



# AUSPLAY: METHODOLOGY REPORT 2022-23

Covering the data collection period July 1, 2022 to June 10, 2023

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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. Big Village (formerly ENGINE/ORC International) 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 seventh 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, 2022 to June 10, 2023.

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 2022/23 was 20,000 (aged 15+), spread equally across the year. The sample size achieved was 16,927 (Persons 15+), with a corresponding achieved child sample size of 3,081. 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 (aged under 15 years) 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 Big Village’s dedicated CATI facility in Melbourne as well as remotely from interviewers’ own home. 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, 2022 to June 10, 2023. In this period a total of 16,927 interviews were conducted amongst adults aged 15 years and over. Of these respondents 3,081 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.

All interviewing (whether centralised or remote) was carried out in compliance with ISO 20252 and membership requirements for the Australian Data and Insights Association (formerly the 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 (2022-23)**

State	Adult sample	Child sample
NSW	5,292	937
Vic	4,469	808
Qld	3,200	638
SA	1,162	168
WA	1,735	329
Tas	423	62
NT	153	30
ACT	493	109
<b>Total</b>	<b>16,927</b>	<b>3,081</b>

The 2022-23 adult sample size of 16,927 was 15.5% less than the 2021-22 adult sample size of 20,025. This means that the measures of sample error for adult estimates, as set out in Section 5 of this report, are on average 9% higher than they were for 2021-22.

The 2022-23 child sample size of 3,081 was 11.2% less than the 2021-22 child sample size of 3,468. This means that the measures of sample error for child estimates, as set out in Section 5 of this report, are on average 6% higher than they were for 2021-22.

## 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 (2022-23)**

<b>AAPOR Response Rate: July 1, 2022 - June 10, 2023</b>			
	No answer	1,872	
	Answering machine	52,617	
	Engaged	544	
	Other non-contact	0	
<b>A</b>	<b>Total Contact Not Made - Eligibility Unknown</b>		<b>55,033</b>
	Disconnected / Invalid number - phone not connected	3,798	
	Business number/paging service	1	
	Incoming call restriction (blocks)	8	
	Fax / 'Killed'	3,861	
<b>B</b>	<b>Total Contact Not Made - Not Eligible</b>		<b>7,668</b>
<b>1) Total contact not made (A+B)</b>			<b>62,701</b>
	Call back or appointment scheduled	481	
	Total language barrier	5,649	
	Refused - non-specified	43	
	Refused- Eligibility Unknown	141,080	
<b>C</b>	<b>Total Contact Made - Eligibility Unknown</b>		<b>147,253</b>
	Out of scope - Aged under 15	290	
	Out of scope - residency status	400	
	Refused - Age question	44	
	Refused - residency status	36	
<b>D</b>	<b>Total Contact Made - Not eligible (out-of-scope)</b>		<b>770</b>
<b>E</b>	<b>Contact made - Eligible (completed interviews)</b>		<b>16,927</b>
	Respondent terminates at QRES1a or later	136	
	Not proceeding for other reason	0	
	Refused - Eligible	10,907	
	Refused- parent refused for 15-17yo	94	
	Total incapable	923	
<b>F</b>	<b>Total Contact made - Eligible (non-complete)</b>		<b>12,060</b>
<b>2) Total contact made (C+D+E+F)</b>			<b>177,010</b>
<b>Total finalised outcomes (1+2)</b>			<b>239,711</b>
<b>G</b>	Eligibility rate $[(E + F) / (D + E + F)] \%$		<b>97%</b>
<b>H</b>	Expected eligible from unknown $[G \times (A + C)]$		<b>197,052</b>
<b>J</b>	Total estimated eligible $[E + F + H]$		<b>226,039</b>
<b>RR</b>	<b>Response Rate</b> $[(E / J) \%$		<b>7%</b>

## 4 Weighting

Weights were calculated for each of the four quarterly sets of data for 2022-23. The weighting process was carried out as follows:

### 4.1 Weights for the adult sample

Weighting cells were defined by part-of-state x sex 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 sex 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 sex 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 sex 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 being proportional to 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.

Preliminary weights were then calculated by calibrating the initial weights so that the sum of weights for each collapsed weighting cell equalled the ERP value for that cell.

