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# Do migrant women have equity of access to midwife continuity of care?

Sarah J. Melov [a,b,*], James Elhindi [a], Helena Qian [c,d], Olivia Byrnes [e], N. Wah Cheung [a,f], P. Michelle de Vroome [g,h], Geraldine Gilroy [i], Tanya Nippita [a,g,h], Michelle Simmons [j], Gayatri Talla [k], Lisa White [l], Dipti Zachariah [m], Allison Cummins [n], Dharmintra Pasupathy [a]

[a] Reproduction and Perinatal Centre, Faculty of Medicine and Health, The University of Sydney, Sydney, Australia
[b] Westmead Institute for Maternal and Fetal Medicine, Women's and Newborn Health, Westmead Hospital, Westmead, Australia
[c] Royal Hospital for Women, Randwick, NSW, Australia
[d] University of New South Wales, Sydney, NSW, Australia
[e] Nepean Hospital, Kingswood, NSW, Australia
[f] Department of Diabetes & Endocrinology, Westmead Hospital, Westmead, Australia
[g] Royal North Shore Hospital, Northern Sydney Local Health District, Sydney, NSW, Australia
[h] The University of Sydney, Faculty of Medicine and Health, Sydney, Australia
[i] Central Coast Local Health District, Gosford, NSW, Australia
[j] Women's and Newborn Health, Westmead Hospital, Westmead, Australia
[k] Consumer representative, Western Sydney Local Health District, Sydney, NSW, Australia
[l] Women's Health Maternity, Blacktown and Mt Druitt Hospitals, Blacktown, NSW, Australia
[m] The Statewide Health Literacy Hub, NSW Department of Health; The University of Sydney, Sydney, NSW, Australia
[n] Newcastle University, Central Coast Clinical School, Gosford, NSW, Australia

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ABSTRACT

*Background:* Migrant populations are recognised to be at increased risk of adverse health outcomes including perinatal outcomes. Structural barriers to maternity care and racism are recognised globally as an urgent issue for migrants. Midwife continuity of care (MCoC) has well known improved perinatal benefits.
*Aim:* To investigate if duration since migration was associated with reduced access to MCoC.
*Methods:* We conducted a retrospective cohort study from June 2020–November 2023 at six Australian hospitals. MCoC was investigated by hospital and self-identified ethnic group for women who migrated < 5 years, ≥ 5 years compared to the Australian born population. Regression models adjusted for significant factors including use of interpreter and co-morbidities.
*Findings:* There were 48,240 participants for analysis. Most in the cohort were Australian born (54.7 %, n = 26,365), migrants of < 5 years comprised 13.2 % (n = 6388) and those who migrated ≥ 5 years 32.1 % (n = 15,487). At all study hospitals, new migrants had the least access to MCoC. Compared to Australian born women, new migrants were 70 % less likely to receive MCoC (aOR 0.30; 95 %CI 0.27–0.34) and migrants of ≥ 5 years were 49 % less likely (aOR 0.51; 95 %CI 0.48–0.56). We identified a difference to access to MCoC between ethnic groups.
*Discussion:* Health literacy needs of women who are migrants should be addressed to improve equity of access to a model of care that is evidenced based to improve perinatal outcomes.
*Conclusion:* It is incumbent on health services to measure equity of access and adjust services to ensure equity of access for all populations.

**Statement of Significance**

**Problem**

It is unknown if access to midwife continuity of care may differ for women who are migrants by ethnicity and duration of residency in host country.

* Correspondence to: Westmead Institute for Maternal and Fetal Medicine, Research and Education Building, Crn Hawkesbury and Darcy Rd, Westmead, New South Wales 2145, Australia.
*E-mail address:* Sarah.melov@health.nsw.gov.au (S.J. Melov).

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**What is already known**

Women who are migrants are at greater risk of adverse perinatal outcomes than native born women. Midwife continuity of care improves perinatal outcomes including both increased likelihood of a spontaneous vaginal birth and a positive birth experience as well as improved breastfeeding.

**What this paper adds**

Women who are migrants have less access to midwife continuity of care. There was a graded increase to access to this model of care as duration since migration increased. The stepped access favouring Australian born women was present at six hospitals in this research, highlighting the need for a systemic change in intake processes for continuity model of midwifery care.

## 1. Background

Globally there are estimated over 280 million international migrants – 3.6 % of the total world population and increasing [1]. In 2020 the United States and Germany were documented to have the highest number of migrants globally and Australia was ranked after Canada in ninth position [1]. However, as a percentage of a population, Australia's migrant populace ranks among the highest in the world. In Australia approximately 30.7 % of the population is a migrant, this is higher than Canada (21 %), Germany (19 %), the United States of America (USA) (15 %), and the United Kingdom (UK) (14 %) [2]. Understanding the needs and health outcomes of an ethnically diverse population is therefore a global public health issue with migrancy status a recognised determinant of health [3,4].

There is no universally accepted definition for migrant, with terminology often dependent on context [1]. International migrants are defined by the United Nations as someone who moves from their country of usual residence, this is irrespective of their legal status in the host country or cause for migration or duration of residency [1]. The Australian Bureau of Statistics utilises the United Nations inclusivist definition [5]. Migrants within this definition are a highly heterogeneous group with varying health risk profiles often dependent on experience in their country of origin, reason and journey to host country. Migrant health research can be inclusive of all migrants or focus on groups who may experience greater adversity such as refugees or migrants from low- or middle-income countries. Some recent maternal care systematic reviews have been inclusive in their migrant definition as any foreign born person, including those who identify as White ethnicity and speak the local language [6,7].

