



AUSPLAY: METHODOLOGY REPORT 2020-21

Covering the data collection period July 1, 2020 to June 30, 2021

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December 9, 2021

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1 INTRODUCTION

1.1 SURVEY OVERVIEW

The AusPlay Survey (AusPlay) is a large-scale national population tracking survey funded and led by the Australian Sports Commission (ASC). It fills a major gap in national sport and physical recreation data following the Australian Bureau of Statistics' (ABS) decision in June 2014 to cease funding for all sport and recreation data collection.

AusPlay is the first national survey in Australia to collect adult and children's sport and physical recreation participation data on the same annual survey vehicle. ENGINE was appointed by the ASC in 2015 to deliver AusPlay, following an open tendering process.

The three main objectives of AusPlay are to:

1. Provide insights to help sports grow participation and track trends
2. Provide data that informs government investment, policy, and program delivery; and
3. Identify and describe links between sport participation and other influential factors.

1.2 PURPOSE OF THIS REPORT

AusPlay data collection commenced in October 2015. This sixth methodological report covers the: sample design; data collection; weighting; and margin of error calculations, as they relate to the survey data collected from July 1, 2020 to June 30, 2021.

Separate documents with detailed information on the survey questions and key terms and definitions used in AusPlay reporting can be accessed on the [Clearinghouse for Sport](#).

2 SAMPLE DESIGN

2.1 TARGET POPULATION

The target population for AusPlay is all Australian residents. Randomly selected Australian residents aged 15 years and over are interviewed directly in a CATI interview. Children aged 0-14 are covered by interviewing adult respondents, who are parents or guardians of at least one child in their household, about one randomly selected child.

2.2 SAMPLE DESIGN

From the start of AusPlay in Q4, 2015 until Q2, 2019 the AusPlay sample design was a dual frame overlapping design with 50% of the sample being from a landline frame and 50% from a random digit dialling (RDD) mobile phone frame. In Q3, 2019 the sample design changed to a single frame RDD mobile design (100% mobile design).

2.3 ANNUAL SAMPLE SIZE

The AusPlay target sample size in 2020/21 was 20,000 (aged 15+), spread equally across the year. The sample size achieved was 20,021 (Persons 15+), with a corresponding achieved child sample size of 3,666. Further details are set out in Table 1 below.

2.4 RANDOM RESPONDENT SELECTION

2.4.1 Adult selection

The owner of the mobile was approached for an interview. Up to 5 call-backs were made to attempt to obtain an interview.

2.4.2 Child selection

For each adult respondent who was a parent or guardian of at least one child in their household one child was selected using the last birthday method. The adult respondent completed the AusPlay questionnaire child section as it related to the selected child.

2.5 SAMPLE FRAME

The RDD mobile phone sample frame was obtained from *SamplePages*.

3 DATA COLLECTION

3.1 INTERVIEWING

Interviewing was conducted from ENGINE’s dedicated CATI facility in Melbourne. The team of interviewers selected were briefed specifically on the project prior to the commencement of the fieldwork.

This report covers the fieldwork period from July 1, 2020 to June 30, 2021. In this period a total of 20,021 interviews were conducted amongst adults aged 15 years and over. Of these respondents 3,666 completed the AusPlay questionnaire child section for a randomly selected child aged 0-14 (selected using the last birthday method). Interviews were conducted continuously over the year.

Interviewing was carried out in compliance with ISO 20252 and membership requirements for Association of Market and Social Research Organisations (AMSRO) and the Research Society (formerly the Australian Market and Social Research Society (AMSRS)).

The table below shows the adult and child sample sizes achieved for the states and territories.

Table 1. Adult and child sample achieved by state/territory (2020-21)

State	Adult sample	Child sample
NSW	6,601	1,228
Vic	5,108	905
Qld	3,633	684
SA	1,447	239
WA	1,983	363
Tas	480	81
NT	183	40
ACT	586	126
Total	20,021	3,666

3.2 RESPONSE RATE

The response rate is set out below, using the internationally recognised AAPOR (American Association for Population Opinion Research) standard for calculating response rates.

