Counting culturally and linguistically diverse (CALD) children in Australian health research: Does it matter how we count?

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Abstract

Objective: To describe how culturally and linguistically diverse (CALD) children are identified and enumerated in routine data collections and in child health research in Australia.

Methods: Descriptive analysis, where different definitions of CALD were applied to the 2021 Australian Census to measure the size of the CALD population of Australian children aged 0 to 17 years. Narrative review of the Australian child health literature to examine how CALD children were defined.

Results: Applying various definitions to the 2021 Census, the estimated proportion of CALD children aged 0 to 17 ranged from 6.3% to 43%. The most commonly applied CALD indicators were language background other than English and being born overseas.

Conclusions: There is no consensus on how CALD is defined in Australian child health research. Application of different CALD indicators can generate up to seven-fold differences in estimates of who counts as being a CALD child.

Implications for Public Health: If we are to advance health and well-being equity for CALD children, we need a more consistent approach to understanding which children are counted as CALD.

Key words: culturally and linguistically diverse, ethnic groups, migrants, racism, minority health

Introduction

Twenty-first century Australia is claimed to be one of the most multicultural societies in the world. However, diversity brought about by waves of immigration has not always been celebrated. Australian history can be characterised by the mainstream Anglo population's domination over groups perceived as 'others'.[1] This domination was achieved through discriminatory policies and practices beginning with colonial governments and was justified by racist ideology. These ethno-cultural 'others' refer to ethnic or cultural groups perceived as different from mainstream Anglo-Celtic Australians. One of the more recent manifestations of this desire to describe the 'other' is through the concept of culturally and linguistically diverse (CALD) populations. CALD is a concept unique to Australia. CALD refers to Australians who are not of the mainstream English-speaking Anglo-Celtic group and are not Aboriginal or Torres Strait Islanders. Although Aboriginal and Torres Strait Islander people are diverse in language and customs, they occupy a unique historical and contemporary position as First Australians,[2] and therefore should be considered distinct from the CALD population.

Counting CALD children, including those of refugee and asylum seeker backgrounds, is important and has been identified as a priority population in the *National Action Plan for the Health of Children and Young People 2020-2030* by the Australian government.[3] The health and wellbeing experiences of this group can differ from mainstream experiences. Such inequities in child health and wellbeing are driven by fundamental social, political and economic factors such as racial discrimination, socioeconomic disadvantage and limited access to health services.[4] We cannot begin to understand the characteristics and extent of health inequities experienced by CALD children if we cannot consistently identify and enumerate them in the data collected for health system and research purposes. Identification and enumeration of CALD children is required to inform the development of policies and appropriate service delivery to better meet their health

and wellbeing needs and improve equity. However, difficulties in identifying and enumerating CALD complicate the endeavour to better understand the health experiences of CALD children. A recent publication by the Federation of Ethnic Communities Councils of Australia (FECCA), the national peak body representing CALD peoples, highlights this issue of concern at the national level.[5] FECCA advocates for comprehensive and consistent data collection and reporting on cultural and linguistic diversity in administrative datasets, general population surveys, and health and medical research.[5] In 2022, the Federal Minister for Immigration, Citizenship, Migrant Services and Multicultural Affairs announced the Australian Government would begin collecting ethnicity data.[6]

Background to recording of ethnicity in Australia

In the first half of the 1900s, enumeration in Australia occurred in the form of racial classification.[7] 'Race' or 'racial origin' was recorded from the first Australian census in 1911 through 1976. Recording was initially driven by the White Australia policy (1901–1966) to enumerate people of non-European and partly non-European descent and distinguish them from the White, European or British populations.[8–10] This discriminatory policy was embedded in racist doctrines upheld by the colonial government, which also declared Australia as *terra nullius,* disregarding the rights, laws and customs of Aboriginal and Torres Strait Islander peoples as the first inhabitants of the land.[11] Data collection methods have predominantly moved away from racial classifications, but in some jurisdictions, such as Western Australia and, until recently, South Australia, 'race' was still recorded as a category in routinely collected perinatal statistics.[12,13]

