



6.7 Spatial variation in Indigenous women's access to maternal health services

Introduction

The gap between the health of Aboriginal and Torres Straits Islander children and non-Indigenous children begins before birth, with Indigenous babies significantly more likely to have been exposed to tobacco smoke in utero, to be born pre-term, and to have a low birthweight (weighing less than 2,500 grams at birth) (AIHW 2015a). Inequalities continue throughout early childhood for Aboriginal and Torres Strait Islander children, with higher mortality rates and higher rates of illness and poor health (see 'Chapter 5.2 Trends and patterns in maternal and perinatal health' and 'Chapter 6.6 Indigenous Australians' access to health services').

The factors that contribute to poor infant and child health are complex. These factors include maternal health (for example, maternal weight, pre-existing health conditions); maternal behaviours (smoking and alcohol consumption during pregnancy, maternal nutrition and breastfeeding); maternal age; social determinants (socioeconomic position and education); and access to health services (such as antenatal care and child health services). Ensuring that Aboriginal and Torres Strait Islander families have access to high quality, evidence-based and culturally competent maternal and child health care services has been the goal of a number of state, territory and Australian Government programs and is an important policy issue.

This article highlights the findings from a series of analyses the AIHW has been undertaking which are aimed at identifying geographic areas with potential gaps in services for Aboriginal and Torres Strait Islander Australians (AIHW 2015b), by focusing on Indigenous women's spatial access to two broad types of maternal health services: birthing units within hospitals and antenatal/postnatal services.

Four types of antenatal/postnatal care services are analysed:

- those available from hospitals with a birthing unit
- those provided by Indigenous-specific primary health care services (ISPHCS)
- those available at Royal Flying Doctor Service (RFDS) clinics
- those provided by general practitioners (GPs).

Box 6.7.1 presents an overview of the methodology used to calculate spatial access to maternal health services.



Box 6.7.1: Measuring the spatial accessibility of services

The spatial accessibility of services in this report is measured as the percentage of the relevant population in an area who are within an hour's drive of a particular type of service. Thus, access is measured in terms of physical access only—although even if services are physically accessible, they may not be culturally appropriate or financially accessible or may not be able to provide services when needed due to capacity issues.

The data are presented at the SA2 level (Statistical Area Level 2), which forms part of the Australian Statistical Geography Standard, developed by the Australian Bureau of Statistics (ABS) for the collection and dissemination of geographic statistics. There are 2,214 SA2 areas, with populations between 3000 and 25,000. SA2s are contiguous and cover the entire landmass of Australia. Wherever possible, the SA2 boundaries were based on officially gazetted suburbs and localities. In urban areas SA2s largely conform to whole suburbs and combinations of whole suburbs, while in rural areas they define functional zones of social and economic links.

The percentage of the SA2 population within a one-hour drive from a particular type of service was calculated using several steps (see AIHW 2015b for detailed information on the methodology). The address for each service location was geocoded to a point location then geospatial software was used to calculate the drive time from the manually adjusted population centroid (the point location in an area that aims to represent where people live) of each SA1 (Statistical Area Level 1, the smaller geographic areas that aggregate to an SA2). These results were then used to calculate the proportions of the population within SA2s who were inside or outside a one-hour drive. Women and children living in migratory zones or unable to be classified into an SA2 were excluded from these analyses.

Where do Indigenous women and children live?

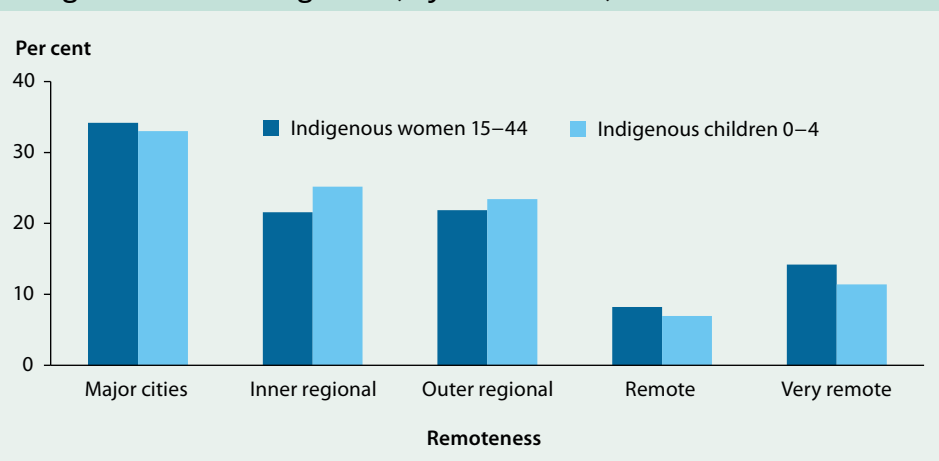
The spatial distribution of Aboriginal and Torres Strait Islander women of child-bearing age and children is a critical issue for the development and delivery of a range of maternal and child health services.

There are an estimated 124,000 Aboriginal and Torres Strait Islander women of child-bearing age in Australia (ages 15–44), and each year approximately 10% give birth (Hilder et al. 2014). There are also just over 67,000 Indigenous children under 5 years of age. Figure 6.7.1 shows that, while the highest proportions of Indigenous women and young children live in *Major cities*, over one-fifth (22%) of Indigenous women of child-bearing age live in *Remote* or *Very remote* areas, as do nearly one-fifth (18%) of Indigenous children under age 5.

