2019/20 AusPlay Sampling and Weighting Methodology Revision

Overview – April 2020

Revised methodology for AusPlay from July 2019

Original methodology

Since its inception on 22 October 2015, until 30 June 2019, the methodology used to collect and analyse the AusPlay survey responses remained the same. The 20,000 annual responses were collected using an overlapping dual sample frame design, where 50% of the interviews were conducted via landline and 50% via mobile telephone. This ensured almost full coverage of the Australian population but the weighting process required to produce the estimates had the disadvantage of relatively high Relative Standard Errors (RSEs).

During analysis, the weighting calculations also used the Estimated Resident Population (ERP) projections from the Australian Bureau of Statistics (ABS) to ensure the sample was representative of the Australian population. This process used ERPs based on the 2011 Census.

Revised methodology

From 1 July 2019, a revised methodology has been implemented, with the main changes being:

- a move to a single 100% mobile sample frame, and
- updated weighting calculations that:
  – are appropriate for the revised sampling method
  – reflect the latest ERP projections based on the 2016 Census, and
  – allow improved representation of finer age groups, for example 15-17, 18-19 and 20-24 year olds within the 15-24 group.

Full details of these changes can be found here.

The 30 April 2020 release of AusPlay – covering data collected in the 2019 calendar year – is the first to include any results using this revised methodology.

Why revise the methodology?

The main driver for revising the methodology was the change in the structure of phone ownership in Australia since the survey started.

Between October 2015 and December 2018, the Roy Morgan Telephone Ownership Population Estimates showed that the percentage of the population aged 15+ who were accessible on a landline fell from 69.5% to 49.8%. Over the same period, the percentage of the population aged 15+ with a mobile phone increased slightly from 95.3% to 96.1%. This large change in telephone ownership profile led to increasing sample errors which could only be addressed by either increasing the share of the mobile sample from 50% to 70% or a move to a single 100% mobile sample frame. A review of the sample design was also necessitated by the ageing profile of the landline sample which led in turn to reductions in the child sample size. Consideration of these issues led to a decision to move to a single 100% mobile sample frame.

A secondary driver for the methodology change was the publication in December 2018 of updated ABS ERP projections, based on the 2016 Census.

Each of these changes on their own have the potential to cause a break in the AusPlay time series, but they also improve the quality of the data going forward. Implementing both changes at the same time minimises the disruption to the time series while ensuring high quality and relevant data is provided.

Full details of the different methodology options considered and how the decision was made to go ahead with this are available for [download](#).

What is the impact of these changes?

In summary, the statistical impact of the design and weighting changes on the AusPlay outputs are as follows:

1. The change to a single frame design significantly reduces the standard errors for both adult and child estimates. The changes to the weighting approach associated with this change ensures that best practice weighting design is used but has no other inherent benefits.

2. The change to a single frame excludes the landline population. However, the impact of this is likely to be marginal as this population accounts for less than 3% of all phone users.

3. The use of revised ERP projections ensures consistency of AusPlay estimates with ABS ERP values.

4. The use of the finer age weighting for adults in the revised weighting approach ensures better consistency with ABS ERP values for these age groups (eg 15-17, 18-19, 20-24).

When methodology changes such as these are applied, some realignment of participation *estimates* can be expected. This realignment does not necessarily affect participation *rates* since the population that rates are based on will also have realigned. Hence there is less expectation of changes in participation *rates*.

Sport Australia conducted an in-depth analysis of the possible consequences of the changes by comparing 2018 outputs using both the original weighting design and the revised weighting design. Some realignment in participation *estimates* was apparent but, as expected, these were generally within the margin of error. This means that differences seen because of the methodology changes are no greater than differences due to the data being collected from a sample of the population rather than the entire population.

Furthermore, as expected, the differences in estimates translated into very minor changes in participation *rates.*

As with all data of this nature, users are advised to use caution when comparing year-on-year estimates. This is especially important when looking at sub-groups that are relatively small in size, since these have higher margins of error. Now that AusPlay has been running for some time, with over four years of data available, there is greater capacity to concentrate on longer term trends rather than short term fluctuations.