The final adult weights were then calculated by an iterative rim-weighting process using two ABS ERP rim values: (1) the quarterly ERP values by fine age groups up to 80+ (15-17, 18-19, 20-24, 25-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, 60-64, 65-69, 70-74, 75-79, 80+) x sex at the national level; and (2) the ERP values for the collapsed weighting cells which were used to calculate the preliminary weights.

From the start of AusPlay in 2015, the Sex variable used for weighting had been solely based on Qx (Interviewer recorded sex). However, for the 2022-23 survey the Sex variable used for weighting was based on a combination of a new question QSEX2 (Sex at birth) and Qx (Interviewer recorded sex).

The rule for assigning the category of Sex for weighting was to use the QSEX2 (Sex at birth) category for records for which those categories were either Male or Female. For other records, for which Sex at birth was neither Male nor Female, Qx (Interviewer recorded sex) was used to define Sex for weighting. This rule is set out in the table below.

**Table 5. Rules for defining sex for weighting (2022-23)**

QSEX2 (Sex at birth)	Qx (Interviewer recorded)	Sex for weighting
Male	Male	Male
Male	Female	Male
Female	Male	Female
Female	Female	Female
Neither Male nor Female	Male	Male
Neither Male nor Female	Female	Female

The table below shows the sample sizes for each of the relevant categories for 2022-23.

**Table 6. Sample sizes for the rules for defining sex for weighting (2022-23)**

QSEX2 (Sex at birth)	Qx (Interviewer recorded)	Sex for weighting	2022-23
Male	Male	Male	8,897
Male	Female	Male	71
Female	Male	Female	87
Female	Female	Female	7,155
Neither Male nor Female	Male	Male	444
Neither Male nor Female	Female	Female	273
<b>TOTAL</b>			<b>16,927</b>

## 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 an iterative 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 sex 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.

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 Big Village 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  $100,000 \pm (1.96 \times 10,000) = 100,000 \pm 19,600 = (80,400 - 119,600)$ .

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 17,300 (rounded to the nearest hundred). This means the 95% confidence interval for the survey result is  $200,000 \pm 1.96 \times 17,300 = 200,000 \pm 33,900 = (166,100 - 233,900)$ .

**Table 7. Standard errors of annual adult estimates (2022-23)**

Size of estimate	NSW (no.)	Vic (no.)	Qld (no.)	SA (no.)	WA (no.)	Tas (no.)	NT (no.)	ACT (no.)	Australia (no.)
2,000	1,700	1,700	1,800	1,700	1,700	1,500	1,800	1,300	1,700
5,000	2,700	2,700	2,800	2,700	2,700	2,400	2,800	2,100	2,700
10,000	3,900	3,800	4,000	3,800	3,900	3,400	3,900	3,000	3,900
20,000	5,500	5,400	5,600	5,400	5,500	4,900	5,600	4,200	5,500
50,000	8,700	8,500	8,900	8,500	8,600	7,700	8,800	6,600	8,600
100,000	12,300	12,100	12,600	12,100	12,200	10,900	12,500	9,300	12,200
200,000	17,300	17,100	17,800	17,100	17,300	15,400	17,600	13,200	17,300
500,000	27,400	27,000	28,100	27,000	27,300	-	-	-	27,300
800,000	34,700	34,100	35,500	34,100	34,500	-	-	-	34,500
1,000,000	38,800	38,200	39,700	38,200	38,600	-	-	-	38,600
1,500,000	47,500	46,800	48,600	-	47,300	-	-	-	47,300
2,000,000	54,800	54,000	56,200	-	54,600	-	-	-	54,600
5,000,000	86,700	85,400	-	-	-	-	-	-	86,300
8,000,000	-	-	-	-	-	-	-	-	109,100