This population distribution is important because distance often poses significant challenges for workforce recruitment and health service delivery in areas outside cities, particularly in areas in which populations are widely dispersed or isolated. While service availability is less of an issue in urban areas, ensuring that these services are culturally appropriate and accessible to Aboriginal and Torres Strait Islander women is essential for effective care.



Figure 6.7.1: Distribution of Indigenous women aged 15–44 and Indigenous children aged 0–4, by remoteness, 2011



Spatial distribution of hospitals with a birthing unit

Access to high quality, evidence-based and culturally competent maternity care close to where women live is one of the goals of the National Maternity Services Plan (AHMAC 2011), and is expected to help close the demonstrated gap in infant and child health outcomes between Indigenous and non-Indigenous babies and children.

The geographic supply and accessibility of hospitals offering birthing services is a critical issue for Aboriginal and Torres Strait Islander women and families, and for residents of rural and remote areas in general. In rural and remote areas where no birthing facilities are available, women assessed at normal risk of poor outcomes are often required to relocate to an urban or regional hospital location at 36–38 weeks of pregnancy. Those at higher risk—because of prior pre-term delivery, stillbirth, or baby born of low birthweight; maternal age; obesity; or because of identified medical conditions—may need to spend weeks away from home and family. Available data show that Indigenous mothers are 1.6 times as likely to be obese as non-Indigenous mothers and are also more likely to have higher rates of pre-existing hypertension and pre-existing diabetes (AIHW 2015a).

From a woman's and a family's perspectives, having to travel long distances to give birth can be costly and disruptive to life in general, as well as to continuity of care. For Aboriginal and Torres Strait Islander women, there are also additional stressors such as being separated from land and community, and the cultural impact of not giving birth on country; language barriers; isolation; fear of asking for culturally appropriate birthing options; and the need to negotiate an unfamiliar health system (Williams 2011; Wyndow & Jackiewicz 2014). The impact of these factors is that some women may go back to their communities prior to birth and require emergency medical evacuation (Williams 2011), while others delivering in hospitals far from where they live may be more likely to discharge themselves and their babies prematurely (Henry et al. 2007).



Challenges for the health system include ensuring that there is good communication among providers in the local community and the hospital at which the woman gives birth, and that postnatal follow-up care is available in the community where the mother and baby live.

In order to examine the spatial accessibility of hospitals with birthing units, the AIHW has compiled and geocoded a list of public and private hospitals in Australia with birthing units, based on publicly available information on health websites; information included in state/territory 'Mothers and babies' reports; and communication with state and territory officials. Hospitals were included only if they offered a dedicated birthing unit—they were not included if they only provided emergency delivery services.

In 2015, 27% of hospitals in Australia had dedicated birthing units in:

- 219 public hospitals (out of 746 public hospitals)
- 63 private hospitals (out of 281 private hospitals).

These include hospitals with small birthing units for women at low risk of complications, through to tertiary centres with full services for women at high risk, including neonatal services for the babies. Table 6.7.1 presents the number of hospitals, by remoteness and by whether the birthing unit is in a public or private hospital. This distinction is important, because public birthing units provide services to all women, while private birthing units offer an additional option for those with the resources to access them.

Table 6.7.1. Number of public and private hospitals with birthing units by remoteness, 2015

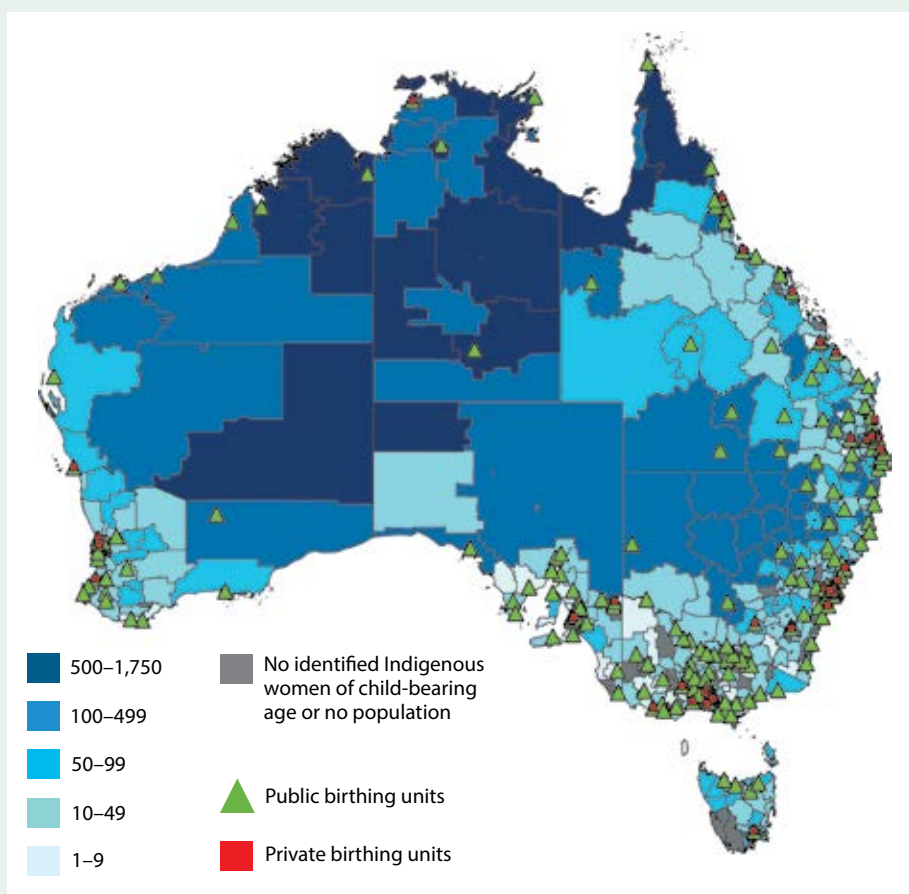
	Public hospitals with birthing units	Private hospitals with birthing units	Total hospitals with birthing units	Percent of birthing units that are public
Major cities	70	48	118	59.3
Inner regional	74	9	83	89.2
Outer regional	52	6	58	89.7
Remote	16	0	16	100.0
Very remote	7	0	7	100.0
Total	219	63	282	77.7