By the 1970s, the White Australia policy was repealed and replaced by multiculturalism with underlying principles of access, equity and participation.[14] For the first time in Australia, a policy framework was established to meet the needs of immigrants of diverse backgrounds.[15] Accompanying this change, data items like parental place of birth, language spoken, ancestry, and English proficiency were introduced in the Census which enabled the enumeration of diverse groups to inform anti-discrimination policies.[8] The 1986 Population Census Ethnicity Committee endorsed the UK Law Lord's definition of ethnicity, which formed the basis of the Australian Standard Classification of Cultural and Ethnic Groups (ASCCEG).[16] Characteristics that could be considered in this definition of ethnicity were a distinct shared history, cultural tradition, geographic origin, language, literature, religion, minority status and being racially visible.[16] The ASCCEG forms the classification for coding ancestries identified by Census respondents. When used in combination with other information such as country of birth and parental country of birth, ancestry information may provide an indication of the respondents' ethnicity.[17]

Despite the policy of multiculturalism, Australia's national identity has remained focussed on British heritage. A concept used to describe non-British people in Australia in the 1980s and 1990s was 'non-English speaking background' (NESB).[18] Limited information is available on how this indicator was collected and determined. Although not widely used now, remnants can still be found. For example, the Australian Public Service Commission website in 2017 described NESB as including characteristics about the first language spoken, the country of birth and the language spoken by the person's parents.[19] NESB was criticised as it did not distinguish between disadvantaged populations or various cultural and linguistic groups in Australia.[20]

The concept of culturally and linguistically diverse

In 1996, the Ministerial Council of Immigration and Multicultural Affairs recommended that the term NESB be replaced by CALD.[20,21] Following extensive consultation, the Australian Bureau of Statistics (ABS) developed 'Standards for Statistics on Cultural and Language Diversity' that recognised the multidimensional aspects of ethnicity. These standards include a minimum set of four core indicators: country of birth, main language other than English spoken at home, proficiency in spoken English, and whether the person is Aboriginal or Torres Strait Islander (as stated, Aboriginal and Torres Strait Islander peoples are not considered CALD peoples). Additional variables that may be included in this standard are ancestry based on geographic origins or common social and cultural characteristics shared by a group of people,[22] country of birth of father and mother, first language spoken, languages spoken at home, main language spoken at home, religious affiliation, and year of arrival to Australia.[20,23]

Despite declaring this a 'standard', the ABS provides no clear definition of the concept of CALD outside of four "core" and eight "additional" indicators. There is no specification of how these variables should be used or combined.[23] At the same time, the ABS stipulates that no single indicator would accurately synthesise the different cultural and linguistic characteristics of an individual or a group of people (p. 2).[23] In the absence of an official definition, organisations that have reported on CALD people have determined their own indicator(s). Unsurprisingly, these definitions differ but largely revolve around English language use. A non-exhaustive list of example definitions used by organisations is in Table S1.

Australia's approach to census data collection of ethnicity differs from other predominantly Anglo-Celtic countries such as the UK, Ireland, New Zealand, the USA and Canada.[24] All these countries permit the self-declaration of more than one option to enable census ethnicity data collection in a sensitive way, as stipulated by the United Nations.[25] All five countries have a direct question on race or ethnicity, with response categories dominated by phenotypic features, geographic region of origin or cultural similarities, e.g. White, Black/African/Caribbean, Asian, Mixed in UK and Ireland[26–28]; White, Black/African American, Asian, American Indian/Alaskan Native, Native Hawaiian or Other Pacific Islander in the USA[29,30]; European, Maori, and Asian[31] in New Zealand and White, Black, West Asian and Latin American[32] in Canada. Countries also collect supplementary information where respondents nominate one or more ethnic groups, e.g. Greek, Vietnamese.[32,33]

Except for the USA, all countries include other indicators of ethno-cultural diversity in their censuses. Information collected in New Zealand, Ireland, the UK and Canada, like Australia, includes the person's country of birth, languages spoken other than English (and French in Canada), English proficiency, and religious affiliation. Canada's data collection standards for population diversity are the most comprehensive, as they also include immigration details for permanent residents and various identifications for Aboriginal and First Nation communities.[34] The census collections within these countries recognise the complexity of characterising cultural and language diversity and its' evolving nature in the context of migration

and acculturation. As such, there is an increasing use of a composite of indicators to canvas ethno-cultural diversity.

