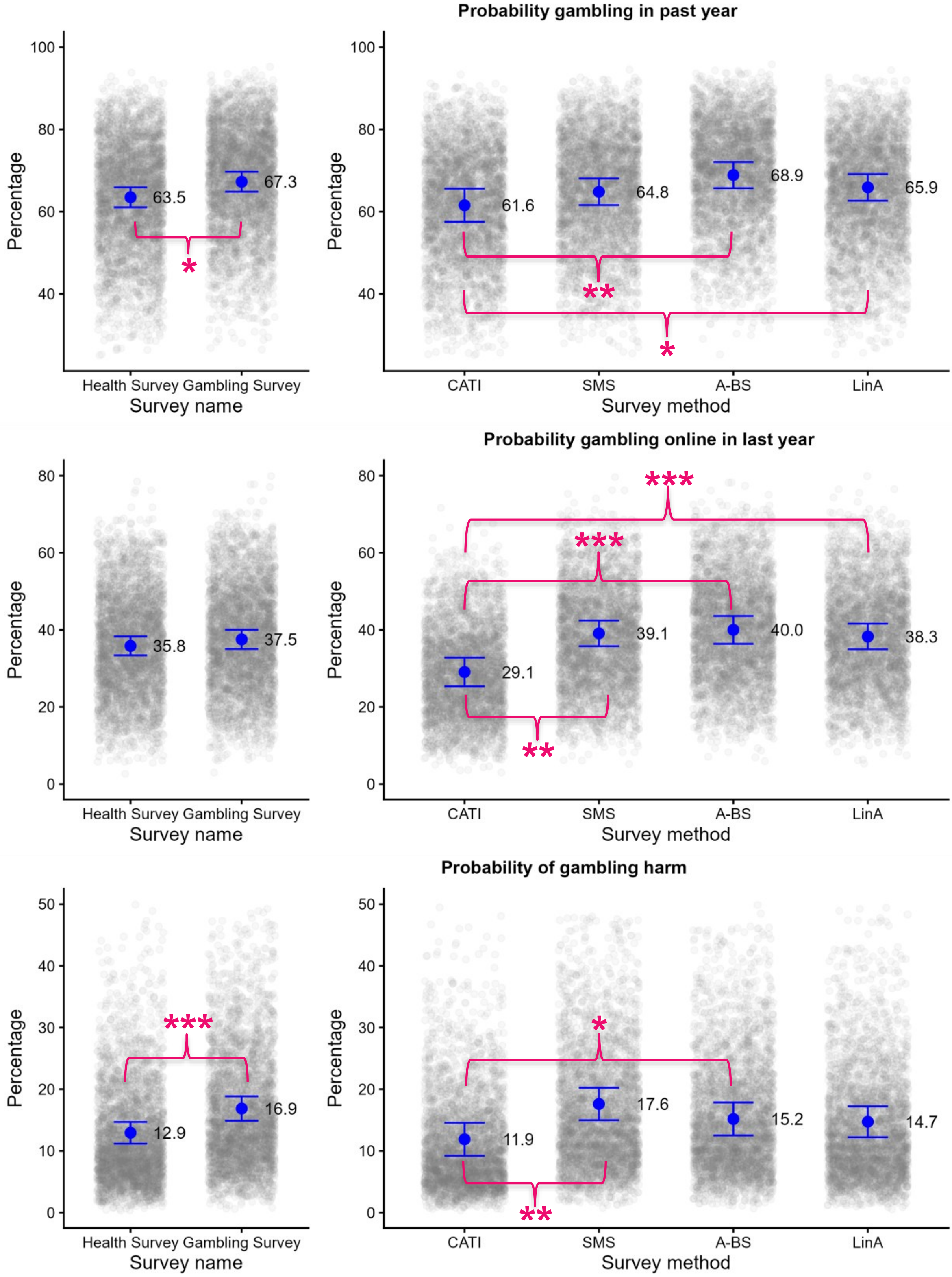
The overall probit regression model predicting gambling online prevalence was significant, $F(27, 3{,}661) = 7.11$, $p < .001$. In the model there was no significant effect of survey name, $t(3{,}687) = 0.98$, $p = .33$. Pairwise comparisons indicated that predicted online gambling prevalence was significantly lower for CATI compared to SMS (8.82 percentage points, 95% CI [3.72, 13.92]), $t(3{,}687) = 3.39$, $p < .001$), A-BS (11.20 percentage points, 95% CI [5.96, 16.44]), $t(3{,}687) = 4.19$, $p < .001$) and LinA

(9.12 percentage points, 95% CI [4.04, 14.19]), $t(3,687) = 3.52$, $p < .001$). No other survey method contrasts were statistically significant.

The probit regression model predicting gambling harm prevalence was significant, $F(27, 3,661) = 5.98$, $p < .001$. In the model there was a significant effect of survey name, $t(3,687) = 3.18$, $p < .001$. Respondents in the gambling survey condition had a higher predicted gambling harm prevalence than those in the health survey condition, with an average marginal effect of 4.35 percentage points (95% CI [1.67, 7.02]). Pairwise comparisons indicated that predicted gambling harm prevalence was significantly lower for CATI than for SMS (5.53 percentage points, 95% CI [1.73, 9.32]), $t(3,687) = 2.85$, $p = .01$) and A-BS (4.58 percentage points, 95% CI [0.69, 8.47]), $t(3,687) = 2.31$, $p = .02$). No other survey method contrasts were statistically significant.

The predicted prevalence rates from each of the models for participation, online use and harm across survey method and survey name are presented in Figure 4. Overall, how people were recruited and the name of the survey they completed influenced the measurement of gambling-related outcomes. People who took part in the gambling-focused survey were more likely to report gambling and gambling harm compared to those in the health survey. Online survey modes (such as A-BS and SMS) tended to show higher rates of gambling participation and online gambling compared to phone interviews (CATI). For gambling harm, SMS and A-BS also showed higher prevalence than CATI.

