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Clarifying the geographic dispersion of essential health services for people with spinal cord injury in rural and remote Queensland: A spatial study

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Introduction

- The proximate availability of health services - often regarded as 'potential availability' - refers to the positioning of services in a time and space relative to end users [1].
- Considering the proximate availability of health services is important as health service nearness is associated with increased health service use [2-5].
- The potential for increased health service use due to proximity is especially important for people with disability as research has established that people with disability have poorer access to health services compared to people without disability [6], and that increased health service use is associated with favourable health and wellbeing outcomes [7].

Purpose

- The impact that remoteness has on the proximate availability of health services for people who have a spinal cord injury (SCI) in Australia is unclear.
- Consequently, a spatial analysis was conducted to clarify the impact that remoteness had on the proximate availability of health services for people with SCI. The study sought to address the stated research questions:

1. What is the difference in travel time to the nearest hospital for participants with SCI living in diverse remoteness classifications in Queensland?
2. What is the difference in the number of general practitioners (GPs) and pharmacies available within a one hour drive for participants with SCI living in diverse remoteness classifications in Queensland?

Methods

- Ethical approval to conduct this study was provided by the Griffith University Human Research Ethics Committee (ID: GUHREC - 2018/004).
- A subset of participants who completed a survey to ascertain their perceived accessibility of health services and places in the community were included within a spatial analysis.
- Nineteen participants who resided in Rural and Remote Queensland were matched with 19 participants residing in Major Cities in Queensland, and 19 participants residing in Inner Regional Queensland.
- Geocoded locations of hospitals, GPs and pharmacies, were obtained from Health Direct's, National Health Service Directory
- Data analysis was conducted using a combination of ArcMap 10.4.1, and SPSS.
- A service area analysis was conducted to ascertain the number of GPs, and pharmacies located within a 60 minute drive from each participant. For hospitals, network analyses were conducted to establish the travel time from each participant to the closest hospital.
- In SPSS, non-parametric inferential analyses using the Kruskal-Wallis test statistic were progressed to establish if significant differences in proximity to essential health services existed between participants within the three geographical classifications.
- Descriptive statistics clarifying the mean number of GPs and pharmacies within a one hour drive time of participants, and the mean travel time to the closest hospital for participants has been included the table below.

Classification	Number of GPs	Number of Pharmacies	Drive Time (min) to Hospital
Major Cities	652	427	7.58
Inner Regional	177	112	14.11
Rural and Remote	42	37	8.51

Findings

- Compared to participants within Rural and Remote and Inner Regional Queensland, there were significantly more GPs and pharmacists within a one hour drive for participants residing in Major Cities of Queensland. While, the number of general practitioners and pharmacies was not significantly different between participants within Rural and Remote and Inner Regional Queensland.
- In relation to drive time to the nearest hospital, travel times (in minutes) for participants across the three geographical classifications were not significantly different. Pairwise comparison coefficients for the number of GPs and pharmacies within a one hour drive, and travel time to nearest hospital are included below.

Pairwise Comparisons	Kruskal-Wallis H	Asymp Sig.
Number of GPs: Rural & Remote – Inner Regional	1.370	.242
Number of GPs: Rural & Remote – Major Cities	27.881	.000
Number of GPs: Inner Regional – Major Cities	21.75	.000
Number of Pharmacies: Rural & Remote – Inner Regional	1.210	.273
Number of Pharmacies: Rural & Remote – Major Cities	27.803	.000
Number of Pharmacies: Inner Regional – Major Cities	21.70	.000
Drive time to Hospital: Rural & Remote – Inner Regional	1.923	.166
Drive time to Hospital: Rural & Remote – Major Cities	.72	.398
Drive time to Hospital: Inner Regional – Major Cities	2.625	.105

Points for Consideration

- To the knowledge of the authors, this is the first study that has used spatial methods to investigate the geographic dispersion of health services in relation to people with SCI in Australia.
- This study confirms previous Australian research which clarified that rural regions have a poor proximate availability of health services, in particular GPs [8, 9]. Given that people with SCI typically identify their general practitioner by trailing multiple, until the one that best suits their needs is confirmed [10] the findings suggest that people with SCI in Major Cities within Queensland may have a better opportunity to select a GP that suits their needs.
- The lack of health service options for people with SCI in Rural and Remote Queensland, may mean that people within these regions live with health conditions that go untreated, and potentially result in avoidable hospital visits.
- The findings from this study also suggest that travel time to receive emergency care is less sensitive to rurality. This is likely due to the fact that people within the study sample preferred to live proximate to a hospital and health service irrespective of rurality.

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