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Socioeconomic disadvantage and referral to pain management services in Australasia

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Abstract

This paper aims to examine the relative socioeconomic disadvantage of people seeking specialist pain management in Australasia, specifically, whether socioeconomic disadvantage influences access to pain management services and impacts symptom severity at referral.

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Background

The electronic Persistent Pain Outcomes Collaboration (ePPOC) is an Australasian initiative which aims to improve services and outcomes for people experiencing persistent pain. It is an initiative of the Faculty of Pain Medicine and was established in 2013 with funding from the NSW Ministry of Health.

The key functions of ePPOC are to:

- facilitate the collection of standardised data from pain management services
- analyse and report these data to participating pain services, stakeholders and the broader community
- use the data for benchmarking and quality improvement
- promote research into areas of importance in pain management.

While ePPOC has been developed for adults experiencing persistent pain, PaedePPOC addresses the differing requirements of the paediatric pain management sector, supporting the collection of data items and assessment tools specific to the needs of children, adolescents and their carers.

Further details regarding the establishment of ePPOC[1] and PaedePPOC[2] and the assessment tools used have been published and are available on the ePPOC website at https://ahsri.uow.edu.au/eppoc

Aims

This paper aims to examine the relative socioeconomic disadvantage of people seeking specialist pain management in Australasia, specifically, whether socioeconomic disadvantage influences access to pain management services and impacts symptom severity at referral.

Methods

Episodes of pain management where a referral questionnaire was received during the period January 2014 to December 2018 were included in the analysis. Sixty-eight adult and nine paediatric pain services contributed data. Twenty-two services were based in New Zealand and 55 in Australia.

Socioeconomic disadvantage measures were assigned based on information provided at referral to a pain management service. For referrals to New Zealand pain services, patient residential address was geocoded to the New Zealand Index of Relative Socioeconomic Deprivation (NZDep2013)[3]. Referrals to Australian pain management services were coded to the Socio-Economic Index for Areas – Index of Relative Disadvantage (SEIFA-IRSD 2016)[4]. This index was chosen from the four socioeconomic advantage and disadvantage indices produced by the Australian Bureau of Statistics, as it most closely approximates the NZDep2013. Further information on the process of geocoding patient addresses can be found in Appendix A.

Both the SEIFA-IRDS and NZDep2013 provide an area deprivation score, scaled to have a mean of 1000 and standard deviation of 100. These scores can also be shown as quantiles such as deciles or quintiles. This study used quintile scores, which range from 1 to 5 with each quintile representing approximately 20% of the national population, such that 20% of the population live in the most disadvantaged areas and 20% in the least disadvantaged.

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[1] Tardif H, Arnold C, Hayes C and Eagar K (2017). "Establishment of the Australasian Electronic Persistent Pain Outcomes Collaboration". Pain Medicine 18(6): 1007-1018.

[2] Lord S, Tardif H, Kepreotes E, Blanchard M and Eagar K (2019). "The Paediatric electronic Persistent Pain Outcomes Collaboration: establishment of a binational system for benchmarking children's persistent pain services". Pain 160(7): 1572-1585

[3] www.health.govt.nz/publication/nzdep2013-index-deprivation

[4] http://www.abs.gov.au/ausstats/abs@.nsf/Lookup/by%20Subject/2033.0.55.001~2016~Main%20Features~IRSD~19

High values in the SEIFA-IRDS indicate areas of lowest disadvantage, whereas high scores in NZDep2013 indicate areas of highest deprivation. For this study, in order to allow comparison between the two countries, quintiles are shown with SEIFA-IRDS values reversed, such that high quintiles in both indices reflect areas of higher disadvantage.

Results

In total, 68,949 episodes were included in the analysis. Of these, 67,410 patients were referred to adult pain management services, and 1,539 to paediatric services. SEIFA-IRDS or NZDep2013 scores could not be assigned to 6,233 records (9.0%). The majority of these records (90.3%) had no postcode attached to the episode, with the remainder including postcodes for which a SEIFA-IRDS or NZDep2013 score could not be assigned.