Nearly all (196 out of 219) public hospitals with birthing units are in *Major cities* or regional areas, although there are 16 public hospitals in *Remote* areas with birthing units, and 7 in *Very remote* areas. Private birthing facilities make up 41% of all birthing units in *Major cities*, and there are no private hospitals in *Remote* or *Very remote* areas with birthing units.

Figure 6.7.2 shows the locations of the hospitals with birthing units, contrasted against the number of Indigenous women of child-bearing age at the SA2 level. This map illustrates the concentration of hospitals with birthing units in metropolitan areas, as well as the overlap in locations of public and private birthing units in metropolitan areas. It also shows that there are a large number of SA2s with at least 100 Indigenous women of child-bearing age who appear to be far from a hospital with a birthing unit, particularly in the Northern Territory, Western Australia and northern Queensland. The next section builds on this map by calculating spatial accessibility to these units.



Figure 6.7.2: Public and private birthing units and number of Indigenous women of child-bearing age, by SA2, 2015

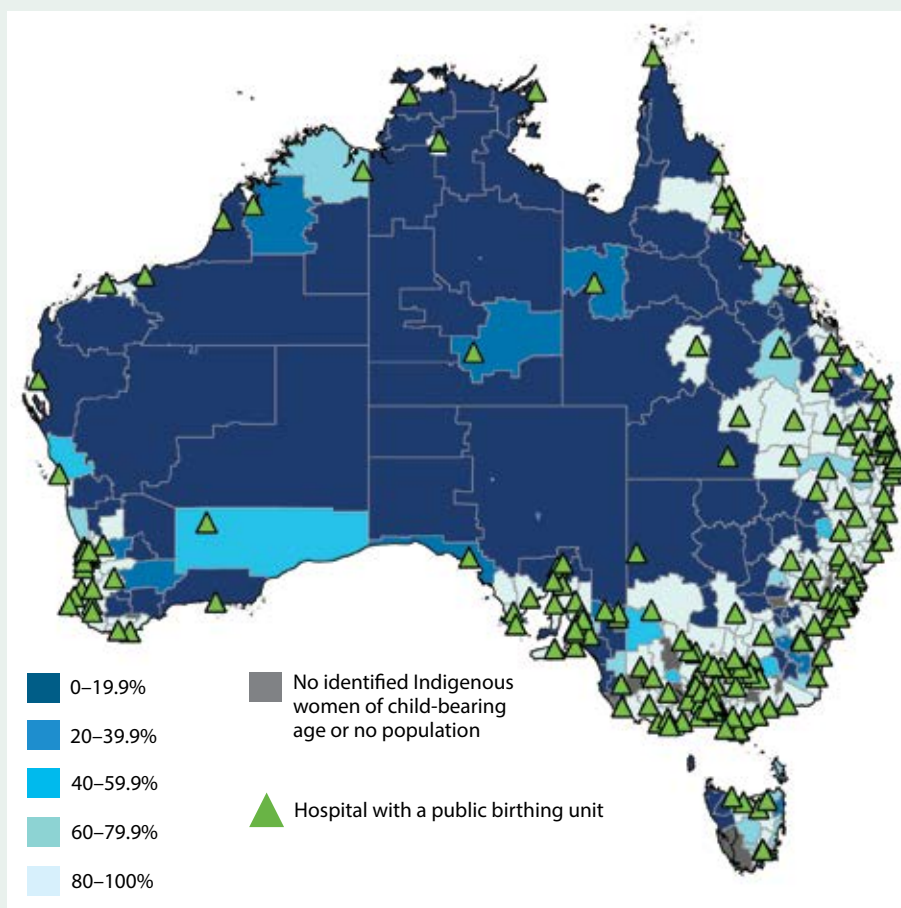


Drive time to hospitals with public birthing units

Figure 6.7.3 shows the percentage of Indigenous women of child-bearing age within each SA2 who live within a one-hour drive from a hospital with a public birthing unit. Only public birthing units are included in this analysis, as they provide services to all pregnant women. The darker colours on the map illustrate the areas with poorer spatial access to public birthing units. There are 126 SA2s where at least 75% of Indigenous women of child-bearing age live more than a one-hour drive from a public hospital with a birthing unit; 18 SA2s where between 50% and 75% of Indigenous women live outside a one-hour drive; and an additional 64 SA2s where up to 50% of Indigenous women live outside a one-hour drive.