**Table 8. Relative standard errors of annual adult estimates (2022-23)**

Size of estimate	NSW (%)	Vic (%)	Qld (%)	SA (%)	WA (%)	Tas (%)	NT (%)	ACT (%)	Australia (%)
2,000	85.0%	85.0%	90.0%	85.0%	85.0%	75.0%	90.0%	65.0%	85.0%
5,000	54.0%	54.0%	56.0%	54.0%	54.0%	48.0%	56.0%	42.0%	54.0%
10,000	39.0%	38.0%	40.0%	38.0%	39.0%	34.0%	39.0%	30.0%	39.0%
20,000	27.5%	27.0%	28.0%	27.0%	27.5%	24.5%	28.0%	21.0%	27.5%
50,000	17.4%	17.0%	17.8%	17.0%	17.2%	15.4%	17.6%	13.2%	17.2%
100,000	12.3%	12.1%	12.6%	12.1%	12.2%	10.9%	12.5%	9.3%	12.2%
200,000	8.7%	8.6%	8.9%	8.6%	8.7%	7.7%	8.8%	6.6%	8.7%
500,000	5.5%	5.4%	5.6%	5.4%	5.5%	-	-	-	5.5%
800,000	4.3%	4.3%	4.4%	4.3%	4.3%	-	-	-	4.3%
1,000,000	3.9%	3.8%	4.0%	3.8%	3.9%	-	-	-	3.9%
1,500,000	3.2%	3.1%	3.2%	-	3.2%	-	-	-	3.2%
2,000,000	2.7%	2.7%	2.8%	-	2.7%	-	-	-	2.7%
5,000,000	1.7%	1.7%	-	-	-	-	-	-	1.7%
8,000,000	-	-	-	-	-	-	-	-	1.4%

**Table 9. Standard errors of annual child estimates (2022-23)**

Size of estimate	NSW (no.)	Vic (no.)	Qld (no.)	SA (no.)	WA (no.)	Tas (no.)	NT (no.)	ACT (no.)	Australia (no.)
5,000	3,600	3,400	3,500	3,700	3,500	3,300	3,900	2,500	3,500
10,000	5,100	4,900	5,000	5,200	5,000	4,600	5,600	3,500	5,000
20,000	7,200	6,900	7,000	7,400	7,100	6,500	7,900	4,900	7,100
50,000	11,400	10,800	11,100	11,700	11,200	10,300	12,500	7,800	11,200
100,000	16,100	15,300	15,700	16,500	15,800	-	-	-	15,800
200,000	22,700	21,700	22,300	23,300	22,300	-	-	-	22,300
500,000	36,000	34,300	35,200	-	35,300	-	-	-	35,300
800,000	45,500	43,400	44,500	-	-	-	-	-	44,700
1,000,000	50,800	48,500	49,800	-	-	-	-	-	49,900
1,500,000	62,300	-	-	-	-	-	-	-	61,200
2,000,000	-	-	-	-	-	-	-	-	70,600

**Table 10. Relative standard error of annual child estimates (2022-23)**

Size of estimate	NSW (%)	Vic (%)	Qld (%)	SA (%)	WA (%)	Tas (%)	NT (%)	ACT (%)	Australia (%)
5,000	72.0%	68.0%	70.0%	74.0%	70.0%	66.0%	78.0%	50.0%	70.0%
10,000	51.0%	49.0%	50.0%	52.0%	50.0%	46.0%	56.0%	35.0%	50.0%
20,000	36.0%	34.5%	35.0%	37.0%	35.5%	32.5%	39.5%	24.5%	35.5%
50,000	22.8%	21.6%	22.2%	23.4%	22.4%	20.6%	25.0%	15.6%	22.4%
100,000	16.1%	15.3%	15.7%	16.5%	15.8%	-	-	-	15.8%
200,000	11.4%	10.9%	11.2%	11.7%	11.2%	-	-	-	11.2%
500,000	7.2%	6.9%	7.0%	-	7.1%	-	-	-	7.1%
800,000	5.7%	5.4%	5.6%	-	-	-	-	-	5.6%
1,000,000	5.1%	4.9%	5.0%	-	-	-	-	-	5.0%
1,500,000	4.2%	-	-	-	-	-	-	-	4.1%
2,000,000	-	-	-	-	-	-	-	-	3.5%

## 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 33,900. This means the 95% confidence interval for the survey result is 200,000 +/- 33,900 = (166,100 - 233,900). This is the same 95% confidence interval that was calculated in the same example above, using the standard error tables.