It is of concern that in high income countries, significant disparities in perinatal outcomes exist for both migrant groups and ethnic minority populations when compared to the native born dominant population [8–11]. Women who are migrants are at increased perinatal risk including higher rates of preterm birth and low-birth weight [8,9,12–14]. The large UK perinatal mortality surveillance review (MBRRACE-UK 2023) reported White ethnicity irrespective of migrancy status, was associated with the lowest stillbirth and neonatal mortality rates [10]. Maternal mortality is a stark indicator of maternity care. In the UK Black women are four times more likely to die than White women and women of Asian ethnicity twice as likely [10]. Additionally, refugee women may be at an increased risk, with an Australian study identifying this group was at a higher risk than Australian born for both maternal and infant adverse outcomes including maternal admission to intensive care, postpartum haemorrhage, stillbirth and neonatal death [15].

Health disparities for migrant populations are recognised not to be based on individual racial differences but grounded in the complex discrimination of sociocultural barriers that often prioritise White populations [11,14,16,17]. It is important to understand the significant impact of racism within structural barriers in maternal care that underpin important social determinants of health [16,18]. Educational attainment, chronic stress, secure housing, income and employment opportunities are some determinants of health associated with structural racism that are linked to adverse perinatal outcomes [11,16,18].

Structural racism has also been identified to contribute to higher maternal mortality rates recorded in both the UK and the USA for ethnic minority groups [11,19,20]. Sadly, the overall maternal mortality rates in the United States have increased, with maternal deaths for Black women recorded to be 3.55 times higher than White women from the USA [21]. A recent systematic review reported migrant maternal mortality varied in high income countries [22]. Higher mortality rates for migrants were reported in Europe compared to native born women, authors concluding there is a need to understand the drivers for these inequalities [22]. Australian research has identified maternal outcome variation between ethnic migrant groups, finding higher rates of birth interventions, low birth weight and stillbirth for South Asian migrant women compared to Australian born women [12,23,24]. South Asian migrant women had a 26 % greater odds of a stillbirth than Australian born women [12]. To improve perinatal outcomes and provide culturally safe care, there is a need to understand appropriate models of care and structural racism.

Globally understanding the structural barriers to maternity care are critical, including access to midwife continuity of care due to the identified improved maternal outcomes associated with this model of care [25]. Midwife continuity of care is defined as a woman having a primary midwife carer or small group of midwives throughout her pregnancy, birth and the postpartum period [25]. Midwife continuity of care also includes collaborative care by specialist medical teams when required [25]. Evidence based benefits of midwife continuity of care include a reduced risk of caesarean section or instrumental birth, and high levels of satisfaction [25]. There is also supporting evidence that midwife continuity of care may improve outcomes for women with a history of mental illness and the model is cost-efficient [25–27].

Women who are migrants have identified that culturally responsive care with trusting relationships are important, and this can be achieved with a continuity of care model [28,29]. Women who are migrants have been documented to be unaware of maternity services available and are reported to have lower levels of availability of a named midwife [7]. Current models of care which have been explored to meet the needs of refugee and migrant women include support doulas, community health workers who are bicultural and peer mentors, but often these services lack economic evaluation to ensure feasible implementation and sustainability [15,30]. However, when relational continuity of care is provided to women who are migrants, research identifies this underpins trust and improves confidence to attend and value antenatal appointments [6,29]. Models of maternity care that encompass relational care, cultural safety principles, inclusive of trauma informed care and interpreting, have been identified to be valued by migrant women and improve important outcomes including higher odds of a normal birth [6,29,31,32].

The urgency to adhere to the principles of culturally safe care is highlighted in the growing awareness and documentation of obstetric violence worldwide, inclusive of racial discrimination of migrant women [33,34]. In a sample of Australian women, 12 % who were surveyed report "yes" or "maybe' on a question regarding experiencing obstetric violence [34]. Disturbingly a much higher 45 % global prevalence estimate of obstetric violence has been reported [35]. The recent Australian New South Wales Birth Trauma Inquiry reported women's experience of both racism and discrimination, with Inquiry recommendations that better care and improved outcomes would occur with greater access to midwife continuity of care, as well as more inclusive and respectful maternity care [36].

Health literacy can be categorised into environment or individual [37]. Individual health literacy can be defined as the ability for a person to access and understand health care and information to make informed decisions about their health [37–39]. Some authors have suggested that health literacy issues for migrants may be improved with continuity of

care and therefore their understanding and access to optimal perinatal care [40].

Research including within the Australian context, suggest that effective models of care need to be explored to improve perinatal outcomes for women who are migrants and those with social risk factors [24,25]. Unfortunately, in Australia, midwifery continuity of care is only available at 42 % of maternity care hospitals and nationally there is only one known dedicated migrant and refugee midwife continuity of care service we are aware of [41,42].

Of interest, migrant research is often unable to disaggregate duration since migration to assess the impact of this variable on both perinatal outcomes, and for benchmarking between models of care to identify optimal maternity care and has been listed as a limitation in some research [40]. A recent systematic review highlighted the lack of literature in this area, suggesting further research is needed regarding duration of residency in a host country on maternal outcomes for women who are migrants [43]. Access to maternity services that are recognised to improve outcomes such as midwife continuity of care, warrant investigation to more broadly understand equity needs and outcomes in this population. Our prespecified aim was to identify variations in outcomes for migrant women in New South Wales. In this analysis we investigate in a large diverse population, access to midwife continuity of care based on ethnicity and duration of time since migration.

## 2. Methods

### 2.1. Study design

A retrospective cohort study was conducted examining routine birth data from 1st June 2020–30 th November 2023 [44]. The routine data was hospital-level with the study period extraction by infant date of birth. The study period was determined by the introduction date of the exposure 'years lived in Australia' variable at all study hospitals.