Figure 1 shows the proportion of people in each socioeconomic category, and compares the Australasian general population to the population of people referred to:

- Australian and New Zealand pain services
- Adult and paediatric services.

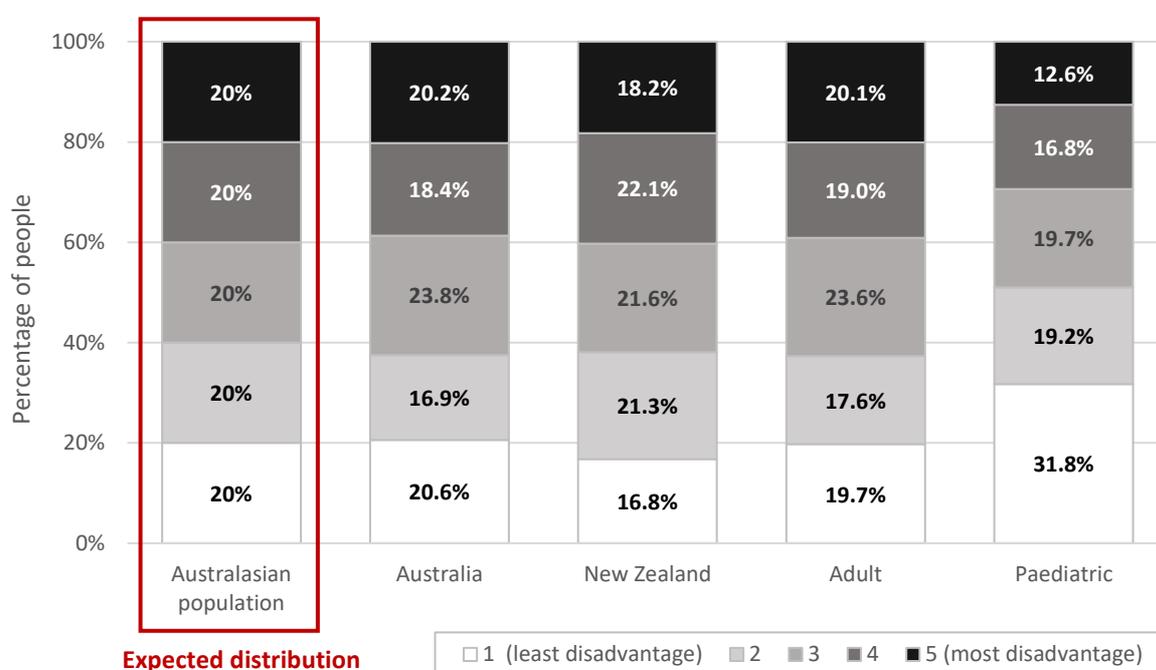**Figure 1. Referrals by socioeconomic group**

Figure 1 suggests that, in general, people residing in the highest and lowest socioeconomically disadvantaged areas of Australia and New Zealand were equally likely to be referred for specialist pain management. In New Zealand, people who live in the areas of highest and lowest disadvantage were **less** likely to be referred compared to people living in other areas. Patients referred for specialist paediatric pain management were most likely to reside in areas of least disadvantage.

The proportion of people living in disadvantaged areas differed considerably across individual pain services. This is shown in Figure 2, with one pain service reporting no referrals for people residing in areas of most disadvantage, while for another, 75% of referrals were for patients living in the most disadvantaged areas.

