

Gender differences in multidimensional accessibility to healthcare in contexts of deprivation

Cabrera-Barona Pablo
University of Salzburg
Interfaculty Department of Geoinformatics – Z_GIS
Salzburg, Austria
pablo.cabrera-barona@stud.sbg.ac.at

Abstract

Gender differences in access to a human right such as healthcare are a concern that requires evaluation considering different dimensions and contexts. The accessibility to healthcare is a multidimensional process that is not limited to the spatial separation between populations and healthcare services. Additionally, a gender-based perspective of accessibility to healthcare can be related to neighbourhood-based social measures such as deprivation, and to individual-based socio-demographic variables. In this research, an individual-based index of multidimensional accessibility to healthcare and an area-level index of deprivation are calculated. The values of the index of multidimensional accessibility to healthcare were classified by gender and by quintiles of deprivation. Additionally, the values of the index of multidimensional accessibility to healthcare for women were classified in terms of the socio-demographic variables of age, college education, employment and tenure of health insurance. No marked differences of accessibility to healthcare between men and women, and between the different quintiles of deprivation, were found. However, more accessibility to healthcare was determined among women with college education and health insurance.

Keywords: Gender, accessibility to healthcare, deprivation

1 Introduction

Measures of accessibility to urban opportunities can have a gender bias [1], and gender differences in accessing healthcare services have been identified [2]. Deprivation refers to material and social disadvantages [3] that can be expressed at an individual or areal level. The accessibility to healthcare is a multidimensional concept that is expressed by using objective and subjective measures [2], [4]. Accessibility can be measured in terms of spatial separation between healthcare services and populations [5]. This kind of accessibility can also be measured through the availability of healthcare services and acceptability of these services from the point of view of the patients [6]. Additionally, it is possible to incorporate peoples' perceptions into spatial accessibility measures [2]. The association between deprivation and healthcare accessibility can vary depending on the study area. For instance, more deprived areas are not necessarily located farther from healthcare services [7]. Thus, to evaluate

individual gender inequalities in access to healthcare, considering different levels of neighbourhood-based (contextual) deprivation offers important insights that can support the understanding and planning of citizens' health and well-being. Using the city of Quito (Ecuador) as the study area, this research applies two indices to evaluate gender-based differences related to accessibility to healthcare and deprivation: the composite health-care accessibility (CHCA) index [8] and an index of urban deprivation (IUD) for the city of Quito [9]. These indices have been previously successfully associated with different health-related variables and primary healthcare services.

2 Methods

The CHCA for the city of Quito was used to represent accessibility to healthcare services. This index is composed of three indicators: acceptability (level of patients' confidence in

Table 1: Indicators that compose the deprivation index and their corresponding weights

Indicators	Weights
% of the population that have been physically disabled for more than a year	0.048
% of the population that does not have any level of formal education	0.067
% of the population that has no public social insurance	0.090
% of the population that works without payment	0.111
% of households with 4 or more persons per dormitory	0.039
% of households without access to the public drinking water system	0.228
% of households without access to the sewerage system	0.102
% of households without access to the public electricity grid	0.108
% of households with no garbage collection service	0.076
Distance to the nearest primary healthcare service	0.131

the healthcare service), availability (waiting time -in hours- to receive the healthcare) and spatial accessibility. This latter indicator is composed of perceived travel times (commuting times -in hours- from households to healthcare services), a coefficient of travel-friction, and the number of accessible healthcare services in a given place. These indicators were extracted by conducting a survey in the study area. This survey used pseudo-random door-to door interviews in households where people were willing to participate. The present study utilizes 472 interviewees’ responses. A detailed explanation of the survey and how the CHCA is calculated can be read in Cabrera-Barona et al. 2016 [8]. In this study, the CHCA values were normalized, with values closer to one indicating higher accessibility to healthcare. The IUD is composed of several indicators (Table 1) that represent social and material disadvantages and that are suitable to explain health issues [10]. The indicators that compose the IUD are weighted by applying the analytical hierarchical process (AHP). The methodology of the AHP -including its application to a deprivation index- is outlined in several studies [11]–[14]. A detailed explanation of how the IUD is calculated can be read in Cabrera-Barona et al. 2017 [9]. Table 1 depicts the indicators and their corresponding AHP-based weights. The IUD was calculated for each census block within the study area (4037 census blocks) by applying linear aggregations of the weighted normalized indicators. These census blocks are considered the neighborhoods or contexts where the individuals experiencing multidimensional accessibility to healthcare -represented by the CHCA index- are located. The IUD values were normalized, where values closer to one mean higher deprivation. These values were also divided into quintiles. Then, the averages of the CHCA index were divided into male and female individuals, and classified depending on the quintile of deprivation they correspond to. Finally, the average values of the CHCA index for women were divided into the categories of age, college education, employment and tenure of health insurance.