#### 2.1.1. Setting and data

Maternity data was accessed for six hospitals in four local health districts in New South Wales, Australia. In keeping with the investigator agreement for the collaborative project, the study sites are anonymised. These hospitals provide care annually for approximately 24,500 (32 %) births in the state of New South Wales [45]. Geographic area for the study districts was approximately 12,712 square kms. Three health districts were in an urban setting and one a regional health district, all with diverse socioeconomic communities.

eMaternity is the electronic maternity data system utilised in the majority of public hospitals in the state of New South Wales, and collects variables for clinical care including those for the state and national perinatal data collection [45]. eMaternity was used for data collection at all study hospitals. The data accessed for this study is entered at the first comprehensive antenatal visit called the 'booking' visit, data are entered by midwives. Inclusion criteria were all women with a singleton pregnancy who had the universal insurance Medicare and admitted to a publicly funded hospital. Exclusion criteria were multiple pregnancy or an initial referral at booking to the high-risk antenatal medical clinic. Other exclusion criteria were missing data for the primary exposure of migrancy / ethnicity, and factors that exclude access to midwife continuity of care at booking — no antenatal care or receiving private obstetric or midwifery care at presentation.

### 2.2. Variables of interest

#### 2.2.1. Ethnicity

Ethnicity is self-assigned by participants at hospital booking with the question "What ethnic group [do you] identify with"?, responses are then recorded in the eMaternity database. Both Australian born and migrants respond to this question. There are 33 ethnicity categories in a drop-down menu including 'mixed' and 'other' option to be self-selected by participants as well as a free text option. Due to low numbers, mixed ethnicity was grouped as 'other' for analysis and most free text. Although participants selected Caucasian as their identified ethnicity, it is viewed as an obsolete term [46,47]. Caucasian/European category is reported in our tables and text as 'White people'. Free text responses that identified a specific European country as their ethnicity was included in the White ethnic group and further ethnicity information is detailed in Supplementary 1. There is no field to identify migrants who are refugees.

#### 2.2.2. Midwife continuity of care model

The variable 'midwife continuity of care' was similar between all study hospitals as defined by investigators at each site. A primary midwife for each woman provided care throughout pregnancy, birth and the postpartum period for up to two weeks. Midwives usually worked as pairs within a team of 4–6 midwives caring for a woman. The primary midwife could be contacted by the woman 24 hours a day directly by phone, this phone is diverted to the backup midwife (from the pair) when the primary midwife is unavailable. Women meet both the primary and back up midwife during the antenatal period. Generally, women are discharged home directly from the birth unit after four hours if there are no complications or concerns with the mother and/or baby. Each midwife at the study hospitals cares for 36–40 women per year (Supplementary 2). Most services have a 'no exit' policy. Irrespective of the pregnancy complexity that may develop, they will remain in the continuity of care service with their midwives and receive additional medical care.

The referral process for a woman to be accepted into the midwife continuity of care service varied between hospitals (Supplementary 2) but included a Facebook link, directly phoning a known continuity of care midwife, electronic referral by the general practitioner, phoning a central number to be placed on a waitlist and waiting for a call when a vacancy was available. Continuity of care midwives generally allocate themselves women for their caseload from a waitlist.

#### 2.2.3. Socioeconomic status

Socioeconomic status of participants was derived from the 2021 Australian census that informs the area (suburb) level Index of Relative Socioeconomic Disadvantage informed by census data of various household measures (IRSD) [48]. Variables used to inform the IRSD include education level for adults, assistance required with core activities due to health condition, employment, income and mortgage payments [48].

#### 2.2.4. Migration status

The migration duration was dichotomised to $< 5$ years, $\geq 5$ years based on previous literature as well as recognition that there are greater health literacy barriers for new migrants. The five year category is frequently used within migration research [49].

### 2.3. Analysis

Statistical analysis was conducted in R Studio Version 4. Statistical hypotheses were assessed at a significance level of 0.05 with a two-sided alternative. The study's exclusion criteria ensured that there was no missing data amongst the primary exposure variable duration of residence and the response variable. Other explanatory variables with missing data were not imputed.

The proportion of each group to receive midwife continuity of care was investigated for the total cohort and by hospital. Summary statistics were analysed for the total cohort and migrant populations. Logistic regression models adjusted for significant factors: interpreter use, hospital of booking, area level socioeconomic status, ethnicity, maternal age, gestation at first comprehensive pregnancy medical visit, BMI, parity, Edinburgh Postnatal Depression Scale (EPDS) and comorbidities: illicit drugs, alcohol in early pregnancy, smoking early pregnancy, prior gestational diabetes, chronic hypertension, prior pregnancy induced

hypertension, prior preterm birth, prior caesarean section.

To determine if ethnicity was a factor in accessing models of care for women who are migrants, a likelihood ratio test determined whether the addition of an interaction parameter between migrant status and ethnicity improved the overall fit of the model. Further investigation was undertaken disaggregated by ethnicity to understand the nature of the interaction effects. Odds ratios, 95 % confidence intervals, and p-values were reported.

### 2.4. Consumer engagement

Consideration of factors that may impact migrant populations was through an inclusive and diverse investigator group that included migrants, the consumer voice and cultural expertise to provide context and contribute to the ethical conduct and interpretation of the research. The consumer investigator was involved in all aspects from project development to review of the manuscript and co-presentation of findings. The clinician researchers provided opportunity for timely and effect implementation of changes to address service gaps identified for our migrant community [50].

### 2.5. Ethics

Ethical approval was gained on May 3, 2023, by the Western Sydney Local Health District Human Research Ethics Committee reference number: 2022/ETH02685.

## 3. Findings

There were 56,518 women with birth data at the six study hospitals. After exclusions data for 48,240 participants were available for analysis (Fig. 1). In the total cohort 45.3 % (n = 21,875) were migrants, with new migrants of < 5 years 13.2 % (n = 6388) of the cohort, women who had migrated ≥ 5 years 32.1 % (n = 15,487) (Fig. 1). Most of the cohort were Australian born (54.7 %, n = 26,365) (Fig. 1) however, four hospitals had migrant populations ≥ 50 % (Table 1).