The approach to enumerate the ethno-cultural 'other' in Australia has transitioned from one driven by racist ideology to one that aims to highlight diversity and promote inclusivity. Although there are statistical "guides" for collecting information on elements of cultural and language diversity, there is no specification on how these standards should be applied to determine the CALD population. Our objective in this study is to describe how using different CALD indicators identifies different populations of CALD children. We use data from the ABS 2021 National Census of Population and Housing and the Australian Census to estimate the proportion of children in Australia who might be considered CALD using different indicators. We also provide a narrative literature review examining how the term CALD has been defined and applied in child health research in Australia.

Methods

First, we explored how different definitions of CALD affect the size of the CALD population of Australian children aged 0 to 17 years using the 2021 ABS Census of Population and Housing. Second, we reviewed the Australian child health research literature from 1996 (the year of the introduction of the term CALD) to 2022 to explore how CALD has been used.

The 2021 Census includes all people in Australia, including visitors, and excludes foreign diplomats and their families and Australian residents overseas on Census night.[34]

Descriptive analysis was conducted using TableBuilder Pro which is publicly available following application to the ABS. The 2021 Census data counting persons and place of usual residence was used for ages 0 to 17 years in 5-year age groups. Cultural and language diversity variables such as country of birth, Indigenous identification, language spoken at home, and spoken English proficiency were used to estimate the CALD population using different definitions.

For the narrative review, we conducted a literature search on *PubMed* and *Web of Science* using the terms 'CALD' or 'culturally and linguistically diverse', and 'children', and 'health' or 'wellbeing' and 'Australia', limiting it to publications from 1996 to 2022. We excluded articles where the subject matter concerned adults, health care workers, descriptions of study protocols, studies limited to Aboriginal communities, studies external to Australia, and narrative and scoping reviews.

Results

Culturally and linguistically diverse children in the Australian 2021 Census

Table 1 presents the estimated size of CALD and non-CALD child populations in Australia according to various CALD definitions. In 2021, there were 5,524,693 children aged 0 to 17 years in Australia. Based on the four definitions of CALD outlined in Table 1, the estimated proportion of CALD children in Australia in 2021 ranged from 6.3% (for Australian Institute of Health and Welfare (AIHW) indicators) to 43.1% for the Department of Social Services indicators. A definition based only on country of birth yielded an estimate of 6.3%. Definitions based only on country of birth were utilised by the AIHW and FECCA in reports on the aged care needs of older CALD

Australians. Applying this definition resulted in a potential undercount of children born in Australia who may identify as CALD in other ways, such as by speaking a language other than English at home.

The use of multiple indicators increases the proportion of children identified as CALD. When the CALD definition by the Department of Social Services and Office of Multicultural Interests was applied, the proportion of CALD children in Australia was 43.1%. Here, CALD children were those who were non-Aboriginal or Torres Strait Islander, spoke English and another language, and whose ancestries excluded Australian, New Zealander, British, Irish, American or Canadian, either as a single ancestry or as combinations of these. We also applied a combination of the ABS CALD standard's four core variables, which resulted in CALD children comprising 20.4% of children aged 0 to 17 years in Australia in 2021. As the ABS does not specify how standards on country of birth and English language proficiency identified CALD, we determined CALD children as non-Aboriginal or Torres Strait Islander, spoke a language other than English at home, were born in any country, and reported any level of English proficiency.

Narrative review of the child health literature use of culturally and linguistically diverse

Forty of the 41 articles included that used the term CALD were published from 2010 onwards. There is no consensus on a definition of CALD among these publications. Publications mostly used ABS standards to identify CALD. Two publications using the same study cohort deployed different definitions. (studies 1 and 2 in Table S2) Eleven of the 41 publications used 'language spoken other than English' or 'main language other than English spoken at home' as the indicator for CALD. Two studies used non-ABS standard language indicators: 'preferred language is not English'[35] and 'language background other than English'.[36] CALD children or families represented between 11% and 68.9% of the participants in these studies. Twelve of 41 publications used language variously combined with child or parental country of birth, English proficiency, length of stay in Australia, religion, interpreter use, and visa type (distinguishing migrant from refugee). Except for one, these publications reported the number of CALD participants for each variable used rather than creating a composite variable identifying CALD. The proportion of CALD participants ranged from 1.5% to 74%. Ten studies purposefully sampled specific CALD groups by ethnicity, e.g. Chinese Australian, or recruited migrant or refugee children attending English language schools. These publications used 'cultural group' or 'background' which, along with visa type, are not consistent with ABS CALD standards. A publication list of how CALD was defined and the proportion of CALD participants is available in Table S2.