Table 2. Response rate (2020-21)

AAPOR Response Rate: July 1, 2020 - June 30, 2021			
		<i>No answer</i>	950
		<i>Answering machine</i>	37,383
		<i>Engaged</i>	300
		<i>Other non-contact</i>	
A	Total Contact Not Made - Eligibility Unknown		38,633
		<i>Disconnected / Invalid number - phone not connected</i>	4,133
		<i>Business number/paging service</i>	1
		<i>Incoming call restriction (blocks)</i>	3
		<i>Fax / 'Killed'</i>	3,375
B	Total Contact Not Made - Not Eligible		7,512

AAPOR Response Rate: July 1, 2020 - June 30, 2021			
1) Total contact not made (A+B)			46,145
	<i>Call back or appointment scheduled</i>	371	
	<i>Total language barrier</i>	6,006	
	<i>Refused - non-specified</i>	92	
	<i>Refused- Eligibility Unknown</i>	116,960	
C	Total Contact Made - Eligibility Unknown		123,429
	<i>Out of scope - Aged under 15</i>	410	
	<i>Out of scope - residency status</i>	283	
	<i>Refused - Age question</i>	65	
	<i>Refused - residency status</i>	32	
D	Total Contact Made - Not eligible (out-of-scope)		790
E	Contact made - Eligible (completed interviews)		20,021
	<i>Respondent terminate at QRES1a or later</i>	133	
	<i>Not proceeding for other reason</i>	0	
	<i>Refused - Eligible</i>	8,245	
	<i>Refused- parent refused for 15-17yo</i>	136	
	<i>Call-backs made without success</i>	0	
	<i>Total incapable</i>	950	
F	Total Contact made - Eligible (non-complete)		9,464
2) Total contact made (C+D+E+F)			153,704
Total finalised outcomes (1+2)			199,849
G	Eligibility rate *		97%
H	Expected eligible from unknown		157,833
J	Total estimated Eligible		187,318
RR	Response Rate		11%

4 WEIGHTING

Weights were calculated for each of the four quarterly sets of data for 2020-21. The weighting process was carried out as follows:

4.1 WEIGHTS FOR THE ADULT SAMPLE

Weighting cells were defined by (1) part-of-state x (2) gender x age. These weighting cells are shown in the tables below. The part-of-state cells and the gender x age weighting cells used were as follows:

Table 3. AusPlay part-of-state weighting cells

Stratum
Sydney
Rest of New South Wales
Melbourne
Rest of Victoria
Brisbane
Rest of Queensland
Adelaide
Rest of South Australia
Perth
Rest of Western Australia
Tasmania
Northern Territory
Australian Capital Territory

Table 4. Age x gender weighting cells

Gender	Age
Female	15-24
Female	25-34
Female	35-44
Female	45-54
Female	55-64
Female	65+
Male	15-24
Male	25-34
Male	35-44
Male	45-54
Male	55-64
Male	65+

The combination of 13 geographic and 12 age x gender weighting cells resulted in $13 \times 12 = 156$ weighting cells. In order to avoid unduly large weights, weighting cells were collapsed if the sample size was less than 5. Weighting cells were collapsed across adjacent age groups but not across gender or part-of-state.

Estimated Resident Population (ERP) data for the 156 weighting cells are available on a quarterly basis.

The initial probabilities of selection for the adult sample (persons 15+) were calculated as the number of active mobile phones used by the mobile phone respondent, capped to a maximum of 3 for each respondent. The initial weights were the inverse of the initial probabilities of selection.

The final weights were calculated by calibrating the initial weights so that the sum of weights for each weighting cell was equal to the ERP value for that cell.

4.2 WEIGHTS FOR THE CHILD SAMPLE

The starting point for the child weights was the adult weight for respective adult respondents. The probability of selection of children is inversely proportional to the number of children aged 0-14 in the household. In order to account for this probability of selection the adult weight was multiplied by the number of children aged 0-14 in the household. A further weight adjustment was made which divided the child weight by the number of adults in the household who could have reported the selected child. This adjustment accounts for the fact that the adult weights project to all adults in the population, not just the selected adults.

The final child weights were calculated by a rim-weighting process using two ABS ERP rim values: (1) the quarterly ERP values by age (0-4, 5-8, 9-11, and 12-14) x gender at the national level; and (2) the quarterly ABS child (0-14) ERP values for states and territories. This ensured the weighted child estimates were identical to the two ABS ERP rim values. This form of rim-weighting for child weights was used for the first time in the September quarter 2017 weight calculations. The previous approach was a rim-weight using only the quarterly child ABS ERP age ranges (0-4, 5-8, 9-11, 12-14) x gender totals. This revised approach was introduced to reduce the variability in state and territory child estimates across time.