**Table 11. Margins of error of annual adult estimates (2022-23)**

Size of estimate	NSW (no.)	Vic (no.)	Qld (no.)	SA (no.)	WA (no.)	Tas (no.)	NT (no.)	ACT (no.)	Australia (no.)
2,000	3,300	3,300	3,500	3,300	3,300	2,900	3,500	2,500	3,300
5,000	5,300	5,300	5,500	5,300	5,300	4,700	5,500	4,100	5,300
10,000	7,600	7,400	7,800	7,400	7,600	6,700	7,600	5,900	7,600
20,000	10,800	10,600	11,000	10,600	10,800	9,600	11,000	8,200	10,800
50,000	17,100	16,700	17,400	16,700	16,900	15,100	17,200	12,900	16,900
100,000	24,100	23,700	24,700	23,700	23,900	21,400	24,500	18,200	23,900
200,000	33,900	33,500	34,900	33,500	33,900	30,200	34,500	25,900	33,900
500,000	53,700	52,900	55,100	52,900	53,500	-	-	-	53,500
800,000	68,000	66,800	69,600	66,800	67,600	-	-	-	67,600
1,000,000	76,000	74,900	77,800	74,900	75,700	-	-	-	75,700
1,500,000	93,100	91,700	95,300	-	92,700	-	-	-	92,700
2,000,000	107,400	105,800	110,200	-	107,000	-	-	-	107,000
5,000,000	169,900	167,400	-	-	-	-	-	-	169,100
8,000,000	-	-	-	-	-	-	-	-	213,800

**Table 12. Relative margins of error of annual adult estimates (2022-23)**

Size of estimate	NSW (%)	Vic (%)	Qld (%)	SA (%)	WA (%)	Tas (%)	NT (%)	ACT (%)	Australia (%)
2,000	165.0%	165.0%	175.0%	165.0%	165.0%	145.0%	175.0%	125.0%	165.0%
5,000	106.0%	106.0%	110.0%	106.0%	106.0%	94.0%	110.0%	82.0%	106.0%
10,000	76.0%	74.0%	78.0%	74.0%	76.0%	67.0%	76.0%	59.0%	76.0%
20,000	54.0%	53.0%	55.0%	53.0%	54.0%	48.0%	55.0%	41.0%	54.0%
50,000	34.2%	33.4%	34.8%	33.4%	33.8%	30.2%	34.4%	25.8%	33.8%
100,000	24.1%	23.7%	24.7%	23.7%	23.9%	21.4%	24.5%	18.2%	23.9%
200,000	17.0%	16.8%	17.5%	16.8%	17.0%	15.1%	17.3%	13.0%	17.0%
500,000	10.7%	10.6%	11.0%	10.6%	10.7%	-	-	-	10.7%
800,000	8.5%	8.4%	8.7%	8.4%	8.5%	-	-	-	8.5%
1,000,000	7.6%	7.5%	7.8%	7.5%	7.6%	-	-	-	7.6%
1,500,000	6.2%	6.1%	6.4%	-	6.2%	-	-	-	6.2%
2,000,000	5.4%	5.3%	5.5%	-	5.4%	-	-	-	5.4%
5,000,000	3.4%	3.3%	-	-	-	-	-	-	3.4%
8,000,000	-	-	-	-	-	-	-	-	2.7%

**Table 13. Margins of error of annual child estimates (2022-23)**

Size of estimate	NSW (no.)	Vic (no.)	Qld (no.)	SA (no.)	WA (no.)	Tas (no.)	NT (no.)	ACT (no.)	Australia (no.)
5,000	7,100	6,700	6,900	7,300	6,900	6,500	7,600	4,900	6,900
10,000	10,000	9,600	9,800	10,200	9,800	9,000	11,000	6,900	9,800
20,000	14,100	13,500	13,700	14,500	13,900	12,700	15,500	9,600	13,900
50,000	22,300	21,200	21,800	22,900	22,000	20,200	24,500	15,300	22,000
100,000	31,600	30,000	30,800	32,300	31,000	-	-	-	31,000
200,000	44,500	42,500	43,700	45,700	43,700	-	-	-	43,700
500,000	70,600	67,200	69,000	-	69,200	-	-	-	69,200
800,000	89,200	85,100	87,200	-	-	-	-	-	87,600
1,000,000	99,600	95,100	97,600	-	-	-	-	-	97,800
1,500,000	122,100	-	-	-	-	-	-	-	120,000
2,000,000	-	-	-	-	-	-	-	-	138,400