A review of the collection of indicators of ethnicity and cultural diversity used in the Australian health system reveals variation in data collection.[37] National data dictionaries for the health, community services and housing assistance sectors endorse cultural and language diversity information standards as stipulated by the AIHW.[37] However, national minimum dataset specifications, national health data collection structures, and national surveys do not consistently apply the minimum core of the ABS Standards on Cultural and Language Diversity in collecting data on ethno-cultural characteristics.[37] In the health sector, there is emphasis on country of birth and language spoken, as well as a preference for information

Definition used by		Total		Age							
				0 to 4 years		5 to 9 years		10 to 14 years		15 to 17 years	
		n	%	n	%	n	%	n	%	n	%
Australian Institute of Health and Welfare (AIHW)	*CALD 1 (i) - Born in a <u>non-MESC</u> and not Aboriginal and/or Torres Strait Islander*										
	Non-CALD	4,923,120	93.7	1,369,428	98.0	1,408,073	93.5	1,385,213	91.8	760,450	90.0
	CALD	333,187	6.3	27,382	2.0	97,524	6.5	123,751	8.2	84,700	10.0
	Total[a]	**5,256,307**	**100.0**	**1,396,810**	**100.0**	**1,505,597**	**100.0**	**1,508,964**	**100.0**	**845,150**	**100.0**
	CALD 1 (ii) - Born in a MESC and not Aboriginal and/or Torres Strait Islander and speaks a language other than English at home.										
	Non-CALD	3,746,138	82.4	957,815	77.7	1,054,432	80.2	1,107,888	85.8	626,008	88.3
	CALD	800,810	17.6	275,463	22.3	259,537	19.8	182,818	14.2	82,973	11.7
	Total[b]	**4,546,948**	**100.0**	**1,233,278**	**100.0**	**1,313,969**	**100.0**	**1,290,706**	**100.0**	**708,981**	**100.0**
	CALD 1 (iii) - Non-Aboriginal and/or Torres Strait Islander and born in non-MESC or born in a MESC and speaks a language other than English at home.										
	Non-CALD	4,067,443	78.1	1,045,117	77.5	1,145,228	76.2	1,200,422	79.6	676,744	80.1
	CALD	1,137,942	21.9	303,780	22.5	358,216	23.8	307,707	20.4	168,390	19.9
	Total[c]	**5,205,385**	**100.0**	**1,348,897**	**100.0**	**1,503,444**	**100.0**	**1,508,129**	**100.0**	**845,134**	**100.0**
Federation of Ethnic Communities Council of Australia (FECCA)[f]	*CALD 2 - Non-Aboriginal and/or Torres Strait Islander and born in a non-MESC excluding South Africa*										
	Non-CALD	4,906,042	93.3	1,368,371	98.0	1,403,938	93.2	1,378,649	91.4	755,159	89.4
	CALD	350,265	6.7	28,437	2.0	101,685	6.8	130,318	8.6	89,986	10.6
	Total[a]	**5,256,307**	**100.0**	**1,396,808**	**100**	**1,505,623**	**100.0**	**1,508,967**	**100.0**	**845,145**	**100.0**
Department of Social Services & Office of Multicultural Interests (Western Australia)	*CALD 3 - Non-Aboriginal and/or Torres Strait Islander and not from an English-speaking, Anglo-Celtic[a] background*										
	Non-CALD	2,945,187	56.9	752,680	55.0	823,323	55.6	872,475	58.6	496,722	59.5
	CALD	2,227,107	43.1	615,180	45.0	657,297	44.4	615,972	41.4	338,674	40.5
	Total[d]	**5,172,294**	**100.0**	**1,367,860**	**100.0**	**1,480,620**	**100.0**	**1,488,447**	**100.0**	**835,396**	**100.0**
'Core variables' of CALD standards by the Australian Bureau of Statistics	*CALD 4 - Non-Aboriginal and/or Torres Strait Islander and speaks a language other than English at home*										
	Non-CALD	4,140,420	79.6	1,051,538	78.0	1,167,553	77.7	1,227,507	81.4	693,928	82.1
	CALD	1,062,583	20.4	295,968	22.0	335,521	22.3	280,240	18.6	150,938	17.9
	Total[e]	**5,172,294**	**100.0**	**1,347,506**	**100.0**	**1,503,074**	**100.0**	**1,507,747**	**100.0**	**844,866**	**100.0**

Table 1: Number and percentage of children (0–17 years) according to different definitions of CALD using 2021 Australian Census of Population and Housing data (n=5,524,693).