4.3 USING THE WEIGHTS

The weights for each quarter were designed so that any quarter's sample could be projected to the full population of Australia. One consequence of this is that the sum of the adult weights equals the ERP adult value for that quarter.

This means, however, that the sum of the adult weights for the combined first four quarters of data will equal four times the average ERP adult value for Australia for that period. The weights provided by ENGINE for the combined first four quarters of data were divided by 4 to account for this issue.

This principle should be used whenever quarterly data is combined to form multi-quarter data. In general, if q quarters of weighted data are to be combined for analysis of that combined time period the quarterly weights should all be divided by q.

5 SAMPLE ERROR ESTIMATES

5.1 STANDARD ERRORS

The AusPlay results are based on a sample and are therefore subject to sample error. Sample error is measured by the standard error (SE) and the margin of error (MOE). Knowledge of the standard error, or the margin of error, enables the 95% confidence intervals to be constructed around survey results and also enables statistical significance testing to be carried out.

The 95% confidence interval for a survey result is calculated as the survey result plus or minus 1.96 x the standard error. For example, if a survey result of 100,000 has a standard error of 10,000 then the 95% confidence interval is 100,000 +/- (1.96 x 10,000) = 100,000 +/- 19,600 = (80,400 – 119,600).

The relative standard error (RSE) for a particular survey result is the standard error divided by the survey result, expressed as a percentage. The standard errors and the relative standard errors of a range of AusPlay adult and child results are summarised in the four tables below.

The following example demonstrates the use of these tables for annual estimates. Consider an annual survey result for NSW of 200,000 from the adult sample (e.g. 200,000 play golf). The table below shows that the standard error for this result is 15,100 (rounded to the nearest hundred). This means the 95% confidence interval for the survey result is 200,000 +/- 1.96 x 15,100 = 200,000 +/- 29,600 = (170,400 - 229,600).

Table 5. Standard errors of annual adult estimates (2020-21)

Size of estimate	NSW (no.)	Vic (no.)	Qld (no.)	SA (no.)	WA (no.)	Tas (no.)	NT (no.)	ACT (no.)	Australia (no.)
1,000	1,100	1,100	1,100	1,100	1,100	1,000	1,100	800	1,100
2,000	1,500	1,600	1,600	1,600	1,600	1,500	1,600	1,200	1,600
5,000	2,400	2,500	2,600	2,500	2,500	2,300	2,600	1,900	2,500
10,000	3,400	3,500	3,600	3,500	3,500	3,300	3,600	2,700	3,500
20,000	4,800	4,900	5,100	4,900	5,000	4,700	5,100	3,800	4,900
50,000	7,600	7,800	8,100	7,800	7,900	7,400	8,100	6,000	7,800
100,000	10,700	11,000	11,500	11,000	11,100	10,400	11,400	8,500	11,000
200,000	15,100	15,600	16,300	15,500	15,700	14,800	-	12,000	15,500
500,000	24,000	24,700	25,700	24,600	24,900	-	-	-	24,600
800,000	30,300	31,200	32,500	31,100	31,500	-	-	-	31,100
1,000,000	33,900	34,900	36,300	34,700	35,200	-	-	-	34,700
1,500,000	41,500	42,800	44,500	-	43,100	-	-	-	42,600
2,000,000	47,900	49,400	51,400	-	49,800	-	-	-	49,100
5,000,000	75,700	78,100	-	-	-	-	-	-	77,700
8,000,000	-	-	-	-	-	-	-	-	98,300

Table 6. Relative standard errors of annual adult estimates (2020-21)