For state and territory estimates

The change in sample design to 100% mobile simplified the weighting process, resulting in a reduction in the relative standard errors (RSEs) associated with the participation estimates for all states and territories except the ACT. In the ACT, the change in the RSE is not large, increasing by just 3.7%.

The updated ERPs from the ABS had a greater impact on the projected populations of Western Australia, Victoria and the Northern Territory than other jurisdictions. To ascertain whether, or how much, this fed into participation estimates Sport Australia conducted a test where the 2018 AusPlay data were weighted using both the original and the revised methodology.

The analysis found that any differences in both participation *estimates* and *rates* between the two methodologies were within the relative margins of error for all jurisdictions except Western Australia. For Western Australia, the change in ERP did have a flow on effect on the *estimates* beyond the margins of error but did not have a significant effect on participation *rates*. This reiterates the importance of considering *both* estimates and rates when conducting analysis.

Tables 1 and 2 show the results of this analysis for once per year and once per week participation among adults for the states and territories and for Australia overall.

Table 1: 2018 at least once per year participation estimates and rates using original and revised design and weighting methods for states and territories (adults)

Jurisdiction	Estimates using original sample design and weighting (000)	Estimates using revised sample design and weighting (000)	Participation rates using original sample design and weighting (%)	Participation rates using revised sample design and weighting (%)
ACT	327.2	327.3	95.5%	95.9%
NSW	5,790.6	5,921.9	90.2%	90.8%
NT	174.7	173.5	85.7%	88.7%
Qld	3,687.7	3,590.3	89.1%	88.8%
SA	1,306.9	1,294.2	90.2%	90.6%
Tas	376.1	377.0	87.0%	87.0%
Vic	4,676.6	4,853.4	91.6%	91.8%
WA	2,119.5	1,890.5	89.9%	90.4%
Australia	18,459.3	18,428.1	90.3%	90.3%

Table 2: 2018 at least once per week participation estimates and rates using original and revised design and weighting methods for states and territories (adults)

Jurisdiction	Estimates using original sample design and weighting (000)	Estimates using revised sample design and weighting (000)	Participation rates using original sample design and weighting (%)	Participation rates using revised sample design and weighting (%)
ACT	302.6	301.2	88.3%	88.2%
NSW	5,286.1	5,382.9	82.3%	82.6%
NT	154.2	149.2	75.6%	76.3%
Qld	3,333.5	3,233.1	80.5%	80.0%
SA	1,179.3	1,167.1	81.4%	81.7%
Tas	348.6	347.1	80.6%	80.1%
Vic	4,312.2	4,483.0	84.5%	84.8%
WA	1,933.3	1,721.6	82.0%	82.3%
Australia	16,849.7	16,785.1	82.4%	82.5%

The same analysis was conducted on estimates and rates for children's participation (Tables 3 and 4). In this case, the realignment of both *estimates* and *rates* were found to be within the relative margins of error for all states and territories.

Table 3: 2018 at least once per year participation estimates and rates using original and revised design and weighting methods for states and territories (children)

Jurisdiction	Estimates using original sample design and weighting (000)	Estimates using revised sample design and weighting (000)	Participation rates using original sample design and weighting (%)	Participation rates using revised sample design and weighting (%)
ACT	66.6	67.1	83.5%	83.3%
NSW	1,159.3	1,174.8	78.1%	78.4%
NT	37.4	33.4	64.0%	61.3%
Qld	697.0	640.9	67.5%	65.2%
SA	257.7	253.2	81.6%	82.1%
Tas	79.5	72.7	82.5%	77.3%
Vic	910.1	911.8	78.3%	76.2%
WA	413.9	377.8	72.9%	74.1%
Australia	3,621.6	3,531.7	75.5%	74.7%

Table 4: 2018 at least once per week participation estimates and rates using original and revised design and weighting methods for states and territories (children)

Jurisdiction	Estimates using original sample design and weighting (000)	Estimates using revised sample design and weighting (000)	Participation rates using original sample design and weighting (%)	Participation rates using revised sample design and weighting (%)
ACT	53.2	51.1	66.7%	63.4%
NSW	912.3	926.4	61.4%	61.8%
NT	26.4	20.8	45.3%	38.2%
Qld	501.3	465.2	48.6%	47.3%
SA	151.1	151.8	47.8%	49.3%
Tas	66.8	61.6	69.4%	65.5%
Vic	711.4	703.7	61.2%	58.8%
WA	313.2	280.4	55.2%	55.0%
Australia	2,735.7	2,661.1	57.0%	56.3%

Similar analysis using the original and revised finer age group weighting calculations also revealed no changes to participation *estimates* or *rates* outside the margins of error for each state or territory.