Figure 4: Participation, online use and harm across survey name and survey method



Notes: Light grey points are individual fitted values from the model (jittered vertically and horizontally for visibility). Blue dots are the mean of the fitted probabilities. Error bars represent 95% confidence intervals. **p* < .05, ***p* < .01, ****p* < .001.

Attributing gambling harm to gambling form

Key insight

Electronic gaming machine (EGM) participation accounted for the largest share of gambling harm, followed by any wagering. Poker, keno, scratch tickets, casino table games and bingo ranked next but added relatively smaller contributions. Lottery had negligible (nearly zero) contributions to harm. Effect sizes of harm attribution varied by survey mode but the overall harm ranking remained consistent.

In this analysis, we estimated the relative influence of each form of gambling on the risk and experience of gambling-related harm (i.e. PGSI score) and explored how this estimate varied across survey mode. Many gamblers participate in several activities, which can create overlapping effects that need to be disentangled to effectively assess gambling harm. This disentangling can be done by combining multiple regression and Lindeman–Merenda–Gold (LMG) analysis (Lindeman et al., 1980). LMG analysis partitions the explained variance of a multiple regression model fit so that we can quantify, for example, the variance in gambling harm attributable to variance in EGM participation. Repeating the analysis for each weighted dataset (i.e. CATI, SMS, A-BS and LinA) allowed us to explore how the gambling harm attributed to a specific gambling form depended on the survey method used.

We fit multiple regression models that predicted log-transformed PGSI scores from the participation frequency of electronic gaming machines (EGMs), casino table games, poker, keno, lotteries, instant scratch tickets, bingo and any wagering. Any wagering was made up of sports wagering, horse race wagering, esports wagering, virtual sports wagering and novelty wagering.

Participation frequency was based on the ordinal response categories from the survey, where 0 = not in the past 12 months, 1 = once or twice a year, 2 = a few times a year, 3 = once a month, 4 = 2 to 3 times a month, and 5 = once a week or more often. While useful for ranking participation, these categories do not capture absolute frequency or variability within categories (e.g. differences between weekly and daily play). Moreover, this measure of gambling participation does not capture intensity and expenditure patterns that may substantially influence relative contributions to the harm observed here.

A log transformation was applied to reduce skewness in PGSI scores, and survey weights were applied to ensure estimates reflected population-level patterns rather than sample-specific distributions. The sample was restricted to those who answered the PGSI questionnaire.[2]

The multiple regression models were specified as follows:

$$\log(PGSI + 1) = \alpha + \boldsymbol{X\beta} + \boldsymbol{\varepsilon}$$

Where:

- $\log(PGSI + 1)$ is the log-transformed Problem Gambling Severity Index score (with 1 added to handle zero values)
- α is the model intercept
- $\boldsymbol{X}$ is the design matrix of gambling frequency variables for each form type
- $\boldsymbol{\beta}$ is the vector of regression coefficients corresponding to the gambling frequency variables

2 This approach excludes non-gamblers from the analysis. Including non-gamblers means a PGSI score of zero captures both non-risk gambling among active gamblers as well as non-gamblers. Excluding non-gamblers removes the need to fit a joint model that simultaneously models non-gamblers vs non-risk gamblers (e.g. logistic regression) and model PGSI scores (e.g. negative binomial model), in other words a zero-inflated negative binomial model. While such models have been used in gambling research with PGSI scores in the past, they were avoided here for the purpose of LMG analysis.

- $\boldsymbol{\varepsilon}$ is the vector of residual error terms that we assumed followed a normal distribution.