Size of estimate	NSW (%)	Vic (%)	Qld (%)	SA (%)	WA (%)	Tas (%)	NT (%)	ACT (%)	Australia (%)
1,000	110.0%	110.0%	110.0%	110.0%	110.0%	100.0%	110.0%	80.0%	110.0%
2,000	75.0%	80.0%	80.0%	80.0%	80.0%	75.0%	80.0%	60.0%	80.0%
5,000	48.0%	50.0%	52.0%	50.0%	50.0%	46.0%	52.0%	38.0%	50.0%
10,000	34.0%	35.0%	36.0%	35.0%	35.0%	33.0%	36.0%	27.0%	35.0%
20,000	24.0%	24.5%	25.5%	24.5%	25.0%	23.5%	25.5%	19.0%	24.5%
50,000	15.2%	15.6%	16.2%	15.6%	15.8%	14.8%	16.2%	12.0%	15.6%
100,000	10.7%	11.0%	11.5%	11.0%	11.1%	10.4%	11.4%	8.5%	11.0%
200,000	7.6%	7.8%	8.2%	7.8%	7.9%	7.4%	-	6.0%	7.8%
500,000	4.8%	4.9%	5.1%	4.9%	5.0%	-	-	-	4.9%
800,000	3.8%	3.9%	4.1%	3.9%	3.9%	-	-	-	3.9%
1,000,000	3.4%	3.5%	3.6%	3.5%	3.5%	-	-	-	3.5%
1,500,000	2.8%	2.9%	3.0%	-	2.9%	-	-	-	2.8%
2,000,000	2.4%	2.5%	2.6%	-	2.5%	-	-	-	2.5%
5,000,000	1.5%	1.6%	-	-	-	-	-	-	1.6%
8,000,000	-	-	-	-	-	-	-	-	1.2%

Table 7. Standard errors of annual child estimates (2020-21)

Size of estimate	NSW (no.)	Vic (no.)	Qld (no.)	SA (no.)	WA (no.)	Tas (no.)	NT (no.)	ACT (no.)	Australia (no.)
1,000	1,400	1,400	1,500	1,600	1,500	1,300	1,500	1,100	1,500
2,000	2,000	2,000	2,200	2,200	2,100	1,900	2,100	1,500	2,100
5,000	3,100	3,200	3,400	3,500	3,300	2,900	3,300	2,400	3,200
10,000	4,400	4,600	4,800	5,000	4,700	4,200	4,600	3,400	4,600
20,000	6,200	6,500	6,800	7,000	6,600	5,900	6,500	4,700	6,500
50,000	9,800	10,200	10,800	11,100	10,500	9,300	10,300	7,500	10,300
100,000	13,900	14,400	15,300	15,700	14,900	-	-	-	14,500
200,000	19,700	20,400	21,600	22,200	21,000	-	-	-	20,500
500,000	31,100	32,300	34,200	-	33,200	-	-	-	32,400
800,000	39,300	40,800	43,300	-	-	-	-	-	41,000
1,000,000	44,000	45,600	48,400	-	-	-	-	-	45,900
1,500,000	53,900	-	-	-	-	-	-	-	56,200
2,000,000	-	-	-	-	-	-	-	-	64,900

Table 8. Relative standard error of annual child estimates (2020-21)

Size of estimate	NSW (%)	Vic (%)	Qld (%)	SA (%)	WA (%)	Tas (%)	NT (%)	ACT (%)	Australia (%)
1,000	140.0%	140.0%	150.0%	160.0%	150.0%	130.0%	150.0%	110.0%	150.0%
2,000	100.0%	100.0%	110.0%	110.0%	105.0%	95.0%	105.0%	75.0%	105.0%
5,000	62.0%	64.0%	68.0%	70.0%	66.0%	58.0%	66.0%	48.0%	64.0%
10,000	44.0%	46.0%	48.0%	50.0%	47.0%	42.0%	46.0%	34.0%	46.0%
20,000	31.0%	32.5%	34.0%	35.0%	33.0%	29.5%	32.5%	23.5%	32.5%
50,000	19.6%	20.4%	21.6%	22.2%	21.0%	18.6%	20.6%	15.0%	20.6%
100,000	13.9%	14.4%	15.3%	15.7%	14.9%	-	-	-	14.5%
200,000	9.9%	10.2%	10.8%	11.1%	10.5%	-	-	-	10.3%
500,000	6.2%	6.5%	6.8%	-	6.6%	-	-	-	6.5%
800,000	4.9%	5.1%	5.4%	-	-	-	-	-	5.1%
1,000,000	4.4%	4.6%	4.8%	-	-	-	-	-	4.6%
1,500,000	3.6%	-	-	-	-	-	-	-	3.7%
2,000,000	-	-	-	-	-	-	-	-	3.2%

5.2 MARGINS OF ERROR

As described above, the 95% confidence interval for a survey result is calculated as the survey result plus or minus 1.96 times the standard error. The amount **1.96 times the standard error** is called the **margin of error**.