Figure 2. Patients living in the most disadvantaged areas, by pain service
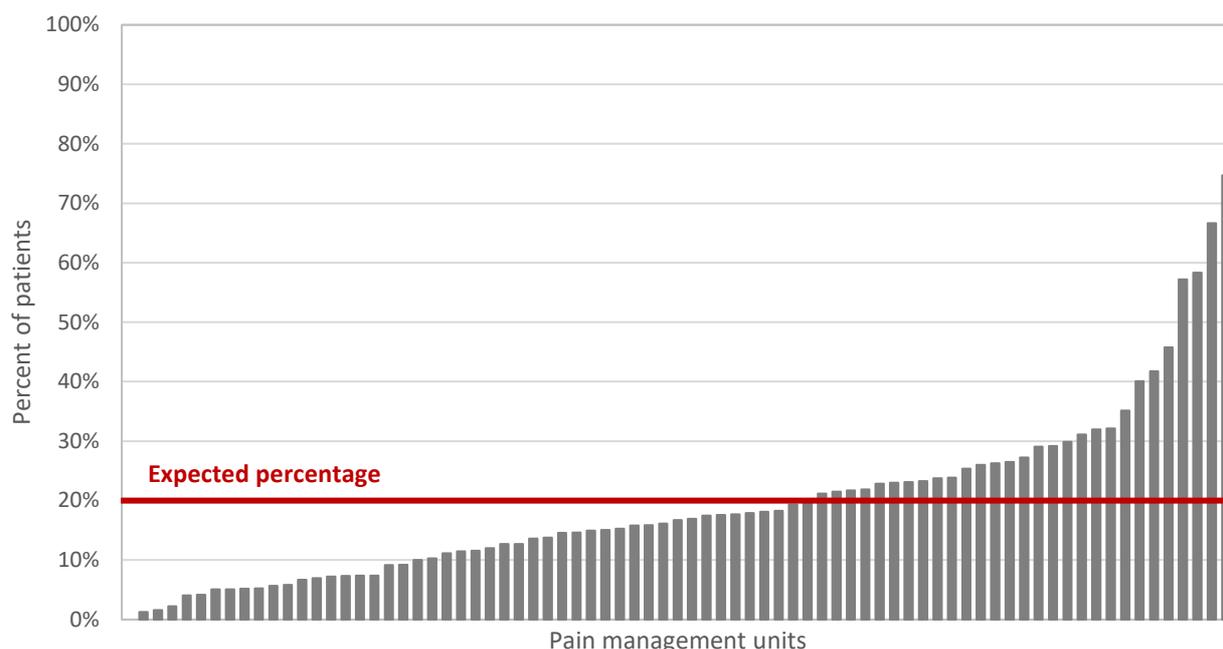
Scores on ePPOC and PaedePPOC assessment tools are shown by area of disadvantage in Table 1 and Table 2 below. Across all adult assessment tools, symptom severity increases with increasing socioeconomic disadvantage. This pattern of increasing severity with disadvantage was not evident for the paediatric population.

Table 1. Adult assessment tool scores by area of socioeconomic disadvantage, mean (SD)

Disadvantage quintile	Pain Severity	Pain Interference	Depression	Anxiety	Stress	Pain Catastrophising	Pain Self-Efficacy
	N=58638	N=60184	N=58699	N=58486	N=58462	N=57996	N=59183
1 (least disadvantage)	6.0 (1.8)	6.7 (2.1)	17.7 (12.7)	12.0 (10.3)	19.0 (11.5)	26.5 (13.9)	22.6 (13.6)
2	6.2 (1.8)	6.9 (2.0)	19.0 (12.8)	13.0 (10.6)	20.3 (11.4)	27.9 (14.0)	21.3 (13.0)
3	6.3 (1.8)	7.0 (2.0)	19.7 (12.7)	13.6 (10.8)	20.7 (11.3)	28.7 (13.9)	21.1 (13.1)
4	6.3(1.8)	7.0 (2.0)	20.1 (12.7)	13.9 (10.8)	21.1 (11.3)	29.0 (13.9)	20.7 (12.9)
5 (most disadvantage)	6.6 (1.8)	7.2 (2.0)	21.6 (12.8)	15.4 (11.2)	22.4 (11.4)	31.5 (14.1)	19.5 (13.1)

* measured at referral using the Brief Pain Inventory pain severity and interference questions, the Depression, Anxiety and Stress Scale, Pain Catastrophizing Scale and the Pain Self-Efficacy Questionnaire.