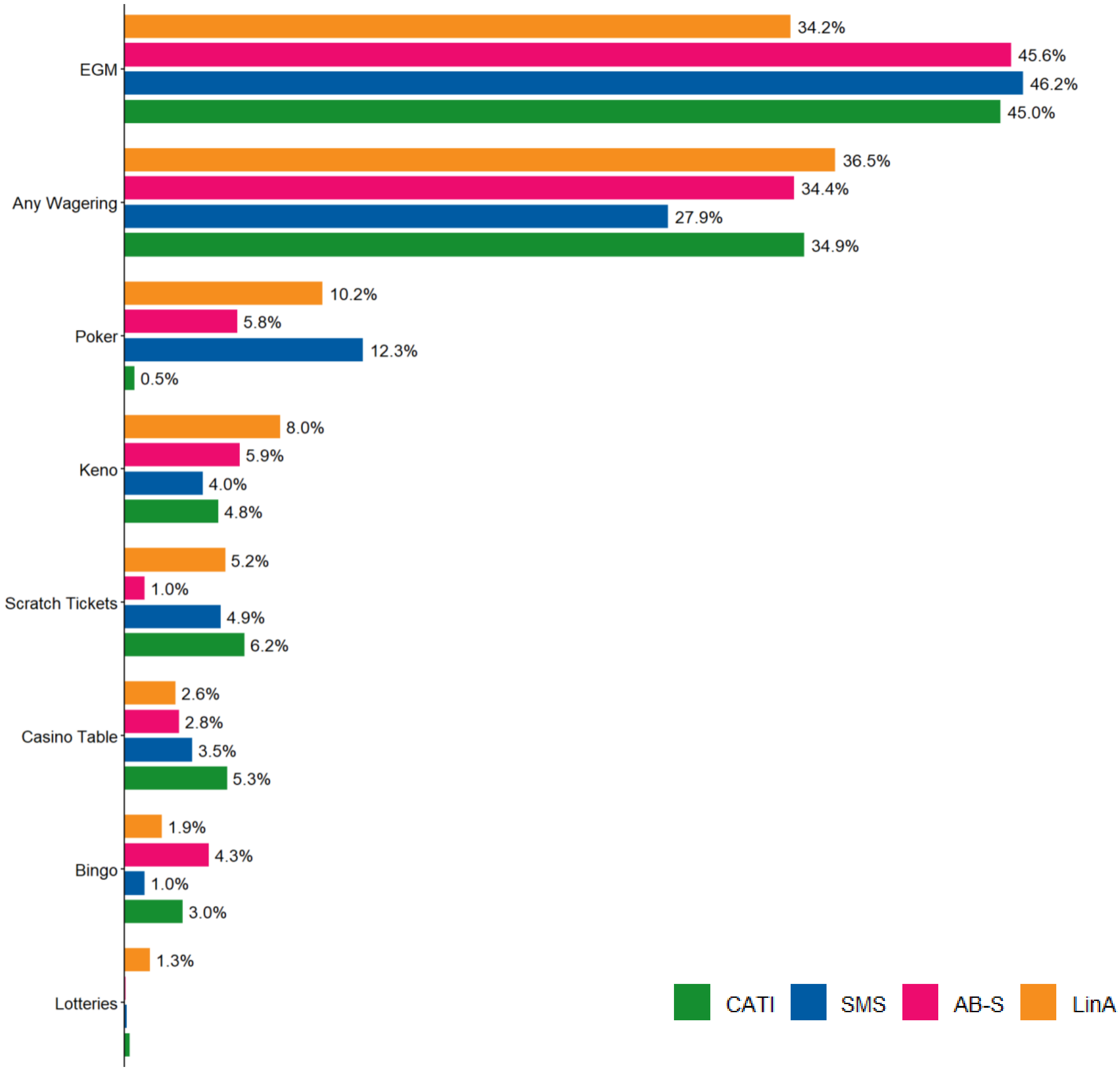
After this model was fitted to each of the separate weighted datasets[3], multicollinearity was assessed using VIF to confirm that predictors were not excessively correlated, given they are all gambling related. Then LMG analysis was conducted in R (version 4.5.1) using the *relaimpo* package. Relative importance, or contribution to gambling harm, is represented by R^2 (i.e. the proportion of variation in PGSI that is explained by the model), which increases when a predictor is added to the model for each possible combination of predictors. These contributions were then averaged over all permutations, giving a fair estimate of how much variance each predictor explained of the total variance. The LMG metric has been previously applied in gambling research and was adopted here for consistency and comparability (Browne et al., 2023).

The relative importance of each gambling form across 4 weighting schemes (CATI, SMS, A-BS and LinA) is presented in Figure 5. Electronic gaming machines (EGMs) consistently accounted for the largest share of explained variance (34.2%–46.2%), followed by wagering activities (27.9%–36.5%). Poker contributed moderately (5.8%–12.3%), while Keno explained 4.0%–8.0%. Instant scratch tickets and casino table games showed smaller but variable contributions (1.0%–6.2% and 2.6%–5.3%, respectively) and Bingo remained low (1.0%–4.3%). Lotteries exhibited negligible or near-zero relative importance across all schemes.

Overall, EGMs and wagering activities emerged as the largest contributors to explained variance in gambling harm. Despite a consensus in the LMG analysis results overall, EGMs have the highest importance under SMS weighting (46.2%) but drop substantially under LinA (34.2%), while wagering activities were the highest under LinA (36.5%) and lowest under SMS (27.9%).

[3] The R^2 values used in the LMG analysis were calculated from models fitted to weighted data. They should therefore be interpreted as weighted, model-based measures of explained variation in PGSI scores, rather than as conventional R^2 values.

Figure 5: Relative importance of different gambling activities by survey method



Note: Activities are ranked top to bottom in order of contribution to explained variance in PGSI scores.

Survey method cost and accuracy

Cost per sample

Key insight

The cost per complete for the online panel (LinA) was only 14% of CATI, SMS was 20% and A-BS was 28%.

To evaluate cost-effectiveness, costs per complete (CPC) were compared across the 4 survey modes. As to not disclose the exact pricing information, CATI was used as a reference point for all relative cost comparisons.

Relative to CATI (set as 1.00), other survey modes demonstrate substantially lower CPC. LinA is the most cost-effective, with a CPC ratio of 0.14, followed by SMS (0.20) and A-BS (0.28).

For CATI, programming and data collection accounted for 81.8% of costs, reflecting interviewer labour. For SMS, approach and reminder costs dominated (43.9%), followed by incentives (35.7%). For A-BS, mailing costs comprised 69.3% of expenditure. For LinA, incentives represented 50.4% of costs and programming and data collection represented 37%.

The CATI mode substantially inflates average survey duration compared to other survey modes. While most modes ranged between 16.0 and 17.5 minutes per interview, CATI averaged 28.2 minutes, nearly 70% longer than the next highest mode.

While calculating the cost per sample provides an easy metric for cost-efficiency of different survey modes, it does not incorporate the quality of the sample yielded. One way to incorporate sample quality is to calculate the cost per effective sample.

The effective sample size is the observed sample size divided by the design effect (Kish, 1995). The design effect is a measure of how much the variance of the sample has increased due to the weighting procedure.

On average, the weighting procedure inflated the variance of LinA by 19%, CATI by 39%, SMS by 65% and A-BS by 71%. Again, using CATI as a baseline, LinA is the most cost-effective, with a cost per effective sample ratio of 0.12, followed by SMS 0.24 and A-BS 0.34.