Figure 6.7.3: Proportion of Indigenous women of child-bearing age who live within a one-hour drive from a hospital with a public birthing unit, by SA2, 2015



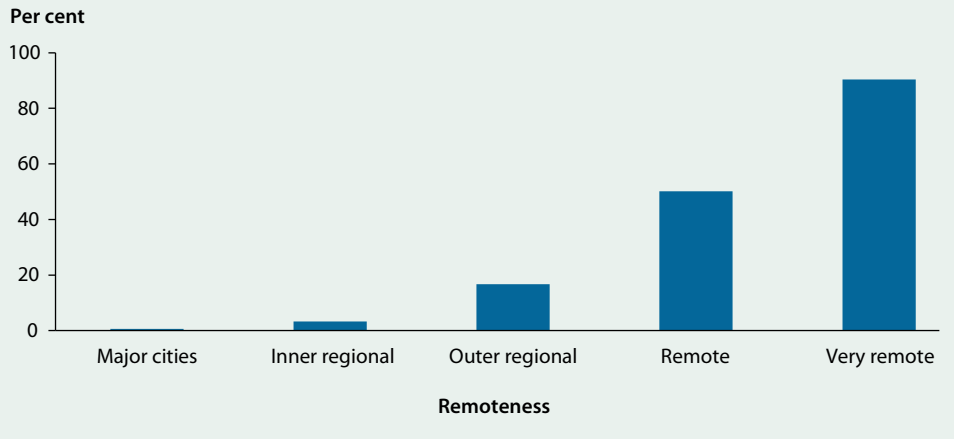
The one-hour travel time was selected as a reasonable upper limit for a pregnant woman to be driven to a hospital after the onset of contractions/spontaneous rupture of amniotic membranes or a medical emergency such as vaginal bleeding, based on a similar study in the United States (Rayburn et al. 2012). Research in rural British Columbia has shown that the incidence of poor birth outcomes is higher for women living outside an hour's drive of a birthing service, even after controlling for maternal characteristics (Grzybowski et al. 2011).

Comparing figures 6.7.2 and 6.7.3 shows that even if there is a hospital with a birthing unit within the SA2, spatial accessibility may be limited due to distance and road conditions. The results show that approximately one-fifth (21%) of Indigenous women of child-bearing age (around 26,600) live more than one hour's drive from the nearest hospital with a public birthing unit. Poorer spatial accessibility is high in areas with large numbers of Indigenous women of child-bearing age: in 11 of the 14 SA2s with more than 500 Indigenous women of child-bearing age, less than 20% of Indigenous women live within a one-hour drive from a hospital with a public birthing unit.

Figure 6.7.4 shows the significant variation in spatial accessibility by remoteness.



Figure 6.7.4: Percentage of Indigenous women of child-bearing age who live outside a one-hour drive from a hospital with a public birthing unit, by remoteness, 2015



Only 1 in 10 (9.6%) Indigenous women of child-bearing age in *Very remote* areas live within an hour's drive of a public hospital with a birthing unit, compared with nearly 50% of Indigenous women in *Remote* areas and almost all women in *Major cities*.

Spatial accessibility of antenatal and postnatal services

One way to improve outcomes for Indigenous mothers and babies is through better access to antenatal care services, as studies have shown an association between inadequate antenatal care and increased risk of stillbirths, perinatal deaths, low birthweight and pre-term births (AIHW 2014; also see 'Chapter 5.2 Trends and patterns in maternal and perinatal health').

Comprehensive antenatal care services address a number of risk factors—not only maternal health issues, but also maternal behaviours such as smoking and alcohol use during pregnancy and maternal nutrition. For example, identifying women who smoke during pregnancy and offering them effective services for reduction or cessation during antenatal care has the potential to reduce low birthweight, particularly as smoking rates for Indigenous mothers are much higher than those for non-Indigenous mothers. The most recent age-standardised data shows that 48% of Indigenous mothers smoked during pregnancy, compared with 13% of non-Indigenous mothers (AIHW 2015a). Programs such as the Australian Nurse Family Partnership Program (ANFPP) have helped to reduce rates of smoking during pregnancy from 39% at commencement in the program to 23% at 36 weeks (ANFPP 2015).



Culturally competent antenatal care services are those in which woman-centred care is provided in ways that are respectful, understanding of local culture, and meet the emotional, cultural, practical and clinical needs of the women. There are a number of aspects which characterise culturally competent maternal care services, some of which include having specific Indigenous programs, having Aboriginal and Torres Strait Islander staff members, providing continuity of care, viewing women as partners in their care, having a welcoming physical environment and ensuring that cultural awareness and safety is the responsibility of all staff members in the service (Kruske 2011).

Currently, rates of antenatal care use early in pregnancy are lower for Indigenous mothers than they are for non-Indigenous mothers (51% of Indigenous mothers attend an antenatal visit in the first trimester, compared with 62% of non-Indigenous mothers).

Pregnant women can access antenatal care from three main types of health professionals, depending on their needs, preferences, resources, and location: midwives/nurse-midwives, GPs, and specialist obstetricians. Aboriginal health workers also provide support to Indigenous women. Antenatal care may be offered through a number of different sites and programs, such as hospitals, community health services, Indigenous specific health services, outreach clinics, private GPs' surgeries, and specialist obstetric practices.

Table 6.7.2 shows the numbers and distributions by remoteness of the four services offering antenatal/postnatal care that were included in this analysis. It illustrates the importance of RFDS and ISPHCS as primary health care providers in regional and remote areas.