The median residency for women who were migrants was 7 years (IQR 4–13). Amongst the migrant cohort, the most common ethnicity was South Asian (38.2 %, n = 8350) and this group were the dominant migrant group for both < 5 years and ≥ 5 years since migrating (Table 1). It was identified that 22 % (n = 1402) of new migrants reported the use of interpreters at hospital booking and 7.2 % (n = 1115) for ≥ 5 years migrants (Table 1). English was reported to be spoken at home by 94 % of women who identified as White and 71 % of migrants that identified as South Asian. All migrant groups languages spoken at home are detailed in Supplementary 3.

Migrants were more likely to be older and in the highest two socio-economic quintiles compared to Australian born women (Table 1). Six weeks was the median gestation for the first comprehensive medical assessment for all groups. This assessment usually occurs with a woman's family doctor. Australian born women compared to migrant women were younger, had a higher BMI, more likely to report smoking or illicit drug use and have a higher EPDS score and more likely to have a history of preterm birth (Table 1). There was a difference between women who were migrants and women who were Australian born regarding their medical and obstetric history (Table 1).

### 3.1. Midwife continuity of care

Overall, 23.0 % (n = 6063) of Australian born women received midwife continuity of care, women who migrated ≥ 5 years ago 11.8 % (n = 1825) and recent migrants (< 5 years) had the lowest proportion of midwife continuity of care 6.4 % (n = 411). Data disaggregated by hospital displayed the same findings of graded access to this model of care by duration of residency. In adjusted analysis, at all hospitals the lowest proportion of women receiving midwife continuity of care were new migrants (3–11 % receiving midwife continuity of care) (Fig. 2).

In unadjusted analyses migrants of ≥ 5 years ago were 64 % (OR 0.36; 95 % CI 0.34–0.39) less likely to receive midwife continuity of care than Australian born women and new migrants were 83 % less likely (OR 0.17; 95 %CI 0.16–0.19) (Table 2a). After adjusting for significant confounders, we identified a similar trend. Women who had migrated ≥ 5 years ago had an improved chance compared to new migrant women, however were still 49 % less likely (aOR 0.51; 95 %CI 0.48–0.56) to receive this model of care and new migrants 70 % less likely (aOR 0.30; 95 %CI 0.27–0.34) compared to Australian born women (Table 2b).

To further investigate sociocultural factors associated with accessing midwife continuity of care amongst migrants, disaggregation of data by ethnicity was considered and the addition of an interaction parameter supported by a likelihood ratio test (p < 0.01). New migrant women who were Middle Eastern and Southeast Asian ethnicity had the lowest access to midwife continuity of care compared to Australian born women. Recent Southeast Asian migrant women were 81 % less likely (aOR 0.19; 95 %CI 0.15–0.26) and migrant women who identified as Middle Eastern ethnicity were 78 % less likely (aOR 0.22; 95 %CI 0.15–0.34) than Australian born women (Table 2b) to receive this model of care. White recent migrant women were 64 % less likely (aOR 0.56; 95 %CI 0.45–0.69) than Australian born cohort. Migrants who self-identified as White who migrated ≥ 5 years had a 28 % less chance