Survey mode bias

Key insight

SMS showed the highest average absolute bias, followed by A-BS, then CATI. LinA had the lowest average absolute bias. A ‘gambling’ survey name slightly reduces bias versus a ‘health’ label.

Each of the survey modes were over-representative of individuals born in Australia (i.e. an under-representation of individuals born outside Australia). This over-representation was highest in the SMS push to web (12.24 percentage points). All survey modes apart from CATI had an over-representation of respondents residing in capital cities. Male respondents were over-represented in the online panel (0.79 percentage points) and the CATI survey method (4.43 percentage points). However, males were under-represented through A-BS (2.97 percentage points) and the SMS push to web (7.98 percentage points). All survey modes showed an over-representation of people living in one adult households with this over-representation being highest in the A-BS method (10.27 percentage points).

Males were over-represented in the gambling survey condition (1.1 percentage points) and under-represented in the health survey condition (-3.8 percentage points). Further, those in the gambling survey were additionally over-representative of those living in capital cities (3.1 percentage points), while those in the health survey closely represented both those living in capital cities and outside of capital cities (0.1 percentage points).

Both those in the health and gambling survey were over-representative of those born in Australia (8.0 and 7.4 percentage points respectively) and were also over-representative of single adult households, with those in the health survey being even more over-represented than in the gambling survey (4.2 vs. 2.8 percentage points).

For both the health and gambling surveys, respondents who had less than a bachelor’s degree qualification were equally likely to be under-represented, with the magnitude of this under-representation increasing with the age group. For example, those aged 35–44 without a bachelor’s degree were under-represented by 2.6 and 2.9 percentage points in the health and gambling survey respectively, while this under-representation grew to 5.3 and 4.1 percentage points respectively for those aged 65 and over without a bachelor's degree.

To compare the extent of bias introduced by each survey mode and survey name we calculated average absolute bias (AAB) values. AAB quantifies the absolute difference between sample estimates and population benchmarks for each characteristic or outcome of interest, with lower values indicating closer alignment between the sample and the population (see Phillips et al., 2023). The AAB is calculated as:

$$AAB = \frac{1}{p}\sum_{k=1}^{p} B_k$$

where:

- p is the number of variables included in the bias assessment
- B_k is the average absolute bias (AAB) for the kth variable, defined as:

$$B_k = \frac{1}{c_k}\sum_{j=1}^{c_k} \mid E(x_{jk}) - \hat{x}_{jk} \mid$$

where:

- $c_k$is the number of categories for variable k
- $E(x_{jk})$ denotes the benchmark (population) value for the jth category of the kth variable
- $\hat{x}_{jk}$ denotes the sample estimate for the jth category of the kth variable.

The AAB for each of the survey modes and survey names is shown in Table 2. The LinA panel showed the lowest difference between the unweighted data and the population benchmarks (2.29 percentage points), followed by CATI (3.11 percentage points), then A-BS (3.69 percentage points) and SMS (5.21 percentage points).

One puzzling finding is that SMS has slightly lower inflation of variance due to weighting compared to A-BS but performs substantially worse on AAB compared to the A-BS survey mode. This may be because A-BS has larger biases in the age × education cells, which are sparse in data. Sparse data require large weights for adjustment and therefore increase the variability in the weights. Nonetheless, the AAB measure shows that the unweighted A-BS sample is closer to population benchmarks overall than the SMS.

Table 2: Average absolute bias by survey mode and survey name

Average absolute bias	CATI	SMS	A-BS	LinA	Health survey	Gambling survey
Number of household adults	2.22	2.92	5.33	3.95	4.22	2.85
Age group by highest qualification	3.17	3.86	5.28	0.75	2.70	2.91
Sex	4.43	7.98	2.97	0.79	3.83	1.11
State	1.28	0.79	0.49	1.26	0.84	0.69
Part of state	1.01	3.49	2.12	0.96	0.10	3.09
Country of birth	6.56	12.24	5.96	6.02	8.02	7.42
Overall	**3.11**	**5.21**	**3.69**	**2.29**	**3.29**	**3.01**

Mixed-mode surveys

Key insight

Mixed-mode reduced overall bias in demographic representativeness and lowered costs relative to a CATI only survey mode. A blend of 60% CATI, 29% SMS, and 11% A-BS achieved the lowest average absolute bias at 67% the cost of CATI. The best value for money was a blend of 40% CATI and 60% A-BS at a cost of 57% of CATI. The improvements of mixing SMS and A-BS survey modes into CATI were driven primarily by improvements in sex and state representation.

Mixed-mode survey designs have numerous advantages (Ashford et al., 2022; Coffey et al., 2024; Olson et al., 2021; Stadtmüller et al., 2021). Therefore, considering the optimal combination of modes rather than evaluating a single mode helps achieve the best balance of cost and representativeness.

While LinA demonstrates strong performance in terms of both cost and AAB, it is excluded from the following mixed-mode analysis due to its proprietary nature, fixed panel size and limited accessibility, which restrict the generalisability of findings. By focusing on more widely available survey modes, this analysis provides insights that are broadly applicable and sustainable for future large-scale studies.