Table 6.7.2: Number of service locations providing maternal health services, by remoteness and service type, 2015

	Hospitals with public birthing units ^(a)	GP practice locations ^(b)	ISPHCS ^(c)	RFDS ^(d)
Major cities	70	5,372	24	0
Inner regional	74	1,336	46	4
Outer regional	53	791	50	53
Remote	16	189	31	55
Very remote	7	318	100	183
Total	220	8,006	251	296

- (a) Only hospitals with public birthing units in 2015 were included in the analysis. This includes one private hospital in Tasmania which services public patients. The effect of not including other private hospitals in the spatial access measure is negligible, as the private birthing units are generally located in close proximity to public birthing units within the metropolitan and regional areas.
- (b) GP practice locations were sourced from AMPCo 2013. One of the roles of GPs is to provide antenatal and postnatal care for low-risk women and to refer to more specialised services where appropriate (see AIHW 2015b for further detail on the GP data).
- (c) The ISPHCS data represent Australian Government-funded services which report to the OSR collection (Online Services Report). We have not included any services that are only funded by the Northern Territory or other states/territories.
- (d) These data were provided by the RFDS and include RFDS clinic locations which provided maternal and child health services at some point over the period 2013–2015.

Each of the four types of services has an important role in antenatal and postnatal care. Hospitals with public birthing units may provide the advantage of continuity of care throughout pregnancy, childbirth, and postnatal care/discharge and may offer specific



programs for Aboriginal and Torres Strait Islander women. They also generally provide access to specialist obstetric care when required.

GP-led or GP-shared care is able to incorporate pregnancy-related care within the context of the broader primary health system, with referrals made to specialist obstetric services as needed.

Although well known for its medical extraction services, the RFDS is less well known for the primary care clinics it delivers to Australians in remote and isolated communities, where many of its patients are Aboriginal and Torres Strait Islander people. The clinics include GP and nurse-midwife services, and there is a GP helpline for RFDS clients that delivers telephone-based consultations.

Indigenous specific primary health care services embed their antenatal/postnatal care within a broader framework of culturally safe services and protocols, and a number of initiatives run by ISPHCS have led to higher rates of antenatal care attendance and improved birth outcomes for Indigenous mothers and babies (see AIHW 2014, Chapter 3).

Figures 6.7.5 and 6.7.6 present the physical locations of the maternal health services included in this analysis, for western and eastern Australia, by the number of Indigenous women of child-bearing age, followed by maps for Sydney, Darwin and Perth (figures 6.7.7, 6.7.8 and 6.7.9).

The maps highlight several key points:

- While there is overlap between the service types in urban and some regional areas, outlying areas may be covered by only one type of service.
- There are a number of ISPHCS and the RFDS clinics in the large, remote SA2s with larger numbers of Aboriginal and Torres Strait Islander women of child-bearing age (the darker blue areas on the maps).
- Regional areas in eastern Australia appear to have more services than similar areas in western and central Australia.
- The maps for the included cities (Sydney, Perth and Darwin) show that many of the SA2s with more than 100 Indigenous women of child-bearing age have multiple services.



Figure 6.7.5: Locations of maternal health services and number of Indigenous women aged 15–44, by SA2, western and central Australia

