

APPENDIX A: Frequently Asked Questions

1. What is ARIA?

ARIA stands for Accessibility/Remoteness Index of Australia. During 1998, the Commonwealth Department of Health and Aged Care commissioned a project to measure and classify the remoteness of populated localities in relation to 'service centres' of various sizes (based on the 1996 Census). The result was the ARIA index developed by the National Key Centre for Social Applications of Geographical Information Systems (GISCA) at the University of Adelaide.

ARIA uses Geographic Information System (GIS) technology to provide a measure of remoteness (from service centres) for all places and points in Australia.

ARIA defines **five categories** of remoteness based on road distance to service centres, and is available for a variety of geographical units including localities, Census Collection districts (CCDs), Statistical Local Areas (SLAs) and postcodes.

The five categories are:

1. **Highly Accessible** (ARIA score 0 - 1.84) - relatively unrestricted accessibility to a wide range of goods and services and opportunities for social interaction
2. **Accessible** (ARIA score >1.84 - 3.51) - some restrictions to accessibility of some goods, services and opportunities for social interaction
3. **Moderately Accessible** (ARIA score >3.51 - 5.80) - significantly restricted accessibility of goods, services and opportunities for social interaction
4. **Remote** (ARIA score >5.80 - 9.08) - very restricted accessibility of goods, services and opportunities for social interaction
5. **Very Remote** (ARIA score >9.08 - 12) - very little accessibility of goods, services and opportunities for social interaction

2. How does ARIA interpret remoteness & accessibility?

ARIA interprets remoteness as accessibility to service centres that had a population greater than 5,000 in the 1996 Census. Remoteness values for all of the 11,340 populated localities are derived from the road distance to service centres in four categories.

Using the methodology outlined in greater detail in the source paper, an ARIA index score between 0 and 12 was calculated for each populated locality. A zero value means that the location has the highest level of access to services while a value of 12 indicates the location has the lowest level of access to services (and correspondingly the highest measure of remoteness from services).

Values for populated localities are interpolated to a 1-km grid, which can then be used as the building blocks to provide average ARIA values for any geographic area.

3. What are the major benefits of the ARIA classification?

The ARIA classification provides a simple, transparent and readily extendible methodology for the classification of accessibility and remoteness. The development of the GPARIA for the administration of the GP rural retention program provides an example of this flexibility. For GPARIA, a number of additional variables have been added to the general basket of services to better target areas requiring retention payments.

ARIA currently measures only geographic accessibility. However, it is possible to build additional layers (perhaps similar to the Social Economic Index for Areas (SEIFA) compiled by the ABS) to provide a more complex measure that incorporates socio-economic and demographic aspects of remoteness.

ARIA has achieved a high level of acceptance by a broad range of users. The ABS have incorporated a variation of ARIA into the 2001 edition of the ASGC, and this will be used for the 2001 Population Census and any other ABS data that contains a measure of remoteness.

ARIA has a number of advantages compared with RRMA:

- ARIA is flexible. It can be used to generate a remoteness score for any existing statistical, administrative or user-defined boundary area. The RRMA classification only exists at the SLA level.
- ARIA is conceptually simple. It measures remoteness only in geographic terms, whereas RRMA combines a distance measure with a population density measure.
- ARIA is a more precise measure. ARIA uses the point location of towns and measures distances by road, whereas RRMA measures straight-line distance from the centroid of SLAs.
- ARIA is relatively stable over time. ARIA remoteness values will only change over time when population centres change significantly and move into a different service centre category. RRMA will also be affected by changes in population density.

4. Are there any problems with ARIA?

The most common issue raised by users is that ARIA does not provide a definition for 'rural' Australia, whereas RRMA does.

There is neither a generally accepted nor generally applicable definition that can be used to identify rural areas. Consequently, it was decided that ARIA would not include a definition of rural areas. The Department, by using ARIA in preference to RRMA, has decided that the degree of geographic remoteness of an area is a better indicator of disadvantage than subjective labels such as 'rural'. Other measures can also be used to measure disadvantage such as SEIFA (Socio-Economic Indexes For Areas).