CALD = culturally and linguistically diverse.

MESC: The main English-speaking country, includes the following countries: Australia, Norfolk Island, Australian External Territories, New Zealand, United Kingdom, Channel Islands and Isle of Man, nfd, England, Isle of Man, Northern Ireland, Scotland, Wales, Guernsey, Jersey, Ireland, Canada, United States of America, & South Africa.

[a]Population includes children age 0 to 17 years in the 2021 ABS Census, and weren't missing information on Aboriginal and/or Torres Strait Islander or country of birth n=5,256,307. Excludes children missing information on Aboriginal and/or Torres Strait Islander and country of birth n=268,386.

[b]Population includes non-Aboriginal and/or Torres Strait Islander children aged 0 to 17 years in the 2021 ABS Census who were born in MESC and weren't missing information on COB or language spoken at home n=4,546,948. It excludes children missing information on language spoken at home n=61,269.

[c]Population includes children age 0 to 17 years in the 2021 ABS Census, and weren't missing information on Aboriginal and/or Torres Strait Islander, COB and/or language spoken at home n=5,205,385. It excludes children missing information on Aboriginal and/or Torres Strait Islander, COB and/or language spoken at home n=319,308.

[d]Population includes children age 0 to 17 years in the 2021 ABS Census, and weren't missing information on Aboriginal and/or Torres Strait Islander and ancestry n=5,172,294. It excludes children missing information on Aboriginal and/or Torres Strait Islander and ancestry n=352,692.

[e]Population includes children age 0 to 17 years in the 2021 ABS Census who weren't missing information on Aboriginal and/or Torres Strait Islander or language spoken at home n=5,203,003. It excludes children missing information on Aboriginal and/or Torres Strait Islander and language spoken at home n=321,690.

[f]FECCA does not specify which countries are non-English-speaking therefore, this has been interpreted to exclude South Africa, where the Anglo-Celtic community constitutes a minority of the population.

[g]Includes categories of ancestry: Australian, New Zealander, British, Irish, American and Canadian. Respondents who nominated a single ancestry or dual ancestry comprising a combination of these categories were considered Anglo-Celtic.

that supports service provision, such as the need for an interpreter and preferred language.[37,38]

Discussion

CALD, a concept unique to Australia, is intended to canvas the ethno-cultural diversity of the population. However, despite its official position in Australian population enumeration methods, the usefulness of this concept in describing ethno-cultural characteristics remains unclear. CALD in itself is necessarily a partial concept, as the complexities of human groupings cannot be exhaustively captured nor clearly categorised by statistical criteria. We have demonstrated the difficulties of operationalising this complex concept based on recommended standards. Depending on the definition used, the estimated proportion of CALD children ranged from 6.3% to 43.1% of the total population of Australian children aged 0 to 17 years. If minimal information is used to identify CALD (e.g. country of birth only), there is potential for undercounting CALD children; our estimate from the Census indicated a lower bound of 6%. Using four core ABS indicators, 20.4% of children aged 0–17 in Australia were CALD.

The lack of consistency in defining CALD is mirrored in the child health research literature. Studies mainly used single variables to identify CALD. If multiple indicators were used, the proportion of children identified with CALD characteristics would be reported for each item rather than as a composite. The proportion of CALD children between studies is not comparable due to the variation in sample sizes and study populations. These populations range from purposeful sampling of language school students to all attendances at a paediatric tertiary hospital, with 68% of all studies involving convenience samples. If CALD children are a 'priority' population group,[3] it is imperative that they are well identified in health research and administrative datasets to inform improved, equitable service delivery. 'Priority' populations "… are especially prone to health inequity as a result of social, geographical and other determinants" (p. 8); and for CALD children, these may include cultural barriers to accessing health services.[3] Additionally, traumatic experiences that occur pre-settlement may have a significant impact on the physical and mental health of refugee children.[3] How CALD is enumerated affects estimates of the population, which, in turn, may bias estimates quantifying the health issues of interest in CALD communities. Although there is no single correct way to define CALD, consistency in enumerating this population contributes to improving the quality of evidence generated that informs health policies and services developed to meet the needs of this priority population.