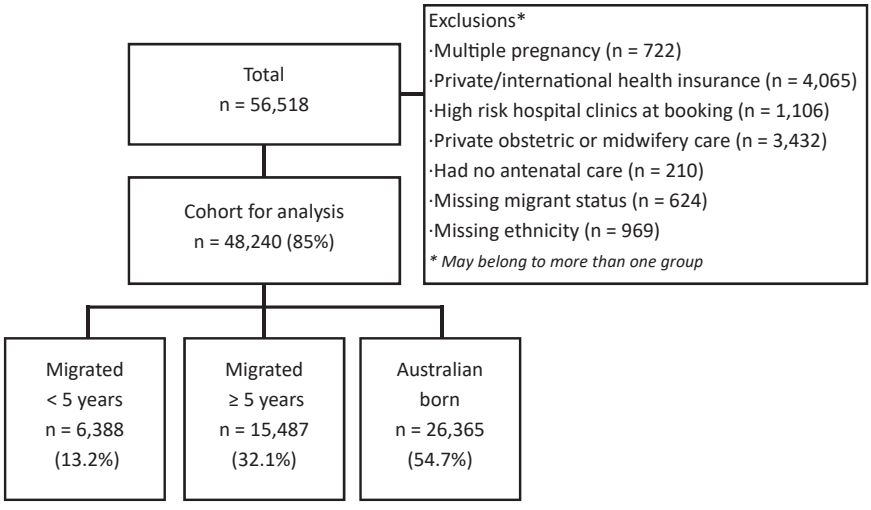


**Fig. 1.** Women who booked for maternity care at six hospitals in NSW Australia December 2020 to November 2023.

**Table 1**
Maternal characteristics by duration of residency total n = 48,240 (Migrants n = 21,875).

| Variable | Migrated < 5 years (n = 6388; 13.2 %) N (%) | Migrated ≥ 5 years (n = 15,487; 32.1 %) N (%) | Australian born (n = 26,365; 54.7 %) N (%) | p |
|---|---|---|---|---|
| Hospital (N) | | | | |
| Hospital 1 (10,395) | 25.7 % (1644) | 28.1 % (4357) | 16.7 % (4394) | < 0.01 |
| Hospital 2 (8552) | 5.0 % (317) | 6.7 % (1031) | 27.3 % (7204) | |
| Hospital 3 (2734) | 8.5 % (542) | 7.2 % (1108) | 4.1 % (1084) | |
| Hospital 4 (9612) | 7.4 % (474) | 13.5 % (2093) | 26.7 % (7045) | |
| Hospital 5 (5613) | 15.9 % (1018) | 15.2 % (2351) | 8.6 % (2262) | |
| Hospital 6 (11,316) | 37.5 % (2393) | 29.4 % (4547) | 16.6 % (4376) | |
| Ethnicity | | | | |
| White people | 9.4 % (598) | 15.0 % (2327) | 74.3 % (19582) | < 0.01 |
| South Asian | 51.3 % (3274) | 32.8 % (5076) | 1.3 % (327) | |
| Southeast Asian | 16.6 % (1061) | 25.5 % (3944) | 3.5 % (934) | |
| Middle Eastern | 13.4 % (856) | 12.1 % (1867) | 6.5 % (1700) | |
| Pacific peoples | 3.8 % (244) | 7.2 % (1108) | 3.4 % (895) | |
| Other | 5.6 % (355) | 7.5 % (1165) | 11.1 % (2927) | |
| Interpreter use | 22.0 % (1402) | 7.2 % (1115) | 0.2 % (42) | < 0.01 |
| Area socioeconomic quintile§ | | | | |
| 1 (lowest) | 18.7 % (1194) | 18.1 % (2808) | 20.0 % (5273) | < 0.01 |
| 2 | 11.2 % (715) | 10.7 % (1661) | 13.0 % (3435) | |
| 3 | 26.9 % (1719) | 26.7 % (4137) | 35.3 % (9316) | |
| 4 | 15.9 % (1014) | 13.9 % (2157) | 9.8 % (2579) | |
| 5 (highest) | 26.6 % (1698) | 30.2 % (4675) | 21.7 % (5732) | |
| Gestation 1st pregnancy assessment | 6 (5 – 8) | 6 (5 – 7) | 6 (5 – 7) | < 0.01 |
| Maternal Age *m* (IQR) | 32 (29 – 34) | 34 (31 – 36) | 30 (26 – 33) | < 0.01 |
| Maternal Age | | | | |
| < 20 | 0.2 % (10) | 0.3 % (43) | 2.3 % (595) | < 0.01 |
| 20 – 24 | 6.4 % (411) | 3.3 % (506) | 14.5 % (3811) | |
| 25 – 34 | 68.7 % (4390) | 54.5 % (8441) | 64.2 % (16915) | |
| 35 – 39 | 21.1 % (1350) | 33.7 % (5223) | 15.7 % (4132) | |
| ≥ 39 | 3.6 % (227) | 8.2 % (1274) | 3.5 % (912) | |
| BMI *m* (IQR) | 23.9 (21.42 –26.99) | 24.5 (21.76 – 28.23) | 25.6 (22.24 – 30.69) | < 0.01 |
| BMI kg/m$^2$ | | | | |
| < 18.5 | 4.3 % (274) | 3.4 % (529) | 3.3 % (866) | < 0.01 |
| 18.5–24.9 | 55.9 % (3572) | 50.8 % (7869) | 42.9 % (11298) | |
| 25.0–29.9 | 28.0 % (1787) | 28.0 % (4341) | 26.2 % (6895) | |
| ≥ 30 | 11.8 % (755) | 17.7 % (2748) | 27.7 % (7306) | |
| Parity | | | | |
| 0 | 51.4 % (3285) | 32.2 % (4990) | 41.6 % (10974) | < 0.01 |
| 1 | 36.4 % (2325) | 42.2 % (6540) | 32.5 % (8578) | |
| 2 + | 12.2 % (778) | 25.6 % (3957) | 25.8 % (6813) | |
| EPDS | | | | |
| Low (0−9) | 86.8 % (5542) | 86.6 % (13408) | 83.1 % (21901) | < 0.01 |
| Medium (10−12) | 7.0 % (449) | 6.7 % (1035) | 7.1 % (1883) | |
| High (≥13) | 4.6 % (296) | 5.1 % (785) | 7.2 % (1908) | |
| Report illicit drug use | 0.4 % (28) | 0.7 % (119) | 3.2 % (831) | < 0.01 |
| Alcohol early pregnancy | 0.8 % (48) | 1.1 % (168) | 1.9 % (494) | < 0.01 |
| Smoking early pregnancy | 1.2 % (76) | 2.9 % (447) | 10.9 % (2867) | < 0.01 |
| Chronic hypertension† | 0.6 % (41) | 1.4 % (217) | 1.3 % (334) | < 0.01 |
| Prior gestational diabetes† | 9.8 % (303) | 13.4 % (1401) | 3.9 % (597) | < 0.01 |
| Chronic hypertension† | 0.6 % (41) | 1.4 % (217) | 1.3 % (334) | < 0.01 |
| Prior pregnancy induced hypertension† | 3.5 % (107) | 4.3 % (456) | 7.4 % (1133) | < 0.01 |
| Prior preterm birth† | 8.8 % (273) | 8.8 % (928) | 11.0 % (1694) | < 0.01 |
| Prior caesarean section† | 33.5 % (1039) | 23.5 % (2467) | 11.1 % (1706) | < 0.01 |

§Residence ranked level: Index of Relative Socioeconomic Disadvantage based on Australian census data (Australian Bureau of Statistics) EPDS=Edinburgh Postnatal Depression Scale
†Percentage calculated out of women who have had a prior pregnancy

(aOR 0.72; 95 %CI 0.64–0.80) of receiving midwife continuity of care compared to Australian born women (Table 2b). Each ethnic grouping had an improved chance of receiving midwife continuity model of care after 5 years of residency in Australia (Table 2b).

The overall trend of being allocated at booking to receive midwife continuity of care increased year on year by duration of residency in Australia for all migrant women (Fig. 3).

## 4. Discussion

In a large ethnically diverse cohort, we have identified that migrants had less access to midwife continuity of care compared to Australian born women. The contrast of reduced access to this model of maternity care was particularly stark for new migrants at all six hospitals. White migrants' access was closest to Australian born women's access. Although all women at the study sites have equality of access, our findings highlight health care equity issues in our public health system that clearly needs addressing. Issues of inequity in maternity care are increasingly recognised as an issue in high resourced countries. [11] However, we are unaware of any other research that has demonstrated a relationship between duration since migration and access to this model of care.