RRMA categories are often used as a measure of rurality for allocating resources simply because they contain the word rural in the category name. However the term 'rural' as used in RRMA was not intended to constitute a definition of rurality. It is used to simply indicate a lesser degree of remoteness than areas in the 'remote' category of RRMA.

5. What is the Department's official position on the use of ARIA?

ARIA supersedes the RRMA classification and is considered to be a superior approach to measuring remoteness. It has been adopted as the Department's official approach to measuring remoteness and has been widely adopted as a national standard. The ABS will incorporate remoteness categories based on ARIA into the 2001 edition of the ASGC and these remoteness categories will be used to produce output from the 2001 Census.

6. Who is using ARIA?

Within the Department of Health and Aged Care, various different program areas that deliver services or assistance to regional, rural or remote areas are moving to the use of ARIA. However, this process can take time to implement and can be subject to legislative constraints, the need to obtain the agreement of other stakeholders, or practical issues such as the need to ensure consistency of treatment with existing approaches.

A number of government agencies that need to assess the difficulties facing Australians living in non-metropolitan areas in accessing services are also using ARIA. ARIA provides a more objective indicator of remoteness and the targeting of assistance, than do (more subjective) alternatives.

7. How often will ARIA be updated?

The design of the ARIA index ensures that it is relatively stable over time. In theory ARIA scores will only change when there are changes to the list of Service Centres, or when new road network information is used.

The population of Service Centres can only be accurately determined using Population Census data at the Collection District level. After Census information is released the effect of population changes over the 5 year period since the previous Census will be known. Due to natural increase and shifts in population between regions, there will be some situations where a Service Centre grows or declines in population size between each Census so that it moves into a different Service Centre category. Such cases are expected to be relatively infrequent and will only have a small effect on the overall ARIA index.

Following the release of 2001 Population Census data at the Collection District level, the effect of population change on Service Centres will be analysed. If this work shows significant changes to the list of Service Centres, then consideration will be given to revising the ARIA index. A revised ARIA index would be available around the end of 2003.

Significant change to Australia's road network also has the potential to change ARIA values. Consideration will be given to recalculating road distances from populated localities to Service Centres whenever service centre populations are recalculated.

8. What are the differences between RRMA and ARIA?

ARIA is based on road distances to service centres of varying sizes - a more accurate measure than RRMA, which calculated simple straight-line distances from the centroid (mid-point) of a SLA to a service centre.

ARIA allows remoteness to be calculated for any level of geography (towns, postcodes, SLAs, user defined areas, etc) whereas the RRMA approach only measured remoteness at the SLA level.

ARIA is an unambiguous geographic approach to measuring remoteness whereas RRMA attempted to combine a geographic approach with a measure of population density.

9. Why are some areas classified as 'rural' under RRMA making them eligible for program funding - whereas they are classified as 'highly accessible' under ARIA?

This reflects the different underlying methodology. Areas on the fringe of capital cities will tend to be classified as 'rural' under RRMA whereas they will be 'highly accessible' under ARIA. Users need to decide the appropriate treatment of areas such as Toowoomba, Albury-Wodonga, Orange-Bathurst, and Nowra. ARIA treats such areas as being highly accessible and this allows users to distinguish between them and other areas such as Mackay (ARIA score of 3.8) or Geraldton (ARIA score of 2.8) that are classified as 'large rural centres' under RRMA.

10. What is ARIA+?

"ARIA+" is a development of ARIA proposed by GISCA (the National Key Centre for Social Applications of GIS).

There are three differences in methodology between ARIA and ARIA+.