This term enables the calculation for a 95% confidence interval to be re-expressed as follows: the 95% confidence interval for a survey result is calculated as the survey result plus or minus the margin of error. The relative margin of error (RMOE) for a particular survey result is 1.96 x the relative standard error or the margin of error divided by the survey result, expressed as a percentage.

The margins of error and the relative margins of error of AusPlay adult and child estimates are summarised in the four tables below. It can be seen that the margin of error values in the tables below is 1.96 times the equivalent standard error values (rounded to the nearest hundred).

The following example demonstrates the use of these tables. Consider an annual survey result for NSW of 200,000 from the adult sample (e.g. 200,000 play golf). The table below shows that the margin of error for this result is 29,000. This means the 95% confidence interval for the survey result is 200,000 +/- 29,600 = (170,400 - 229,600). This is the same 95% confidence interval that was calculated in the same example above, using the standard error tables.

Table 9. Margins of error of annual adult estimates (2020-21)

Size of estimate	NSW (no.)	Vic (no.)	Qld (no.)	SA (no.)	WA (no.)	Tas (no.)	NT (no.)	ACT (no.)	Australia (no.)
1,000	2,200	2,200	2,200	2,200	2,200	2,000	2,200	1,600	2,200
2,000	2,900	3,100	3,100	3,100	3,100	2,900	3,100	2,400	3,100
5,000	4,700	4,900	5,100	4,900	4,900	4,500	5,100	3,700	4,900
10,000	6,700	6,900	7,100	6,900	6,900	6,500	7,100	5,300	6,900
20,000	9,400	9,600	10,000	9,600	9,800	9,200	10,000	7,400	9,600
50,000	14,900	15,300	15,900	15,300	15,500	14,500	15,900	11,800	15,300
100,000	21,000	21,600	22,500	21,600	21,800	20,400	22,300	16,700	21,600
200,000	29,600	30,600	31,900	30,400	30,800	29,000	-	23,500	30,400
500,000	47,000	48,400	50,400	48,200	48,800	-	-	-	48,200
800,000	59,400	61,200	63,700	61,000	61,700	-	-	-	61,000
1,000,000	66,400	68,400	71,100	68,000	69,000	-	-	-	68,000
1,500,000	81,300	83,900	87,200	-	84,500	-	-	-	83,500
2,000,000	93,900	96,800	100,700	-	97,600	-	-	-	96,200
5,000,000	148,400	153,100	-	-	-	-	-	-	152,300
8,000,000	-	-	-	-	-	-	-	-	192,700

Table 10. Relative margins of error of annual adult estimates (2020-21)

Size of estimate	NSW (%)	Vic (%)	Qld (%)	SA (%)	WA (%)	Tas (%)	NT (%)	ACT (%)	Australia (%)
1,000	220.0%	220.0%	220.0%	220.0%	220.0%	200.0%	220.0%	160.0%	220.0%
2,000	145.0%	155.0%	155.0%	155.0%	155.0%	145.0%	155.0%	120.0%	155.0%
5,000	94.0%	98.0%	102.0%	98.0%	98.0%	90.0%	102.0%	74.0%	98.0%
10,000	67.0%	69.0%	71.0%	69.0%	69.0%	65.0%	71.0%	53.0%	69.0%
20,000	47.0%	48.0%	50.0%	48.0%	49.0%	46.0%	50.0%	37.0%	48.0%
50,000	29.8%	30.6%	31.8%	30.6%	31.0%	29.0%	31.8%	23.6%	30.6%
100,000	21.0%	21.6%	22.5%	21.6%	21.8%	20.4%	22.3%	16.7%	21.6%
200,000	14.8%	15.3%	16.0%	15.2%	15.4%	14.5%	-	11.8%	15.2%
500,000	9.4%	9.7%	10.1%	9.6%	9.8%	-	-	-	9.6%
800,000	7.4%	7.7%	8.0%	7.6%	7.7%	-	-	-	7.6%
1,000,000	6.6%	6.8%	7.1%	6.8%	6.9%	-	-	-	6.8%
1,500,000	5.4%	5.6%	5.8%	-	5.6%	-	-	-	5.6%
2,000,000	4.7%	4.8%	5.0%	-	4.9%	-	-	-	4.8%
5,000,000	3.0%	3.1%	-	-	-	-	-	-	3.0%
8,000,000	-	-	-	-	-	-	-	-	2.4%