Table 2. Paediatric assessment tool scores by area of socioeconomic disadvantage, mean (SD)

Disadvantage quintile	Pain Severity	Functional disability	Quality of Life	Pain-related worries
	N=1273	N=1250	N=1273	N=778
1 (least disadvantage)	5.7 (2.0)	25.9 (11.7)	50.1 (17.4)	15.4 (5.5)
2	5.7 (1.9)	25.7 (12.0)	50.2 (16.7)	15.2 (5.8)
3	5.5 (2.1)	26.0 (12.7)	49.4 (18.1)	15.1 (6.8)
4	5.6 (2.0)	28.3 (11.4)	46.7 (17.5)	15.6 (6.0)
5 (most disadvantage)	5.6 (2.1)	27.3 (12.0)	46.7 (19.0)	15.9 (7.0)

* completed at referral by the child using the Brief Pain Inventory pain severity questions, Functional Disability Index, Pediatric Quality of Life Generic Core Scales, and the Bath Adolescent Pain Questionnaire – pain-specific anxiety subscale.

Summary

- In general, adult patients were equally likely to be referred to a pain management service regardless of whether they lived in an area of high compared to low disadvantage.
- Referrals for paediatric pain management were not equitable, with one in three referrals coming from areas identified as least disadvantaged, while one in eight referrals were from areas identified as the most disadvantaged
- In adult patients, scores on the assessment tools showed increasing severity with increasing area disadvantage. This pattern was not seen in children referred to specialist paediatric pain services.
- Further studies will investigate:
  - Factors that might influence the interaction of socioeconomic disadvantage and severity scores at referral, including proximity to a pain management service, duration of pain and waiting time
  - Whether patient outcomes are influenced by socioeconomic disadvantage

Appendix A: Process for geocoding of patient address

Referrals to Australian pain management services

To assess equity in provision of services to people living in areas of differing socioeconomic disadvantage, the Australian Bureau of Statistics (ABS) Socio-Economic Indexes for Areas Index of Relative Disadvantage (SEIFA-IRSD) was used. The index provides measures of socioeconomic status mappable to postcodes. This index assigns each postcode a score based on the integration of census variables such as income, educational attainment and unemployment. Lower scores represent more disadvantaged areas.

Referrals to New Zealand pain management services

To assess equity in provision of services to people living in areas of differing socioeconomic disadvantage, the NZ Index of Relative Socioeconomic Deprivation, (NZDep2013) was used. NZDep2013 combines nine variables from the 2013 census which reflect eight dimensions of deprivation (communication, income, employment, qualifications, owned home, support, living space and transport). The higher the NZDep2013 score, the more disadvantaged the area. The NZDep2013 data were obtained from Otago University.

NZDep2013 provides a deprivation score for each meshblock in New Zealand. Meshblocks are geographical units defined by Statistics New Zealand, containing a median of approximately 81 people in 2013 (the smallest statistical area in NZ). Meshblocks are not directly mappable to NZ postcodes. To estimate postcode level NZDep2013, geospatial data from Koordinates were obtained. The data provided both postcode and meshblock for each address in NZ. Some meshblocks crossed over postcodes. Where this occurred the most commonly occurring postcode within a meshblock (i.e. most addresses) was assigned to the meshblock. The postcode of each meshblock was mapped to NZDep2013 by meshblock. Each postcode comprised multiple meshblocks, each with their own NZDep2013 score. To determine an NZDep2013 score by postcode, the data was weighted by the population of the meshblock and then the median NZDep2013 score was assigned to the postcode.

Comparing Australian and New Zealand disadvantage scores

Lower SEIFA-IRDS scores and quantiles reflect **higher** disadvantage, whereas the opposite is true for NZDep2013, with lower scores and quantiles reflecting **lower** disadvantage. For the Australian and NZ data to be comparable, SEIFA quintiles were recoded such that low quintiles similarly reflected low disadvantage.

Series List

2018

No.1 2018: *Normative data for patients referred for specialist pain management in Australia*

No.2 2018: *Normative data for children and adolescents referred for specialist pain management in Australia*

No.3 2018: *Carer-proxy and child self-reported ratings of pain and quality of life*

2019

No. 1 2019: *Socioeconomic disadvantage and referral to pain management services in Australasia*