The major difference between ARIA and ARIA+ is that ARIA+ includes an extra category of Service Centres. ARIA+ is based on road distance to Service Centres in following five categories:

- A. more than 250,000 persons
- B. 48,000 – 249,000 persons
- C. 18,000 – 47,999 persons
- D. 5,000 – 17,999 persons
- E. 1,000 – 4,999 persons

This results in the ARIA+ index having a value between 0 and 15 rather than a range of 0 to 12.

There are currently 199 designated Service Centres in Categories A to D. The inclusion of the fifth category of Service Centres will lead to approximately 545 Category E Services Centres being utilised in the calculations of index scores. The increase in the number of Service Centres means that there will be more Service Centres affected by population change between each Census. As a result, there may be a stronger case to rework the ARIA+ index than to rework the ARIA index, after each Census.

The second difference in the ARIA+ methodology is that road distances are calculated from the perimeter of a Service Centre rather than the centre of the Service Centre. This has a minor effect on the index and these differences will only be apparent on the edge of physically large Service Centres such as Sydney.

The third difference is the treatment of Tasmania. In ARIA, an adjustment factor is applied to all islands, with one rule being applied to Tasmania and a separate general rule applied to all other islands. Under ARIA+, the adjustment factor applied to Tasmania has been modified so that the relative remoteness score of all of Tasmania has increased. For Hobart the ARIA+ index score is 1.84 compared with an ARIA score of 1.21 (this difference is wholly due to the different adjustment factor applied to Tasmania).

Apart from the differences in methodology, some additional populated localities were identified and used in the calculation of ARIA+ index scores. ARIA+ was calculated using 11,879 populated localities whereas ARIA used 11,340 populated localities.

Different ARIA index ranges have been proposed by GISCA for the five categories of remoteness, because ARIA+ scores cover an expanded range of values compared with ARIA. GISCA have also changed the conceptual basis for defining the highly accessible category, and have suggested that the highly accessible category should correspond to index scores between 0 and 0.20. This means that the highly accessible category covers a smaller area around the fringe of major cities.

11. How is the ABS incorporating remoteness into the ASGC?

The ABS has used ARIA+ as the basis for incorporating the concept of remoteness into the ASGC. This is likely to result in ARIA+ becoming the defacto standard approach to measuring remoteness.

The ABS released a publication on 5 July 2001 (Information Paper: ABS Views on Remoteness Consultation, Australia; Catalogue No.1244.0.00.001) that describes how the ABS will incorporate remoteness within the ASGC. In this paper the ABS discuss the strengths and weaknesses of the ARIA approach (using ARIA+) to measuring remoteness. This paper does not attempt to distinguish between ARIA and ARIA+ because this would simply complicate the basis issue of how remoteness will be incorporated into the ASGC.

The ABS has chosen its own index ranges used to define the five categories of remoteness and has also given different names to the five categories of remoteness. The main difference between ABS index ranges and the original GISCA proposed ranges is that the ABS has increased the relative size of the remote categories. The main reason for this change was to ensure that survey output would be available for remote areas. This required an increase in the size of the population defined in remote areas.

The ABS five categories of remoteness that relate to physical areas are listed below. An extra category is also defined for Census Collection Districts to cover “Migratory” areas that are defined at Census time.

1. **Major Cities of Australia** - ARIA scores between 0 and 0.20
2. **Inner Regional Australia** - ARIA scores greater than 0.20 and less than or equal to 2.40
3. **Outer Regional Australia** - ARIA scores greater than 2.40 and less than or equal to 5.92
4. **Remote Australia**- ARIA scores greater than 5.92 and less than or equal to 10.53
5. **Very Remote Australia** - ARIA scores greater than 10.53

12. How do I find more information about ARIA?

Additional information on ARIA can be found on the Departmental Web site (<http://www.health.gov.au/ari/aria.htm>) and from the Web site of the National Key Centre for Social Applications of GIS (<http://www.gisca.adelaide.edu.au>).

Users can also contact the Information Section in the Portfolio Strategies Division. All e-mails relating to ARIA can be sent to ARIA@health.gov.au.