

ARIA Scores: Index of accessibility/remoteness

Age Cohorts	Younger, Mid-age and Older
Surveys	Survey 2
Derived Variables	ARIA & ARIAPlus
Definition	Index of accessibility/remoteness based on the distance to the nearest service centre.
Source Items	Address at Survey 2
Statistical Form	Categorical variable
Index Number	DEM-071 & DEMO-073
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Abbreviations

ABS	Australian Bureau of Statistics
ARIA	Accessibility/Remoteness Index of Australia
ARIA+	ARIAPlus
ASGC	Australian Standard Geographical Classification
GISCA	National Key Centre for Social Applications of Geographic Information Systems
GPO	General Post Office

Background

The following text is a summary of the reference materials only. Some sections are taken directly from these references.

ARIA¹

ARIA was developed by GISCA as a measure of remoteness based on road distances to service centres. Road distances are calculated for all places in Australia and scores are available for various geographic units (such as Census collector's district, statistical local area and postcode). Addresses from Survey 1 of the ALSWH were coded to ARIA and have been reported previously (Report 14, 10 June 2000, ALSWH).

Scores range from 0 to 12 and define 5 categories of remoteness:

ARIA score	Category - Description
0 - 1.84	Highly accessible <i>Relatively unrestricted accessibility to a wide range of goods and services and opportunities for social interaction</i>
>1.84 - 3.51	Accessible <i>Some restrictions to accessibility of some goods, services and opportunities for social interaction</i>
>3.51 - 5.80	Moderately accessible <i>Significantly restricted accessibility of goods, services and opportunities for social interaction</i>
>5.80 - 9.08	Remote <i>Very restricted accessibility of goods, services and opportunities for social interaction</i>
>9.08 – 12	Very Remote <i>Locationally disadvantaged - very little accessibility of goods, services and opportunities for social interaction</i>

ARIA+

In 2003, GISCA released a new version of its ARIA, called ARIA+.² ARIA+ has been chosen by the ABS to be the basis of the remoteness categories included in the 2001 Australian Standard Geographical Classification. Scores range from 0 to 15 and the ABS has defined 5 categories for remoteness¹:

ARIA+ score	Category
0 – 0.20	Major cities of Australia
>0.20 – 2.40	Inner regional Australia
>2.40 - 5.92	Outer regional Australia
>5.92 – 10.53	Remote Australia
>10.53	Very remote Australia

Although it is anticipated that ARIA+ will supersede the ARIA index as the standard measure of remoteness, the fact that ARIA is still widely used means that for some purposes the index will still need to be calculated.²

Differences between ARIA and ARIA+²

The major difference between ARIA and ARIA+ is the inclusion of a fifth service centre category, resulting in an index ranging from 0-15 rather than 0-12 as in ARIA. The fifth service centre category includes all urban centres with population of greater than 1,000 and less than 5,000 people. The additional class was included in response to a need by some users to analyse smaller service centres than those included in the original ARIA index. The inclusion of the fifth service class in ARIA+ results in a slightly more detailed representation of remoteness across Australia. The finer differentiation of remoteness categorisation is useful for those applications where ARIA was previously considered too broad.

ARIA+ increases the distance weighting of Tasmanian localities from 500km to 763 km. This distance is estimated to more accurately indicate the additional cost of travelling from Tasmania to the mainland. The overall effect of this change is to increase the remoteness score of Tasmanian localities.

ARIA+ models accessibility at the urban fringe more effectively by reducing the estimated distance to the nearest service centre. In ARIA, the distance was measured from each town to the GPO of the nearest service centre. In ARIA+, distance is measured instead from each town to the edge of the built-up area of the nearest service centre, as defined by the ABS Urban Centre and Locality boundary. The greatest impact of this change is for towns with service centres such as Sydney, where the edge of the built up area is found some distance from the GPO.

Derived Variables²

ARIA scores for Survey 2 data from the ALSWH were assigned by GISCA according to the November 2002 Revision of ARIA coding. This version of ARIA incorporates some features of ARIA+, such as the 763km distance weighting for Tasmanian localities and the use of the edge of the urban centre rather than the GPO to calculate distance to an urban centre. In fact, the only difference between this version of ARIA and the ARIA+ index is that ARIA+ measures distance to 5 levels of service centre rather than four. The implementation of these measures is viewed as a marked improvement over the previous methodology.

Accordingly, ARIA scores for surveys 1 and 2 should not be compared with one another, nor should differences in scores between surveys 1 and 2 be calculated.

ARIA+ scores were assigned by GISCA to Survey 2 data according to the 2001 version of the ASGC.

Missing Values

ARIA and ARIA+ scores are missing for records which could not be geo-coded and for records with addresses which are 'VIA' another locality.

The distribution of ARIA and ARIA+ scores among the three age-cohorts of the ALSWH are shown in Table 1.

Table 1 ARIA and ARIA+ Scores at Survey 2

	Younger		Mid-age		Older	
	Number	Percent	Number	Percent	Number	Percent
ARIA Category						
Highly accessible	7 458	77.3	8 245	67.2	7 673	73.6
Accessible	1 424	14.8	2 568	20.9	1 943	18.7
Moderately accessible	511	5.3	923	7.5	631	6.1
Remote	171	1.8	388	3.2	131	1.3
Very remote	83	1.9	151	1.2	43	0.4
ARIA+ Category						
Major cities	4 950	51.3	4 082	33.3	4 041	38.8
Inner regional	2 961	30.7	4 960	40.4	4 285	41.1
Outer regional	1 445	15.0	2 611	21.3	1 858	17.8
Remote	224	2.3	491	4.0	200	1.9
Very remote	67	0.7	131	1.1	37	0.4
Total Categorised	9 647	100.1	12 275	100.0	10 421	100.1
Missing	38	0.4	63	0.5	0	0.0

References

1. Department of Health and Aged Care (GISCA). *Measuring remoteness: accessibility/remoteness index of Australia (ARIA)*. Revised Ed. Occasional Paper New Series No. 14. 2001; Department of Health and Aged Care, Canberra
2. Edited from '*Documentation and Notes: Younger & Middle Cohorts Geo-coding November 2002*'. Rachel Ambagtsheer for National Centre for Social Applications of Geographic Information Systems.