We propose several points for consideration for the use of the concept of CALD in child health research in Australia. First, it is possible for a self-identifier item for CALD to be included in the data collection, similar to the items routinely collected for Aboriginal and Torres Strait Islander Australians. This is recommended by FECCA[5] to support consistency in data collection, which would require national consultation in its development. Second, researchers should utilise the ABS standards on CALD, as they provide a consistent method of collecting and statistically categorising information. Studies examining CALD children using specially designed datasets should ensure data collection includes the four core ABS standards and parental country of birth at the minimum. Similarly, health administrative data collections used to inform research and service

provision should align with these standards. One exception to this is research on racial discrimination, where CALD standards may not be fit for use and information indicating groups that have been 'racialised' may be more appropriate.[39] As an example, the Canadian concept of 'visible minority' may better encapsulate the experience of racism. The *Employment Equity Act* in Canada defines visible minorities as 'persons, other than Aboriginal persons, who are non-Caucasian in race or non-white in colour' and specifically consist of South Asian, Chinese, Black, Filipino, Latin American, Arab, South-east Asian, West Asian, Korean and Japanese.[40] Consultation at the national level is required to construct such a data item to ensure consistency. Third, using multiple indicators improves the identification of CALD, as single indicators provide a limited view of this heterogeneous group. This has similarly been recommended by Pham et al.[41] We have demonstrated that using only country of birth resulted in a small proportion of children who were CALD in the census, as many were born in Australia. Similarly, using 'language spoken' only may misclassify predominantly English-speaking CALD children as non-CALD.

Identifying subgroups with greater need is crucial to progressive proportionate universal approaches for service delivery at the population level.[4] It is important to examine the magnitude of health disparities within various subgroups of CALD. The patterning of health conditions may be similar to non-CALD groups for certain subgroups of CALD and not for others. For example, an AIHW report on selected health indicators in the CALD adult population demonstrated subgroup variation in age-standardised mortality rates and the presence of chronic conditions, which were masked when a binary indicator of CALD was used.[42] Study analysis should be extended to assess the patterns of health outcomes of interest according to meaningful subcategories of CALD, contingent on the research question. For example, a study on health literacy may assess CALD subgroups according to English language proficiency and year of arrival in Australia, which may indicate ability to develop local health literacy. Conversely, a study examining the mental health impact of racial discrimination would assess subgroups according to parental country of birth as a proxy for the concept of visible minority, as demonstrated by Priest et al.[43] In determining subgroups for analysis, researchers should be specific,[44] and avoid categories that could potentially stigmatise or perpetuate stereotypes. If subcategories contain very small numbers, which potentially risk participant identification, data should not be reported, but this issue should be noted.[44] Lastly, data collection should routinely include an indicator for refugees or asylum seekers to identify this highly vulnerable CALD subpopulation. The points outlined above aspire towards a more consistent approach to best ascertain CALD children in Australian health research.

Notwithstanding complexities in operationalising the concept of CALD and what may be seen as pragmatic difficulties in including multiple questions to reflect the multiple dimensions of the CALD concept, health and well-being inequities exist among people not belonging to the mainstream non-Indigenous population in Australia. If we want to understand and reduce those inequities, then we need to be able to identify which groups experience those inequities. Although studies that use the term CALD adhere to the ABS standards on cultural and language diversity to varying degrees, the overall approach to ascertaining CALD children is inconsistent. As such, there can be large variation in the estimated size of the CALD child

population, which in turn will impact estimates of the health outcomes of interest and the inequities in those outcomes. If CALD children are indeed a priority population in the national action plan, we need frameworks to ensure a consistent approach to identifying these children in Australian health research. Although we cannot capture all the ways in which we are ethno-culturally different, we can certainly do better.

Conflicts of interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Ethical Approval

The project was exempted from formal ethical review by the University of Adelaide Human Research Ethics Committee due to the use of publicly available, non-identifiable data held by the ABS, which involved negligible risk to participants.

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Appendix A Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.anzjph.2024.100129.