That said, if comparisons are being made across time, particularly for 15-17 and 18-24 year olds, it is always worth keeping methodology revisions in mind. This is noted where relevant in the published tables.

For individual sport estimates

As with any survey data, the smaller the size of the sub-group, the greater the margin of error. Thus, sports with lower numbers of participants have higher RSEs than those with higher participant numbers.

Sport Australia conducted analysis of 2018 participation estimates and rates using both the original and revised weighting calculations to determine how much the outputs for individual sports would be affected by the change in methodology. The examples in Table 5 (incorporating a high, medium and low-level participation sport) illustrate that the methodology changes have not significantly impacted the participation *estimates* or *rates* for individual sports.

Table 5: 2018 at least once per year participation estimates and rates using original and revised design and weighting methods for three sports (adults)

Example sport	Estimates using original sample design and weighting (000)	Estimates using revised sample design and weighting (000)	Participation rates using original sample design and weighting (%)	Participation rates using revised sample design and weighting (%)
Sport A	2,381.0	2,410.6	11.64%	11.85%
Sport B	201.1	193.3	0.98%	0.95%
Sport C	50.5	47.7	0.25%	0.23%

Table 6 shows the differences in estimates for these examples alongside the percentage change and their relative margins of error (at the 95% confidence level). It is clearly seen that the differences for each of these sports fall well within the margins of error. This is the case for almost all sports, with only a small number where the difference is at the outer limit of the margin of error.

Table 6: Percentage differences between 2018 at least once per year estimates and rates using original and revised design and weighting methodology for three sports (adults)

Example sport	Estimates using original sample design and weighting (000)	Estimates using revised sample design and weighting (000)	Percentage difference	Relative margin of error*
Sport A	2,381.0	2,410.6	1.2%	+/- 6%
Sport B	201.1	193.3	3.9%	+/- 18%
Sport C	50.5	47.7	5.6%	+/- 35%

*relative margins of error are approximate, based on those for estimates of 2,000,000, 200,000 and 50,000.

Tables 7 and 8 show the same analysis of estimates and rates for children's participation in three (different) sports with high, medium and lower levels of participation. Again, the differences between the two methodologies are well within the margins of error.

Table 7: 2018 at least once per year participation estimates and rates using original and revised design and weighting methods for three sports (children)

Example sport	Estimates using original sample design and weighting (000)	Estimates using revised sample design and weighting (000)	Participation rates using original sample design and weighting (%)	Participation rates using revised sample design and weighting (%)
Sport D	484.1	485.5	10.1%	10.3%
Sport E	108.1	101.5	2.3%	2.1%
Sport F	10.5	11.3	0.22%	0.24%

Table 8: Percentage differences between 2018 at least once per year estimates and rates using original and revised design and weighting methodology for three sports (children)

Example sport	Estimates using original sample design and weighting (000)	Estimates using revised sample design and weighting (000)	Percentage difference	Relative margin of error*
Sport D	484.1	485.5	0.3%	+/- 15%
Sport E	108.1	101.5	6.2%	+/- 33%
Sport F	10.5	11.3	7.5%	+/- 104%

*relative margins of error are approximate, based on those for estimates of 500,000, 100,000 and 10,000.

Further information

These sample design and weighting changes were made after an exploration of various options undertaken with the assistance of ENGINE, the independent consultants who conduct the AusPlay survey. More detailed information on the changes and weighting calculations, including the various options that were explored, can be found in the following document.

Technical Details of 2019/20 AusPlay Sample Design and Weighting Changes

Alternatively, any queries can be directed to: ausplay@sportaus.gov.au.