To evaluate mixed-mode, we simulated a range of hypothetical survey mode blends by proportionally weighting the observed summary statistics for each benchmark variable according to each mode's contribution to the total sample. For each survey mode m (e.g. CATI, SMS, A-BS), we calculated the proportion of respondents in each demographic or benchmark cell j, denoted as μ_{mj}, and compared these to the corresponding population benchmarks μ_{Pj}. For any hypothetical blend, weights w_m were assigned to each mode such that $\sum_m w_m = 1$, and the blended proportion for cell j was calculated as:

$$\mu_{\text{blend},j} = \sum_m w_m \mu_{mj}$$

The AAB for each blend was then calculated using the same approach as for individual modes. For example, with the weights $w_{\text{CATI}} = 0.6$, $w_{\text{SMS}} = 0.3$, and $w_{\text{A-BS}} = 0.1$, and observed proportions for a benchmark cell of $\mu_{\text{CATI},j} = 12\%$, $\mu_{\text{SMS},j} = 10\%$, $\mu_{\text{A-BS},j} = 14\%$, the blended proportion is:

$$\mu_{\text{blend},j} = (0.6 \times 12) + (0.3 \times 10) + (0.1 \times 14) = 11.6\%$$

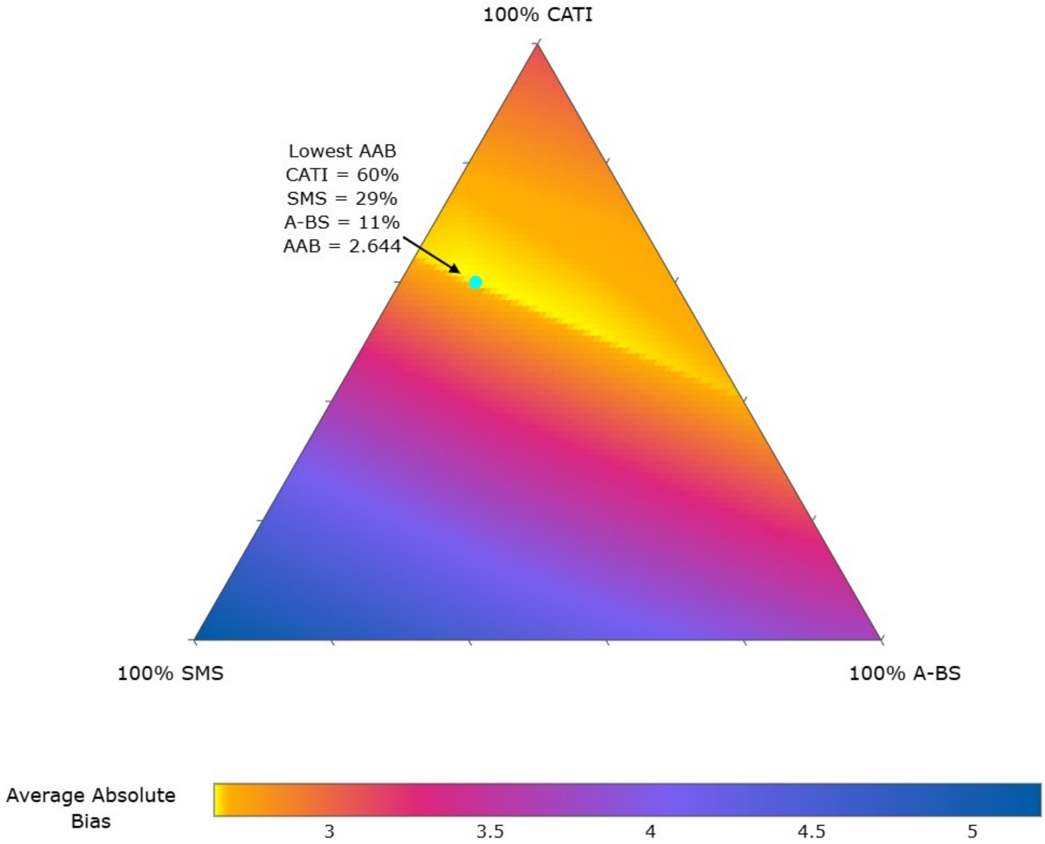
Therefore, in this scenario when compared to a population benchmark of $\mu_{Pj} = 13\%$, the mixed-mode blend underestimates by 1.4%. This process was repeated for all cells, then aggregated by group and averaged to yield the AAB for each blend. By systematically adjusting the weights w_m, we could map the trade-off between bias across survey modes.

These results are visualised in Figure 6 using a ternary plot, where each corner represents a pure survey mode (100% CATI, 100% SMS or 100% A-BS). The interior of the triangle reflects simulated blends of these modes, generated by combining the distributions of summary statistics for each method. The centre of the triangle corresponds to an equal allocation of completes across all 3 modes.

While CATI alone produces the lowest bias among single-mode options, blending CATI with other methods further reduces bias. The optimal combination for minimising AAB is 60% CATI, 29% SMS and 11% A-BS, achieving an AAB of 2.64 compared to 3.11 for CATI alone.

However, introducing a third mode offers only marginal gains beyond certain two-mode blends. For example, excluding SMS, a mix of 41% CATI and 59% A-BS yields an AAB of 2.68, nearly equivalent to the three-mode minimum. Similarly, if A-BS is excluded, a CATI/SMS blend (65% CATI, 35% SMS) achieves an AAB of 2.66. Notably, no SMS/A-BS combination outperforms A-BS alone, underscoring CATI's critical role in bias reduction.

Figure 6: AAB across CATI, A-BS and SMS blends



Notes: Each corner of the triangle represents a pure mode (100% CATI, 100% SMS or 100% A-BS). Points within the triangle correspond to proportional mixes of these modes, with the centre indicating an equal allocation (33% each). Colour shading reflects AAB values, where yellow indicates lower bias and blue indicates higher bias. The highlighted point marks the blend with the lowest AAB (CATI = 60%, SMS = 29%, A-BS = 11%, AAB = 2.644).

Cost considerations add another dimension to this analysis. The expected CPC for each blend was calculated as the weighted sum of the mode-specific costs:

$$C_{\text{blend}} = \sum_{m} w_m c_m$$

Figure 7 displays the best achievable AAB on the y-axis for any given maximum spend relative to CATI on the x-axis. The relationship between AAB and cost presents 2 ‘elbows’ where there is a substantial change in the relationship between spending and bias reduction.