Table 11. Margins of error of annual child estimates (2020-21)

Size of estimate	NSW (no.)	Vic (no.)	Qld (no.)	SA (no.)	WA (no.)	Tas (no.)	NT (no.)	ACT (no.)	Australia (no.)
1,000	2,700	2,700	2,900	3,100	2,900	2,500	2,900	2,200	2,900
2,000	3,900	3,900	4,300	4,300	4,100	3,700	4,100	2,900	4,100
5,000	6,100	6,300	6,700	6,900	6,500	5,700	6,500	4,700	6,300
10,000	8,600	9,000	9,400	9,800	9,200	8,200	9,000	6,700	9,000
20,000	12,200	12,700	13,300	13,700	12,900	11,600	12,700	9,200	12,700
50,000	19,200	20,000	21,200	21,800	20,600	18,200	20,200	14,700	20,200
100,000	27,200	28,200	30,000	30,800	29,200	-	-	-	28,400
200,000	38,600	40,000	42,300	43,500	41,200	-	-	-	40,200
500,000	61,000	63,300	67,000	-	65,100	-	-	-	63,500
800,000	77,000	80,000	84,900	-	-	-	-	-	80,400
1,000,000	86,200	89,400	94,900	-	-	-	-	-	90,000
1,500,000	105,600	-	-	-	-	-	-	-	110,200
2,000,000	-	-	-	-	-	-	-	-	127,200

Table 12. Relative margins of error of annual child estimates (2020-21)

Size of estimate	NSW (%)	Vic (%)	Qld (%)	SA (%)	WA (%)	Tas (%)	NT (%)	ACT (%)	Australia (%)
1,000	270.0%	270.0%	290.0%	310.0%	290.0%	250.0%	290.0%	220.0%	290.0%
2,000	195.0%	195.0%	215.0%	215.0%	205.0%	185.0%	205.0%	145.0%	205.0%
5,000	122.0%	126.0%	134.0%	138.0%	130.0%	114.0%	130.0%	94.0%	126.0%
10,000	86.0%	90.0%	94.0%	98.0%	92.0%	82.0%	90.0%	67.0%	90.0%
20,000	61.0%	63.5%	66.5%	68.5%	64.5%	58.0%	63.5%	46.0%	63.5%
50,000	38.4%	40.0%	42.4%	43.6%	41.2%	36.4%	40.4%	29.4%	40.4%
100,000	27.2%	28.2%	30.0%	30.8%	29.2%	-	-	-	28.4%
200,000	19.3%	20.0%	21.2%	21.8%	20.6%	-	-	-	20.1%
500,000	12.2%	12.7%	13.4%	-	13.0%	-	-	-	12.7%
800,000	9.6%	10.0%	10.6%	-	-	-	-	-	10.1%
1,000,000	8.6%	8.9%	9.5%	-	-	-	-	-	9.0%
1,500,000	7.0%	-	-	-	-	-	-	-	7.3%
2,000,000	-	-	-	-	-	-	-	-	6.4%

5.3 USABILITY OF THE SURVEY RESULTS

It is common practice to describe the usability of annual survey results as follows:

- Results with RMOE values less than 50% are broadly reliable for most purposes
- Results with RMOE values between 50% and 100% are able to be used with caution
- Results with RMOE values greater than 100% are unreliable for general use.

A literal translation of this rule, given the result that the RMOE value is 1.96 x the RSE values, is as follows:

- Results with RSE values less than 25.5% are broadly reliable for most purposes

- Results with RSE values between 25.5% and 51% are able to be used with caution
- Results with RSE values greater than 51% are unreliable for general use.

Noting the approximation involved in these rules this could be approximated as follows:

- Results with RSE values less than 25% are broadly reliable for most purposes
- Results with RSE values between 25% and 50% are able to be used with caution
- Results with RSE values greater than 50% are unreliable for general use.