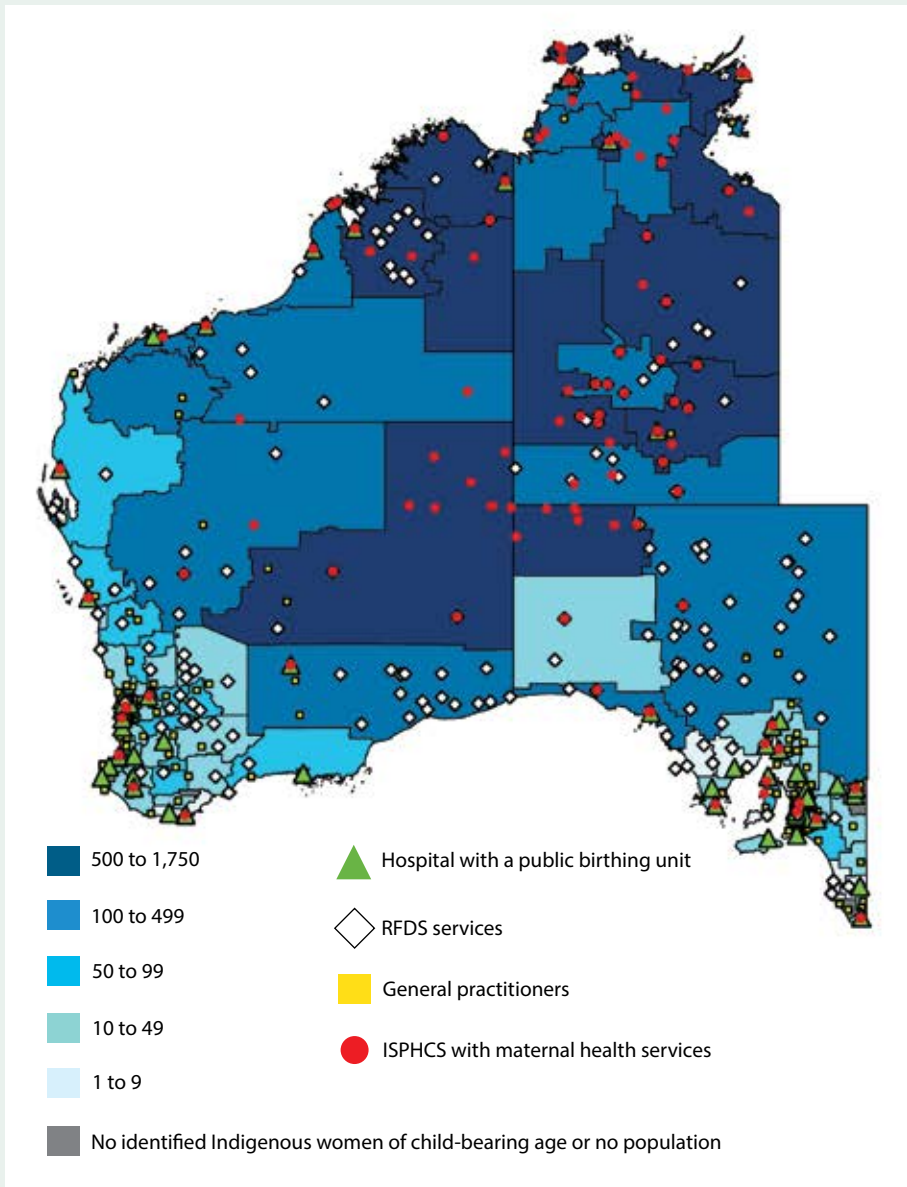




Figure 6.7.6: Locations of maternal health services and number of Indigenous women aged 15–44, by SA2, eastern Australia, 2015

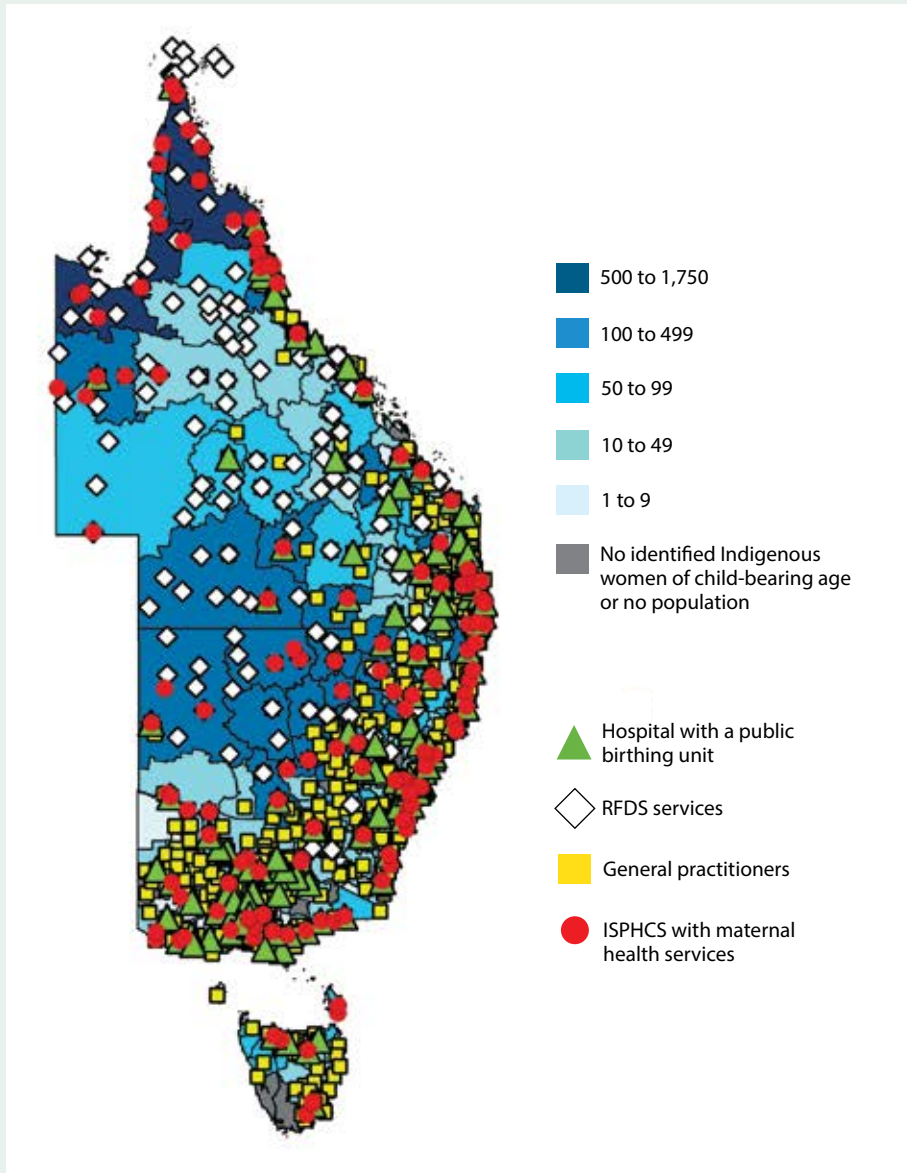
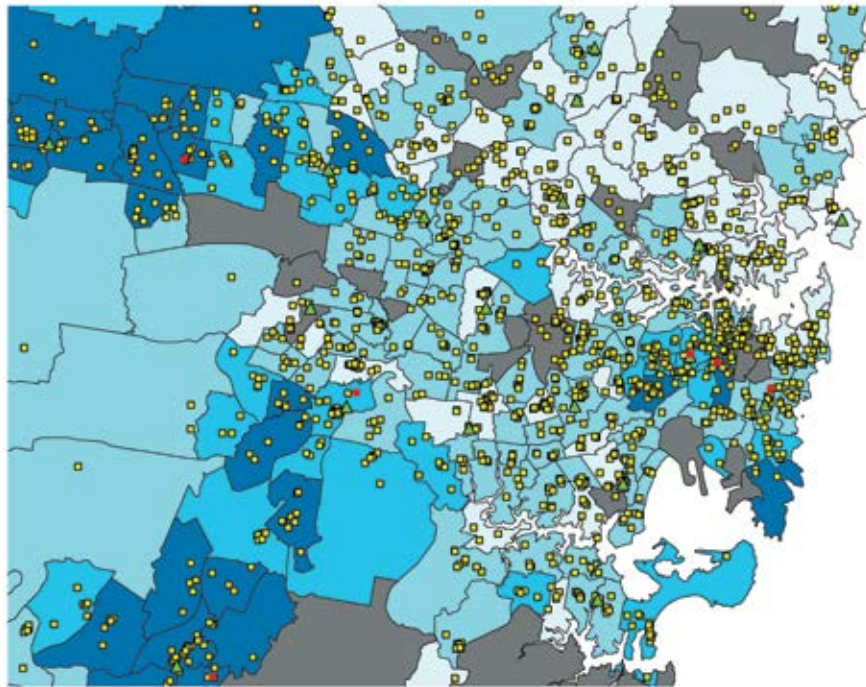