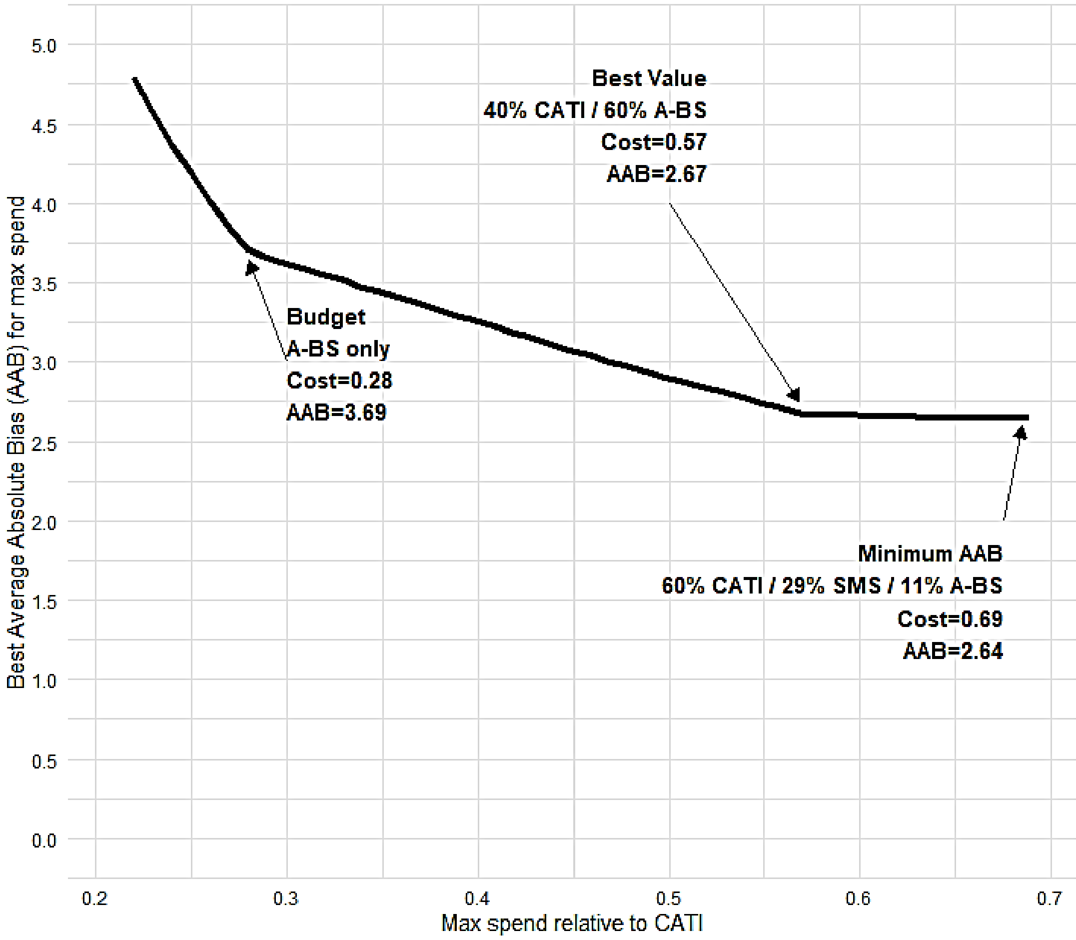
The first elbow on the left of the x-axis represents a budget option consisting only of A-BS recruitment at a cost of 28% of CATI and an AAB of 3.69. The lowest spend overall is the SMS-only mode but this produced the highest AAB.

The second elbow along the x-axis represents the best value scenario, which is a mixed-mode blend of 40% CATI and 60% A-BS at a cost of 57% of CATI and an AAB of 2.67. Beyond this point spending more yields very little reduction in bias.

For example, the lowest absolute minimum bias (AAB = 2.64) occurs at a three-mode blend of 60% CATI, 29% SMS and 11% A-BS but the improvement in bias is only 0.03 compared to the best value option despite the 12% percentage point increase in expenditure. Overall, the improvements of mixing SMS and A-BS survey modes into CATI were driven primarily by improvements in sex and state representation.

These results demonstrate that strategic blending of survey modes can substantially improve representativeness while managing costs, with A-BS playing a pivotal role in cost-effective bias reduction.

Figure 7: Best blend of survey mode by recruitment cost relative to CATI



General conclusions

This study provides a comprehensive evaluation of survey modes for a national gambling prevalence survey. It examines not only cost-effectiveness and operational efficiency but also the impact of the survey method and survey framing on key gambling-related outcomes.

Both the survey mode and the framing of the survey significantly influenced reported rates of gambling participation and harm. Respondents who received a gambling-focused survey invitation were more likely to report gambling and gambling harm compared to those in the health survey. Online survey modes also tended to yield higher rates of gambling participation and online gambling than CATI.

Electronic gaming machines (EGMs) and wagering activities consistently accounted for the largest share of explained variance in gambling harm across all survey modes. However, the relative importance of specific gambling forms also varied by survey mode, underscoring the risk of relying on a single mode for prevalence studies.

A-BS, SMS and LinA all achieved markedly lower CPC than CATI, with the LinA panel being the most cost-effective, followed by SMS and address-based sampling (A-BS). LinA also achieved the highest yield and shortest fieldwork period, while CATI and SMS yielded much lower response rates over longer periods. A-BS provided moderate yield but required extended fieldwork due to mail logistics. LinA produced the sample most closely aligned with population benchmarks, followed by CATI, A-BS and then SMS.