3 Results

Table 2 shows the average values of the CHCA index classified by gender and contexts of deprivation. Most male and female individuals are located in deprivation areas belonging to quintile 2. There are similar averages of multidimensional accessibility to healthcare for women and men (and low standard deviations) between the different quintiles of deprivation. Only the subjects located in areas of quintile 2 of deprivation have slightly more accessibility than the subjects located in other areas with different deprivation quintiles. In general, women and men in different contexts of deprivation have fairly even access to healthcare services in the given study area. Table 3 shows the averages of women’s accessibility to healthcare divided into the categories of age, college education, employment and tenure of health insurance. No marked differences of CHCA index averages were found in these classifications. However, in the case of college education and insurance, the differences are more indicative, showing that women with college education and health insurance experienced higher accessibility to healthcare.

4 Discussion

The CHCA index is a multidimensional measure that represents the complexity of assessing access to healthcare. This kind of accessibility measure is complex in that it takes into consideration that individuals may have several healthcare options to choose from, and that there are neighbours that potentially may select these options. The CHCA index also incorporates the perceived travel time that the individuals experienced to arrive at the healthcare service. The perceptions of accessibility are important considerations to better understand patients’ perspectives and feelings regarding the access to healthcare [2], [4]. Notwithstanding these enhancements to measure accessibility, an inherent “gender bias” can exist in accessibility, and this bias is not analysed in the majority of cases. In this study, contrary to the expectations of finding a gender bias in accessibility to

Table 2: Gender differences in accessibility to healthcare related to different contexts of deprivation

<i>Deprivation</i>	Women			Men		
	<i>N</i>	<i>CHCA mean</i>	<i>sd</i>	<i>N</i>	<i>CHCA mean</i>	<i>sd</i>
Least deprived - 1	55	0.36	0.17	38	0.36	0.14
2	81	0.50	0.24	69	0.43	0.20
3	55	0.34	0.14	49	0.34	0.15
4	42	0.32	0.13	32	0.34	0.12
Most deprived - 5	24	0.33	0.12	27	0.33	0.12

Table 3: Differences of women’s access to healthcare classified by age, college education, employment and insurance tenure

Age	<i>N</i>	<i>CHCA mean</i>	<i>sd</i>
<18	18	0.42	0.23
18-39	130	0.39	0.20
40-60	81	0.37	0.18
>60	28	0.40	0.19
College education			
No	179	0.36	0.19
Yes	78	0.44	0.19
Employment			
No	92	0.40	0.21
Yes	165	0.38	0.18
Health insurance			
No	145	0.36	0.18
Yes	112	0.43	0.20