Barriers to accessing midwife continuity of care for migrants may be similar to barriers for all migrants to access health care. However, barriers in pregnancy may also include maternity institutional policies and cultural preferences for pregnancy care [43,51]. Migrants have recognised obstacles to timely hospital booking. Research identifies migrant women may not be aware of the pregnancy registering process or the services provided [52]. However, we found that women who are migrants were attending their first comprehensive visit to their family general practitioner at a similar gestation to Australian born women. Therefore, barriers to accessing midwife continuity of care may be particular to this model of care and not a result of late presentation to medical care, with cultural preferences potentially a contributing factor.

Some women may not be aware of midwife continuity of care. The models of care discussion usually occur with a woman's first visit and confirmation of pregnancy by a woman's general practitioner. It is interesting to note, in a large cohort of predominantly Australian born women, Stevens et al. identified that midwifery led options of care were

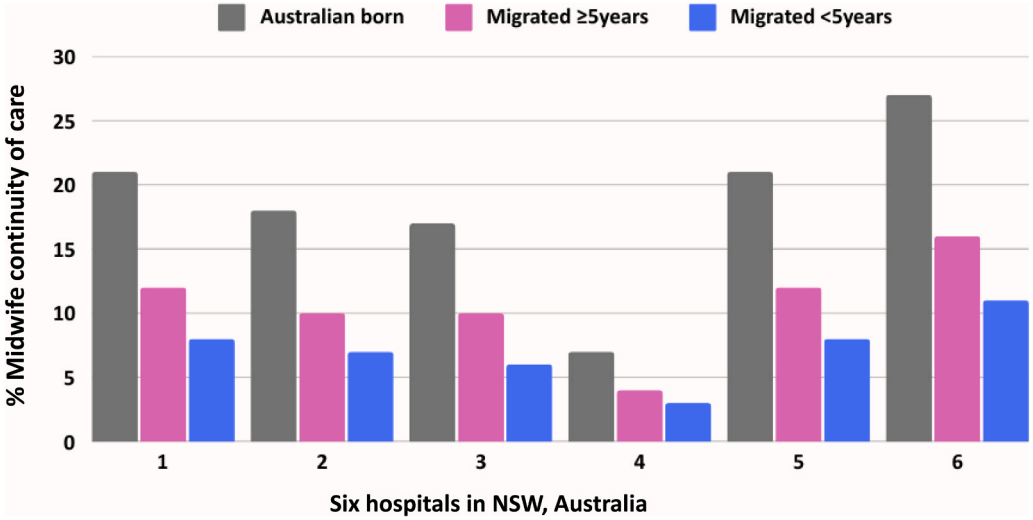


**Fig. 2.** Adjusted analysis of proportion of women receiving midwife continuity of care model by length of residency status and hospital. *At all hospitals the lowest proportion of women receiving midwife continuity of care was the new migrant group.*

**Table 2a**
Odds ratio of receiving midwife continuity of care total study cohort n = 48,240 (Migrants n = 21,875).

| | N | Unadjusted OR (95 % CI) | P | Adjusted OR (95 % CI) | P |
|---|---|---|---|---|---|
| Australian born | 26,365 | ref | | ref | |
| Migrated < 5 years | 6388 | 0.17 (0.16, 0.19) | < 0.01 | 0.30 (0.27,0.34) | < 0.01 |
| Migrated ≥ 5 years | 15,487 | 0.36 (0.34, 0.39) | < 0.01 | 0.51 (0.48, 0.56) | < 0.01 |

**Table 2b**
Odds ratio of receiving midwife continuity of care by ethnicity.

| Self-identified ethnic group | N | Unadjusted OR (95 % CI) | p | Adjusted OR (95 % CI) | p |
|---|---|---|---|---|---|
| Australian born | 26,365 | ref | | ref | |
| Southeast Asian | | | | | |
| Migrated < 5 years | 1061 | 0.17 (0.13, 0.22) | < 0.01 | 0.19 (0.15, 0.26) | < 0.01 |
| Migrated ≥ 5 years | 3944 | 0.37 (0.32, 0.44) | < 0.01 | 0.43 (0.36, 0.52) | < 0.01 |
| Middle Eastern | | | | | |
| Migrated < 5 years | 856 | 0.12 (0.08, 0.17) | < 0.01 | 0.22 (0.15, 0.34) | < 0.01 |
| Migrated ≥ 5 years | 1867 | 0.29 (0.23, 0.35) | < 0.01 | 0.32 (0.25, 0.40) | < 0.01 |
| South Asian | | | | | |
| Migrated < 5 years | 3274 | 0.24 (0.17, 0.35) | < 0.01 | 0.26 (0.17, 0.37) | < 0.01 |
| Migrated ≥ 5 years | 5076 | 0.40 (0.28, 0.56) | < 0.01 | 0.44 (0.31, 0.63) | < 0.01 |
| Pacific Peoples† | | | | | |
| Migrated < 5 years | 244 | 0.38 (0.19, 0.77) | 0.01 | 0.40 (0.19, 0.84) | 0.02 |
| Migrated ≥ 5 years | 1108 | 0.64 (0.45, 0.90) | 0.01 | 0.62 (0.19, 0.84) | 0.01 |
| White people | | | | | |
| Migrated < 5 years | 598 | 0.61 (0.50, 0.75) | < 0.01 | 0.56 (0.45, 0.69) | < 0.01 |
| Migrated ≥ 5 years | 2327 | 0.79 (0.71, 0.88) | < 0.01 | 0.72 (0.64, 0.80) | < 0.01 |
| Other | | | | | |
| Migrated < 5 years | 355 | 0.12 (0.07, 0.19) | < 0.01 | 0.10 (0.06, 0.16) | < 0.01 |
| Migrated ≥ 5 years | 1165 | 0.29 (0.23, 0.37) | < 0.01 | 0.25 (0.19, 0.32) | < 0.01 |