Figure 6.7.7: Locations of maternal health services and number of Indigenous women aged 15–44, by SA2, Sydney, 2015



- 100 to 499
- 50 to 99
- 10 to 49
- 1 to 9
- No identified Indigenous women of child-bearing age or no population
- Hospital with a public birthing unit
- General practitioners
- ISPHCS with maternal health services

Indigenous women of child-bearing age 5,863	Hospital with a public birthing unit 19	Number of GP practice locations 1877	ISPHCS with maternal health services 5
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Figure 6.7.8: Locations of maternal health services and number of Indigenous women aged 15–44, by SA2, Darwin, 2015

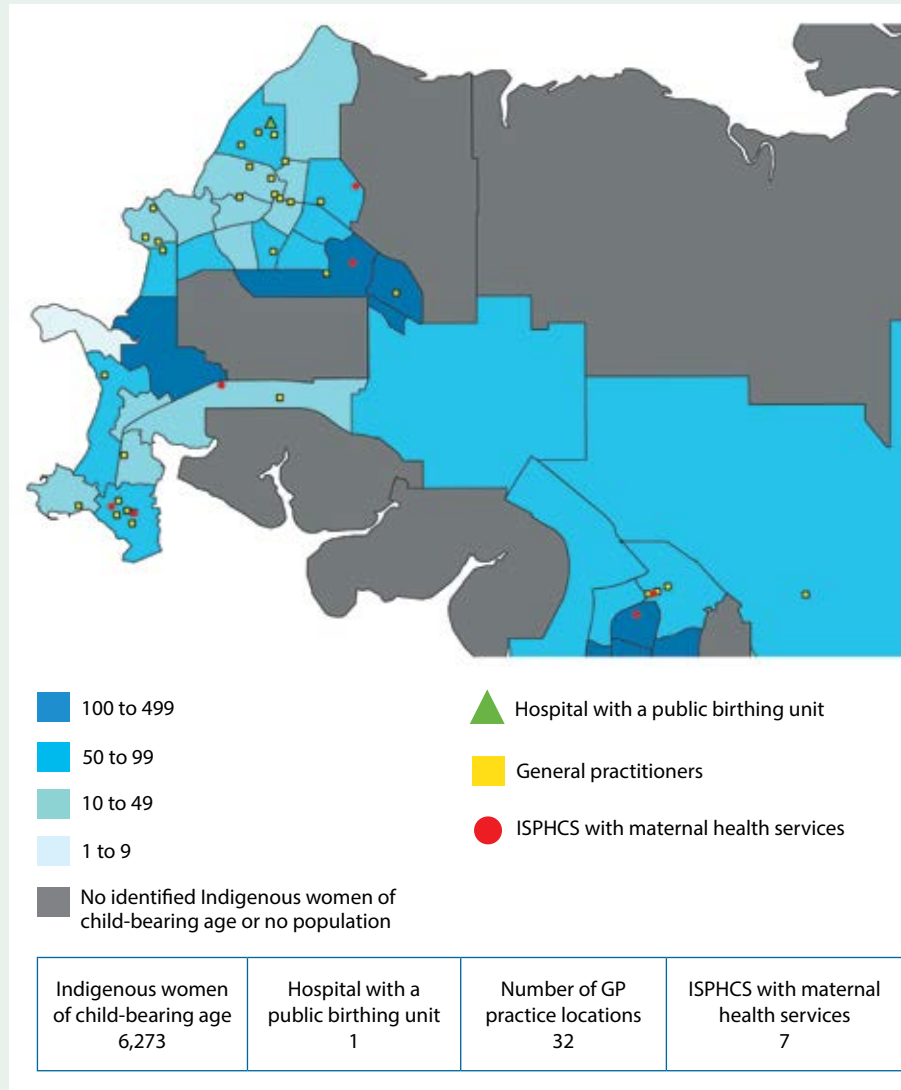




Figure 6.7.9: Locations of maternal health services and number of Indigenous women aged 15–44, by SA2, Perth, 2015