Simulation of mixed-mode recruitment strategies demonstrated that blending survey modes can substantially improve representativeness while managing costs. The optimal blend for minimising bias was found to be 60% CATI, 29% SMS and 11% A-BS, though two-mode blends (e.g. 41% CATI and 59% A-BS) achieved nearly equivalent reductions in bias at a lower cost. A-BS emerged as the most efficient single-mode alternative for bias reduction per additional cost.

Overall, these findings underscore the critical importance of survey mode selection and survey design in shaping the financial sustainability, inclusivity and representativeness of national gambling prevalence data. The findings support the adoption of strategic mixed-mode designs tailored to study objectives and resource constraints.

Looking ahead

Prevalence data are critical for evidence-based policy decision-making (Migliavaca et al., 2020). Policy and program evaluations done in Australia often lack pre-intervention data (baseline data), and data collection for evaluations are often done after the intervention occurs, making it difficult to evaluate impacts.

Prevalence data provide the critical baseline data needed to conduct sound evaluation in line with the Australian Government's directives around impact analysis[4] and evaluation.[5] Collecting annual prevalence data will also align Australia's gambling research with that of international peers such as the United Kingdom, Canada, New Zealand, Sweden and Norway.

One of the 31 recommendations from the 'You win some, you lose more' parliamentary inquiry into online gambling was to provide ongoing funding for prevalence studies on online gambling harm (House of Representatives Standing Committee on Social Policy and Legal Affairs, 2023). The routine collection of prevalence data will provide the Australian Government with information to support future policy around mitigating gambling-related harm.

References

American Association for Public Opinion Research (AAPOR). (2023). *Standard definitions: Final dispositions of case codes and outcome rates for surveys. 10th edition.* AAPOR.

Ashford, R., Bates, B., Bergli, C., Purdon, S., Bryson, C., & Wardle, H. (2022). *Gambling participation and the prevalence of problem gambling survey: Pilot stage methodology review report*. The Gambling Commission.

Australia Post. (2015). *Better connections: Less clutter, more engagement. Australia Post Consumer Survey Report.* Australia Post. smartcomm.net.au/wp-content/uploads/2022/09/australia-post_mail-continues-to-deliver.pdf

Australian Bureau of Statistics (ABS). (2023). *Types of error*. ABS. www.abs.gov.au/statistics/understanding-statistics/statistical-terms-and-concepts/types-error

Australian Communications and Media Authority (ACMA). (2024). *Communications and media in Australia series: How we communicate: Executive summary and key findings*. ACMA.

Australian Gambling Research Centre (AGRC). (2023a). *Gambling participation and experience of harm in Australia*. AGRC, Australian Institute of Family Studies.

Australian Gambling Research Centre. (2023b). *Gambling participation, experience of harm and community views: An overview*. AGRC, Australian Institute of Family Studies.

4 Australian Government Guide to Policy Impact Analysis | The Office of Impact Analysis
5 Impact evaluation | evaluation.treasury.gov.au

Baker, R., Blumberg, S. J., Brick, J. M., Couper, M. P., Courtright, M., Dennis, J. M. et al. (2010). Research synthesis: AAPOR report on online panels. *Public Opinion Quarterly*, *74*(4), 711–781. doi.org/10.1093/poq/nfq048

Baker, R. P. (1992). New technology in survey research: Computer-assisted personal interviewing (CAPI). *Social Science Computer Review*, *10*(2), 145–157. doi.org/10.1177/089443939201000202

Beach, T. (2025, March 13). *How we're raising the alarm on potentially suspicious phone calls*. Telstra. www.telstra.com.au/exchange/suspicious-phone-calls--what-telstra-is-doing-to-raise-the-alarm

Broich, C., Eftimova, D., Nikolova, K., & Jovanovski, N. (2019). *Data collection mode change: Going from CAPI to CATI. The case of Greece*. (A WAPOR Paper). www.academia.edu/100627178/Data_collection_mode_change_Going_from_CAPI_to_CATI_the_case_of_Greece

Browne, M., Delfabbro, P., Thorne, H. B., Tulloch, C., Rockloff, M. J., Hing, N. et al. (2023). Unambiguous evidence that over half of gambling problems in Australia are caused by electronic gambling machines: Results from a large-scale composite population study. *Journal of Behavioral Addictions*. doi.org/10.1556/2006.2022.00083

Callegaro, M., Baker, R., Bethlehem, J., Göritz, A. S., Krosnick, J. A., & Lavrakas, P. J. (2014). Online panel research. *Online Panel Research: Data Quality Perspective, A*, 1–22.

Callegaro, M., Villar, A., Yeager, D., & Krosnick, J. A. (2014). A critical review of studies investigating the quality of data obtained with online panels based on probability and nonprobability samples 1. *Online Panel Research: Data Quality Perspective, A*, 23–53.

Coffey, S., Maslovskaya, O., & McPhee, C. (2024). Recent innovations and advances in mixed-mode surveys. *Journal of Survey Statistics and Methodology*, *12*(3), 507–531.

Cornesse, C., Blom, A. G., Dutwin, D., Krosnick, J. A., De Leeuw, E. D., Legleye, S. et al. (2020). A review of conceptual approaches and empirical evidence on probability and nonprobability sample survey research. *Journal of Survey Statistics and Methodology*, *8*(1), 4–36. doi.org/10.1093/jssam/smz041

de Bruijne, M., & Kalwij, A. (2024). *Switching survey mode between CAPI and CAWI: A report from the field*. doi.org/10.17617/wp.932024

Elliott, R. (2021, April 20). CAPI, CATI and CAWI research methods. *GeoPoll*. www.geopoll.com/blog/capi-cati-cawi-research-methods/

Ferris, J. A., & Wynne, H. J. (2001). *The Canadian Problem Gambling Index: Final report*. Canadian Centre on Substance Abuse.