The two tables below applies these rules to show the ranges of results that are (1) **Broadly reliable** (RMOE <50%, RSE <25.5%); (2) **Should be used with caution** (50% <RMOE < 100%, 25.5% < RSE <51%); and (3) **Unreliable for general use** (RMOE > 100%, RSE >51%) for each state and territory, for adult and child results.

An example in the use of these tables is as follows. Consider an annual estimate of 18,000 for Queensland from the adult sample. This estimate is in the range 4,800 to 19,200 and thus should be used with caution.

Table 13. Reliability rules for annual adult estimates (2020-21)

	Broadly reliable (RMOE less than 50%, RSE less than 25%)	Use with caution (RMOE between 50% and 100%, RSE between 25% and 50%)	Not reliable for general use (RMOE greater than 100%, RSE greater than 50%)
NSW	Greater than 17,600	Between 4,400 and 17,600	Less than 4,400
Vic	Greater than 18,700	Between 4,700 and 18,700	Less than 4,700
Qld	Greater than 20,300	Between 5,100 and 20,300	Less than 5,100
SA	Greater than 18,500	Between 4,600 and 18,500	Less than 4,600
WA	Greater than 19,000	Between 4,800 and 19,000	Less than 4,800
Tas	Greater than 16,800	Between 4,200 and 16,800	Less than 4,200
NT	Greater than 20,000	Between 5,000 and 20,000	Less than 5,000
ACT	Greater than 11,100	Between 2,800 and 11,100	Less than 2,800
Australia	Greater than 18,600	Between 4,600 and 18,600	Less than 4,600

Table 14. Reliability rules for annual child estimates (2020-21)

	Broadly reliable (RMOE less than 50%, RSE less than 25%)	Use with caution (RMOE between 50% and 100%, RSE between 25% and 50%)	Not reliable for general use (RMOE greater than 100%, RSE greater than 50%)
NSW	Greater than 29,700	Between 7,400 and 29,700	Less than 7,400
Vic	Greater than 32,000	Between 8,000 and 32,000	Less than 8,000
Qld	Greater than 36,000	Between 9,000 and 36,000	Less than 9,000
SA	Greater than 37,900	Between 9,500 and 37,900	Less than 9,500
WA	Greater than 34,000	Between 8,500 and 34,000	Less than 8,500
Tas	Greater than 26,600	Between 6,700 and 26,600	Less than 6,700
NT	Greater than 32,500	Between 8,100 and 32,500	Less than 8,100
ACT	Greater than 17,300	Between 4,300 and 17,300	Less than 4,300
Australia	Greater than 32,300	Between 8,100 and 32,300	Less than 8,100

5.4 MARGINS OF ERROR OF PROPORTIONS

The above margin of error tables set out the margins of error for estimates of total (e.g. 200,000 adults play golf). These tables may also be used to calculate the margins of error of estimates of proportions (e.g. 10% of adults play golf). To calculate the margins of error of survey proportions the steps needed to be taken are shown by means of an (imaginary) example.

Consider an annual AusPlay estimate for which 10% of adults in a particular category in NSW play golf. The following steps should be used to calculate the relative margin of error and 95% confidence interval for this estimate:

1. Determine the annual numerator and denominator values which give rise to the estimate of proportion. For example, if there are an estimated 200,000 NSW adults in the category of interest and of those 20,000, (10%) play golf.
2. Use the adult annual tables for relative margin of error to determine the relative margins of error of the numerator and denominator totals. From table 10 above it can be seen that the relative margin of error of the numerator (20,000) is 47.0% and for the denominator (200,000) is 14.8%.
3. The relative margin of error of the proportion (10%) is calculated by firstly squaring the relative margin of error of the numerator ($47.0\%^2 = 0.2209$) and the denominator ($14.8\%^2 = 0.0219$) and subtracting the squared relative margin of error of the denominator from that of the numerator ($0.2209 - 0.0219$), giving the value of 0.198996.
4. Finally, the relative margin of error of estimate of proportion (10%) is the square root of the final figure obtained (0.198996) which is 0.446 or 44.6%. This value is the *relative* margin of error of the estimate of 10%. The margin of error of the estimate of 10% is then $44.6\% \times 10\% = 4.6\%$ (since the margin of error is the relative margin of error multiplied by the estimate).
5. From the above we can then conclude that the 95% confidence interval for the estimate of 10% is $10\% \pm 4.6\% = (5.4\% - 14.6\%)$.