†Peoples of Polynesia, Micronesia, and Melanesia. Multivariant analysis adjusted for significant covariates: maternal age, hospital of booking, gestation at first comprehensive pregnancy medical visit, interpreter use, BMI, ethnicity, parity, area level socioeconomic status, EPDS and comorbidities: illicit drugs, alcohol in early pregnancy, smoking early pregnancy, prior gestational diabetes, chronic hypertension, prior pregnancy induced hypertension, prior preterm birth, prior caesarean section

not always discussed antenatally by a woman's doctor [53]. More than half (56 %) of those surveyed, stated the midwife continuity of care model was not discussed by their general practitioner [53]. Our results suggest that this may be even less for women who are migrants. However, tertiary care hospitals need to provide clear information to both the local population and primary care providers on the models of maternity care available and the intake pathway.

Our findings highlight the health system has failed to meet the health literacy needs of its culturally diverse population. Among all migrants irrespective of educational background, an inability to navigating a new health system is defined as having individual low heath literacy [37]. In pregnancy care low individual health literacy can result in poorer health outcomes for both the mother and her child [54]. Our research provides important information in understanding the health literacy needs of an equity deserving population and is crucial to improve perinatal outcomes. In high resourced settings, health literacy barriers for migrants accessing health services are recognised to be complex and multifactorial, including migrants experiencing discrimination, language barriers and cultural barriers [7,28,43,55]. We identified White migrants may have greater acculturation to the Australian health care system reflected by their higher level of access to this model of maternity care amongst the study migrant groups. The higher level of access for migrants who were White, may be due to the greater percentage of English spoken at home amongst this group than other migrant groups.

Our findings of variation of access between ethnic groups, confirm other research that identifies cultural groups have unique barriers and preferences to accessing health care that need to be investigated and addressed individually [43,51,55,56]. A Canadian study identified that in their research, Chinese women preferred obstetrician care over midwifery care [57]. These preferences and potentially the lack of knowledge of the benefits of midwifery care, may also underpin some of the difference between cultural groups in our findings.

The midwifery workforce may also impact access and availability of this model of care due to the global shortage of midwives possibly contributing to the general scarcity of this service. When a resource such

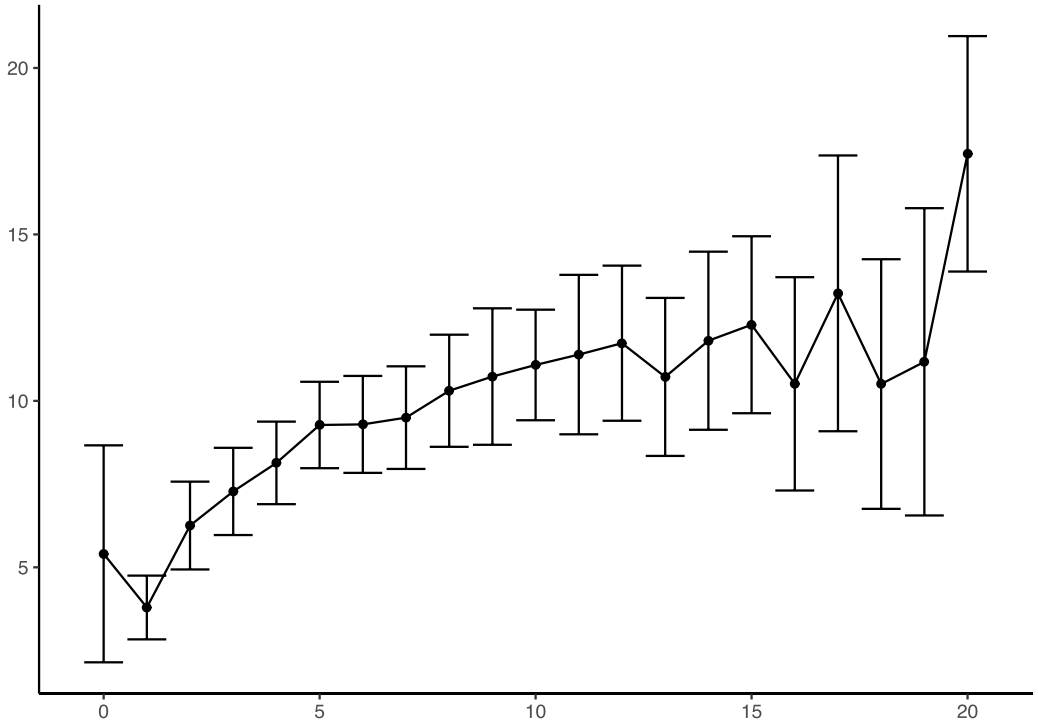


**Fig. 3.** Percentage chance (% CI) of receiving midwife continuity of care by years since migration.

as continuity of midwifery care is scarce, it is more vulnerable to being unequally distributed. It is important to note that in a stressed workforce environment, the system may not have capacity to measure or understand who is missing out. If midwife continuity of care was more readily available for all women, it follows, more migrants could access this model. The worldwide shortage of approximately 900,000 midwives will contribute to health sector pressures to meet the demand for midwife continuity of care [58]. Providing government incentives to both students as well as education providers to increase student midwifery numbers, may assist in addressing overall limited access to this service.

The importance of greater support for the midwifery workforce was highlighted in the recent NSW government select committee inquiry into birth trauma. They identified that reduced access to continuity of care was a significant contributing factor to poor mental health outcomes associated with women's birth trauma experiences [36]. One of the 43 committee recommendations was greater investment and expansion of midwife continuity of care models to improve pregnancy outcomes [36]. This will mean greater investment in the midwifery workforce and education. Continuity of midwifery care models that provide trauma informed care and is culturally responsive, will benefit not only the migrant population but also our culturally diverse population of both Australian–born women and our diverse midwifery workforce.