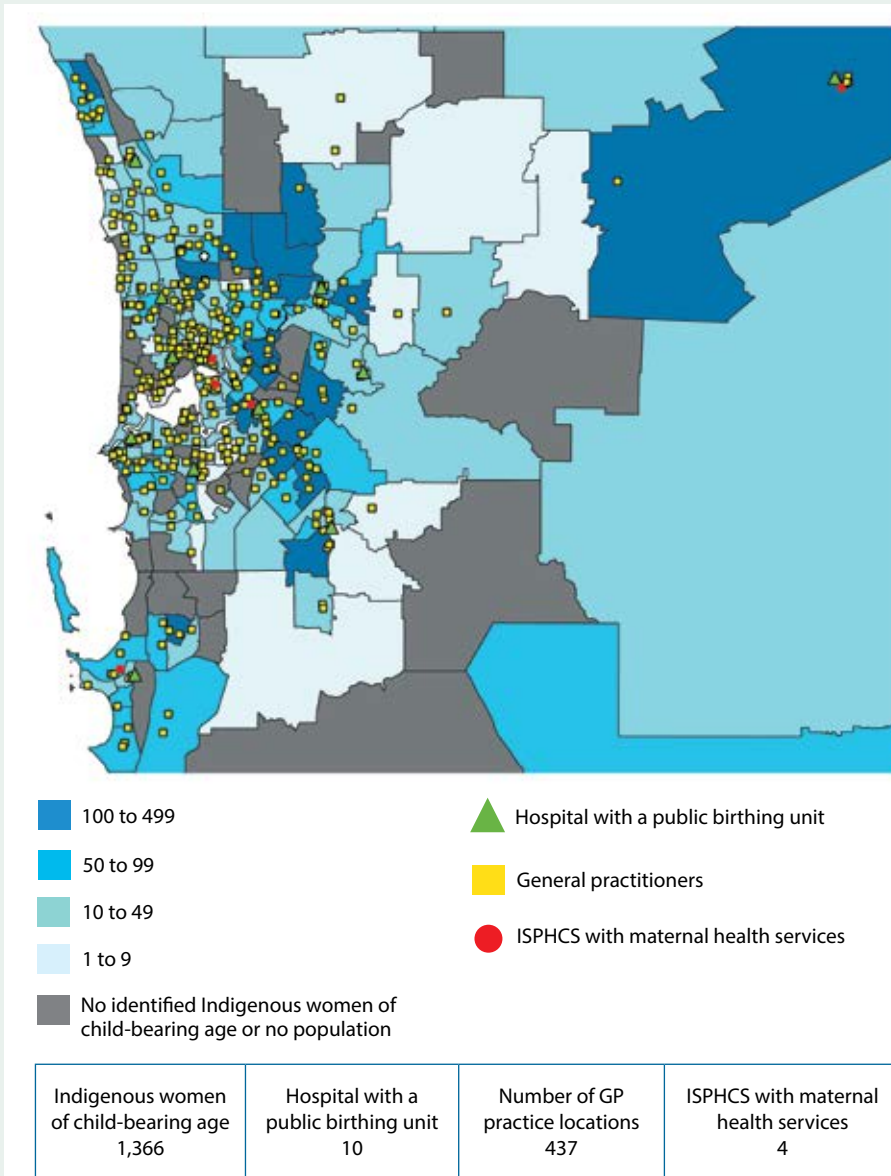




Table 6.7.3 presents the percentage of Indigenous women of child-bearing age in each SA2 who are within a one-hour drive to each type of service as well as a measure of how many women are within a one-hour drive to at least one type of service. It is important to acknowledge that the results measure the availability of any type of service—they are not able to take into account individual women's preference for a particular type of service.

Table 6.7.3: Percentage of Indigenous women of child-bearing age (15–44) living within a one-hour drive of a maternal health service, by remoteness and service type

	Hospital with a public birthing unit	GP	ISPHCS	RFDS ^(a)	Any of the services	Number of Indigenous women
Major cities	99.7	99.9	99.3	1.2	100.0	42,439
Inner regional	96.7	99.8	88.8	23.6	100.0	26,765
Outer regional	83.3	99.8	84.4	28.0	99.9	27,140
Remote	49.8	85.1	76.6	26.8	93.2	10,209
Very remote	9.6	64.8	49.4	60.2	84.2	17,605
Total	78.6	93.6	86.6	28.0	97.0	124,158

(a) The RFDS clinics are conducted at specific locations (such as schools, roadhouses, a shed) to which patients from surrounding areas must travel in order to access the service. Thus, travel times are still applicable for RFDS clinics.

The table highlights several patterns:

- Nearly all Indigenous women of child-bearing age (97%) have access to at least one type of maternal health service within a one-hour drive. The lowest percentages of women are in *Very remote* and *Remote* areas, where 84% and 93%, respectively, have access to at least one type of service, although the lack of spatial access to birthing units needs to be acknowledged.
- Indigenous women of child-bearing age in *Major cities* and regional areas have more types of services available to them within a one-hour drive than do women in more remote areas. Thus, they have more choice in which service they use.
- From a service planning perspective, the locations of the ISPHCS and RFDS in *Remote* and *Very remote* areas are complementing, not duplicating, each other. However, it is important to remember that the RFDS services are planned clinics—they are not 'on the ground' all the time.

What is the AIHW doing?

The AIHW is undertaking similar spatial analyses of access to child health services. The next step in this work is examining the extent to which access to birthing services and maternal and child health services has an effect on infant and child health.

What is missing from the picture?

The data do not include information on services which are wholly funded by states and territories and do not report to the Online Services Report data collection. This analysis has focused on spatial accessibility of services only. Other aspects of accessibility (such as cultural competence, financial accessibility, and the capacity of services) are important, but are not able to be assessed given the scope of this analysis.



Where do I go for more information?

For related reports on Indigenous Australians' access to services, see [Spatial variation in Aboriginal and Torres Strait Islander people's access to primary health care](#) and [Access to primary health care relative to need for Indigenous Australians](#).

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