GIIRAC. (2025, May 10). *CAPI, CAWI, CATI, PAPI: Choosing the right data collection mode* (Blog). GIIRAC. giirac.com/capi-cawi-cati-papi-choosing-the-right-data-collection-mode/

H2 Gambling Capital. (2025). *H2 Global all product summary*. H2 Gambling Capital. h2gc.com

Heirene, R. M., Cobb-Clark, D., Tymula, A., Santos, T., & Gainsbury, S. M. (2025). Non-response bias in gambling surveys. *International Gambling Studies*, *1*(1), 1–24. doi.org/10.1080/14459795.2025.2530106

House of Representatives Standing Committee on Social Policy and Legal Affairs. (2023). *You win some, you lose more* [Report No. 4 of the 47th Parliament]. Standing Committee on Social Policy and Legal Affairs. www.aph.gov.au/Parliamentary_Business/Committees/House/Social_Policy_and_Legal_Affairs/OnlineGambling/Report

Kish, L. (1995). *Survey sampling*. Wiley.

Kreuter, F., Presser, S., & Tourangeau, R. (2008). Social desirability bias in CATI, IVR, and web surveys: The effects of mode and question sensitivity. *Public Opinion Quarterly*, *72*(5), 847–865. doi.org/10.1093/poq/nfn063

Lindeman, R. H., Merenda, P. F., Gold, R. Z., Lindemann, R. H., & Merenda, P. F. (1980). *Introduction to bivariate and multivariate analysis*. Scott, Foresman and Co.

Lugtig, P., Das, M., & Scherpenzeel, A. (2014). Nonresponse and attrition in a probability-based online panel for the general population. In *Online Panel Research* (pp. 135–153). John Wiley & Sons, Ltd. doi.org/10.1002/9781118763520.ch6

Migliavaca, C. B., Stein, C., Colpani, V., Munn, Z., & Falavigna, M. (2020). Quality assessment of prevalence studies: A systematic review. *Journal of Clinical Epidemiology*, *127*, 59–68. doi.org/10.1016/j.jclinepi.2020.06.039

Olson, K., Smyth, J. D., Horwitz, R., Keeter, S., Lesser, V., Marken, S. et al. (2021). Transitions from telephone surveys to self-administered and mixed-mode surveys: AAPOR task force report. *Journal of Survey Statistics and Methodology*, *9*(3), 381–411.

Pennay, D., Phillips, B., Neiger, D., Ward, A., Slamowicz, S., & Lethborg, A. (2023). *Results from the 2022 Australian Comparative Study of Survey Methods (ACSSM)*. The Social Research Centre. srcentre.com.au/wp-content/uploads/2023/12/ACSSM-Analytical-Report-20231005.pdf

Phillips, B., Neiger, D., Ward, A., Slamowicz, S., & Lethborg, A. (2023). *Australian Comparative Study of Survey Methods: Technical report*. srcentre.com.au/wp-content/uploads/2024/01/ACSSM-Technical-Report-with-Appendices.pdf

Pierannunzi, C., Gamble, S., Locke, R., Freedner, N., & Town, M. (2019). Differences in efficiencies between ABS and RDD samples by mode of data collection. *Survey Practice*, *12*(1), 1.

Queensland Government Statistician's Office. (2025). *Australian gambling statistics, 40th edition, 1998–99 to 2023–24*. Queensland Government Statistician's Office.

Roy Morgan. (2024, October 30). *Roy Morgan invests in human-centric research, returning to face-to-face interviewing.* Roy Morgan Research. www.roymorgan.com/findings/9721-roy-morgan-returns-to-face-to-face-interviewing-for-single-source-in-2025

Smith, T. W., & Kim, J. (2015). *A review of survey data-collection modes (No. 2).* Japanese Association for Mathematical Sociology. doi.org/10.11218/ojjams.30.185

Stadtmüller, S., Beuthner, C., & Silber, H. (2021). *Mixed-mode surveys (GESIS Survey Guidelines)* (Version 1.0). GESIS – Leibniz Institute for the Social Sciences. doi.org/10.15465/GESIS-SG_EN_038

StataCorp. (2025). *Stata statistical software: Release 19.* StataCorp LLC. [Computer software].

Sturgis, P. (2020). *An assessment of the accuracy of survey estimates of the prevalence of problem gambling in the United Kingdom*. GambleAware.

Sturgis, P., & Kuha, J. (2021). *Methodological factors affecting estimates of the prevalence of gambling harm in the United Kingdom: A multi-survey study.* GambleAware.

Sturgis, P., & Kuha, J. (2022). How survey mode affects estimates of the prevalence of gambling harm: a multisurvey study. *Public Health, 204,* 63-69. doi.org/10.1016/j.puhe.2021.12.014

Sturgis, P., Kuha, J., Howe, S., & Maxineanu, I. (2025). *Three experiments on the causes of differences in estimates of gambling and gambling impacts in general population surveys*. London School of Economics and Political Science.

Tillman, G., Irving, R., Wickramasinghe, S., Pappu, T., Budinski, M., Greer, N. et al. (2025a). *National Gambling Prevalence Study Pilot 2024: Key findings*. Australian Gambling Research Centre, Australian Institute of Family Studies.

Tillman, G., Sakata, K., Greer, N., Myles, D., Budinski, M., Wickramasinghe, S. et al. (2025b). *Regular online bettors in Australia, 2023*. Australian Gambling Research Centre, Australian Institute of Family Studies.

Williams, R. J., & Volberg, R. A. (2009). Impact of survey description, administration format, and exclusionary criteria on population prevalence rates of problem gambling. *International Gambling Studies*, *9*(2), 101–117. doi.org/10.1080/14459790902911653