The impact of reduced access to midwife continuity of care on migrant women's long-term health as well as the cost to the health care system, also needs to be considered. The migrant population in our study were more likely to be nulliparous. Midwife continuity of care reduces the risk of caesarean birth [25]. Increasing the odds of a primary caesarean birth for nulliparous women is a significant public health issue. Maternal morbidity associated with caesarean birth and consequential financial burden on the health care system, should be considered as an incentive to improve equity of access for women who are migrants to midwife continuity of care. Furthermore, this model of care has been shown to be cost-efficient [26]. Reducing access to an equity deserving population is a public health issue and a financial burden to the health sector. Globally there is very little evidence that targeted midwifery-led services are available to migrant and refugee women and this targeted service may be a solution to reduced access [59]. There is evidence for the acceptability and improved perinatal outcomes of such a dedicated community-based midwifery service in Australia for refugee women [29,41]. These important investigations can provide foundational knowledge for other services and potentially expansion to serve women who are migrants.

The potential first contact with our health system for a migrant woman and her family, may be vital for trust and confidence in care within the health sector. Establishing a trusting relationship through midwife continuity of care with a known care provider, was identified as important to migrant women in a recent systematic review [43]. Continuity of midwifery care has been identified as important for all women's satisfaction with care [25]. It is recognised as particularly important for women who are migrants to have a trusted person to navigate a complex unfamiliar health system with continuity relational care contributing to confidence and higher likelihood to attend appointments [6]. Also, there is an increased likelihood the midwife in a continuity of care model, will be able to individualise needs and cultural concerns through building a trusted relationship [40].

Identifying how to meet the needs of migrant women may be with standardised markers of quality. Murray et al. have identified quality markers for equity in maternity care that may be useful to document equity progress, particularly in high migrant areas [60]. Many of these markers are routinely collected in the Australian health system and could therefore be reported with an equity lens. These markers include percentage of equity deserving groups who birth and were 'booked' before 12 weeks gestation, identification of language needs, interpreter services provided, women with high BMI who are assessed and referred as appropriate, documentation of domestic violence and smoking assessment [60]. Murray et al. also recommended that a marker for equity metrics includes documentation of the percentage of women who receive continuity of care [60]. These additional markers could be added to our routine data collection for migrants together with duration since migration and reported nationally.

There are calls for greater racial diversity in research as well as initiatives to effectively reduce inequalities in maternity and reproductive health [11,19]. Our findings highlight the need for not only racial

diversity in research, but also more transparency regarding migrancy status or refugee status in maternity routinely collected data. This would inform research and auditing to understand and meet the needs of a migrant population. Research and auditing data can highlight barriers to equity in maternity care, as well as reveal underlying social determinants of maternal health and potential ways to address structural racism within our system.

Our findings highlight equal access does not mean equity of access to care. It is incumbent on the health care service to raise the equity ladder to ensure not just equality but equity. Service improvements have commenced in the hospitals where the research was conducted and includes audit/feedback to safety and quality meetings on migrant access to continuity of care, modification of the intake procedure to highlight recency of migration and posters to encourage referrals of migrants to midwife continuity of care at any gestation. Ongoing negotiation with primary care providers through newsletters and seminars to encourage early referrals to tertiary care are underway. However, qualitative research is required to better elucidate individual cultural preferences and barriers to access the model. Codesign principles should be utilised to design and pilot community information on access pathways, mitigating measures to address structural racism and optimising messaging the benefits of midwife continuity of care.

### *4.1. Strengths and limitations*

Strengths of the study include the large cohort size over varied sociodemographic areas with high levels of a migrant population. Another strength is the ability to adjust for a variety of confounding factors.

Limitations of the study include the absence of rural or remote sites in the study hospitals. Smaller communities may have less complexity for entry and offer improved transparency on models of care offered with greater access. The study period included COVID-19 restrictions, with the impact of changes in service provision and on the participants is unknown over this shorter period of time and is a limitation. Some important variables are absent in our routine data, such as education level and level of English proficiency. Understanding the needs of refugee women is particularly difficult as disaggregation of their data is not possible in the study hospitals routine data and is a limitation of this research. Refugee status is not a variable in routine data at any public hospital in the state of New South Wales. However, most childbearing aged (aged 20–44) migrants are permanent residents who enter Australia under either the family or the skilled migrant stream with humanitarian migrants accounting for only 8 % of this group [61].

## 5. Conclusion

Women who are migrants had less access to midwife continuity of care compared to Australian born women, particularly new migrants unless the migrant was White. Duration of residency in a host country is not a variable available in all healthcare service data, consideration should be given to including this information in routine national data collection. Benchmarking access to models of maternity care between service providers is essential to ensure equity of access and address barriers in a timely manner. Sociocultural barriers that contribute to disparities in health outcomes for ethnic minority groups is compounded for new migrants attempting to navigate the complex maternity care system. System level improvements are urgently needed to address migrants' health literacy and maternity care needs and provide mitigating interventions to ensure equity of access to midwife continuity of care. Safe quality maternity care must include equity.

## Author agreement

The authors listed on this research agree this manuscript is original work and has not received prior publication or under consideration by any other journal. All authors have seen and approved the manuscript and this submission. All authors abide by the copyright terms and conditions of Elsevier and the Australian College of Midwives

## Ethical statement

Western Sydney Local Health District Human Research and Ethics Committee approval was granted for this research on May 3, 2023 (2022/ETH02685).

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## Conflict of interest

All authors declare they have no conflicts of interest for the research presented in this manuscript.

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## Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.wombi.2025.101918.

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