**Table 14. Relative margins of error of annual child estimates (2022-23)**

Size of estimate	NSW (%)	Vic (%)	Qld (%)	SA (%)	WA (%)	Tas (%)	NT (%)	ACT (%)	Australia (%)
5,000	142.0%	134.0%	138.0%	146.0%	138.0%	130.0%	152.0%	98.0%	138.0%
10,000	100.0%	96.0%	98.0%	102.0%	98.0%	90.0%	110.0%	69.0%	98.0%
20,000	70.5%	67.5%	68.5%	72.5%	69.5%	63.5%	77.5%	48.0%	69.5%
50,000	44.6%	42.4%	43.6%	45.8%	44.0%	40.4%	49.0%	30.6%	44.0%
100,000	31.6%	30.0%	30.8%	32.3%	31.0%	-	-	-	31.0%
200,000	22.3%	21.3%	21.9%	22.9%	21.9%	-	-	-	21.9%
500,000	14.1%	13.4%	13.8%	-	13.8%	-	-	-	13.8%
800,000	11.2%	10.6%	10.9%	-	-	-	-	-	11.0%
1,000,000	10.0%	9.5%	9.8%	-	-	-	-	-	9.8%
1,500,000	8.1%	-	-	-	-	-	-	-	8.0%
2,000,000	-	-	-	-	-	-	-	-	6.9%

## 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 apply 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 6,100 to 24,200 and thus should be used with caution.

**Table 15. Reliability rules for annual adult estimates (2022-23)**

	<b>Broadly reliable</b> <i>(RMOE less than 50%, RSE less than 25%)</i>	<b>Use with caution</b> <i>(RMOE between 50% and 100%, RSE between 25% and 50%)</i>	<b>Not reliable for general use</b> <i>(RMOE greater than 100%, RSE greater than 50%)</i>
NSW	Greater than 23,100	Between 5,800 and 23,100	Less than 5,800
Vic	Greater than 22,400	Between 5,600 and 22,400	Less than 5,600
Qld	Greater than 24,200	Between 6,100 and 24,200	Less than 6,100
SA	Greater than 22,400	Between 5,600 and 22,400	Less than 5,600
WA	Greater than 22,900	Between 5,700 and 22,900	Less than 5,700
Tas	Greater than 18,200	Between 4,600 and 18,200	Less than 4,600
NT	Greater than 23,900	Between 6,000 and 23,900	Less than 6,000
ACT	Greater than 13,400	Between 3,400 and 13,400	Less than 3,400
Australia	Greater than 22,900	Between 5,700 and 22,900	Less than 5,700

**Table 16. Reliability rules for annual child estimates (2022-23)**

	<b>Broadly reliable</b> <i>(RMOE less than 50%, RSE less than 25%)</i>	<b>Use with caution</b> <i>(RMOE between 50% and 100%, RSE between 25% and 50%)</i>	<b>Not reliable for general use</b> <i>(RMOE greater than 100%, RSE greater than 50%)</i>
NSW	Greater than 39,700	Between 9,900 and 39,700	Less than 9,900
Vic	Greater than 36,200	Between 9,000 and 36,200	Less than 9,000
Qld	Greater than 38,100	Between 9,500 and 38,100	Less than 9,500
SA	Greater than 41,800	Between 10,400 and 41,800	Less than 10,400
WA	Greater than 38,300	Between 9,600 and 38,300	Less than 9,600
Tas	Greater than 32,600	Between 8,200 and 32,600	Less than 8,200
NT	Greater than 47,700	Between 11,900 and 47,700	Less than 11,900
ACT	Greater than 18,500	Between 4,600 and 18,500	Less than 4,600
Australia	Greater than 38,300	Between 9,600 and 38,300	Less than 9,600



## 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 12 above it can be seen that the relative margin of error of the numerator (20,000) is 54.0% and for the denominator (200,000) is 17.0%.
3. The relative margin of error of the proportion (10%) is calculated by firstly squaring the relative margin of error of the numerator ( $54.0\%^2 = 0.2916$ ) and the denominator ( $17.0\%^2 = 0.0289$ ) and subtracting the squared relative margin of error of the denominator from that of the numerator ( $0.2916 - 0.0289$ ), giving the value of 0.2627.
4. Finally, the relative margin of error of estimate of proportion (10%) is the square root of the final figure obtained (0.2627) which is 0.513 or 51.3%. This value is the relative margin of error of the estimate of 10%. The margin of error of the estimate of 10% is then  $51.3\% \times 10\% = 5.1\%$  (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  $10\% \pm 5.1\% = (4.9\% - 15.1\%)$ .