healthcare, differences in accessibility to healthcare of men and women between deprivation quintiles were not meaningful. Notwithstanding, areas with higher deprivation tend to have more health-related difficulties [15], [16]. From the point of view of healthcare, the Inverse Care Law suggests that more vulnerable -or deprived- people may have less access to adequate healthcare. However, despite this assumption, there is evidence that people living in more deprived areas can be located closer to healthcare services [7]. The findings of the present study are consistent with this evidence. Pearce et al. 2007 [17] also found that more deprived neighbourhoods have better access to community resources such as health facilities. Pearson et al. 2013 [18] reported that deprived neighbourhoods can also be neighbourhoods with high resilience, and this resilience is related to the dense population in urban areas. The study area of Quito also exhibits these characteristics. For instance, less affluent neighbourhoods located in the south of the city are places that have appropriate access to community resources such as groceries, educational services and health services. Additionally, these neighbourhoods are densely populated. In Quito, women and men living in areas with the highest deprivation (quintile 5) experience similar multidimensional accessibility to healthcare (CHCA index) to women and men living in the less deprived areas (quintile 1). The areas with the quintile 2 of deprivation are those with the majority of interviewed people and with the maximum averages of the CHCA index. It is interesting to remark that, in this quintile, the average of the CHCA index for women is slightly higher than the average for men. However, the landscape of gender inequality in healthcare accessibility related to deprivation is not marked in the study area. Inequality in healthcare accessibility is presented within the women study group, considering differences of college education and health insurance. This situation demonstrates how individuals with better living conditions, such as having health insurance, can have better access to healthcare. These findings are also consistent with the study of Cabrera-Barona et al. 2016 [8], which reported the importance of education and health insurance as predictors of the CHCA index. They found that the variable of having health insurance was the most significant factor related to a better multidimensional accessibility to healthcare. These individual differences in the women study group show how individual resilience ensures better health opportunities. Resilient individuals may experience good access to healthcare independently of the level of deprivation of the neighbourhoods they live in. On the other hand, vulnerable individuals (i.e. individuals with socioeconomic disadvantages) can be affected by deprived neighbourhoods [19].

Future research related to this study can use different indicators to define the IUD. For instance, the accessibility domain of the IUD can be modified to include different kinds of healthcare services. Additionally, it might be useful to contrast the obtained results with results obtained by using simple measures of accessibility, such as Euclidean distances or travel distances. Finally, future research can apply statistical tests to find whether there are significant differences of multidimensional accessibility between groups of women and men independently of the context of deprivation.

5 Conclusion

No marked gender differences of multidimensional accessibility to healthcare were found in the context of deprivation. More accessibility to healthcare was determined among women with college education and health insurance. These results suggest that having education and health insurance support a better accessibility to healthcare. Inequality related to health can have gender and contextual (deprivation) implications; however, individual resilience is a very important condition influencing health issues such as accessibility to healthcare.

References

- [1] M.-P. Kwan, "Gender and Individual Access to Urban Opportunities: A Study Using Space-Time Measures," *Prof. Geogr.*, vol. 51, no. 2, pp. 210–227, 1999.
- [2] T. L. Hawthorne and M.-P. Kwan, "Using GIS and perceived distance to understand the unequal geographies of healthcare in lower-income urban neighbourhoods," *Geogr. J.*, vol. 178, no. 1, pp. 18–30, 2012.
- [3] P. Townsend, "Deprivation," *J. Soc. Policy*, vol. 16, no. 2, pp. 125–146, 1987.
- [4] A. J. Comber, C. Brunsdon, and R. Radburn, "A spatial analysis of variations in health access: linking geography, socio-economic status and access perceptions," *Int. J. Health Geogr.*, vol. 10, no. 44, pp. 1–11, 2011.
- [5] P. L. Delamater, "Spatial accessibility in suboptimally configured health care systems: A modified two-step floating catchment area (M2SFCA) metric," *Heal. Place*, vol. 24, pp. 30–43, 2013.
- [6] R. Penchansky and J. W. Thomas, "The Concept of Access: Definition and Relationship to Consumer Satisfaction," *Med. Care*, vol. 19, no. 2, pp. 127–140, 1981.
- [7] J. Adams and M. White, "Socio-economic deprivation is associated with increased proximity to general practices in England: An ecological analysis," *J. Public Health (Bangkok)*, vol. 27, no. 1, pp. 80–81, 2005.
- [8] P. Cabrera-Barona, T. Blaschke, and S. Kienberger, "Explaining Accessibility and Satisfaction Related to Healthcare: A Mixed-Methods Approach," *Soc. Indic. Res.*, 2016.
- [9] P. Cabrera-Barona, T. Blaschke, and G. Gaona, "Deprivation, Healthcare Accessibility and Satisfaction: Geographical Context and Scale Implications," *Appl. Spat. Anal. Policy*, pp. 1–20, 2017.
- [10] P. Cabrera-Barona, C. Wei, and M. Hagenlocher, "Multiscale evaluation of an urban deprivation index: Implications for quality of life and healthcare accessibility planning," *Appl. Geogr.*, vol. 70, pp. 1–10, May 2016.
- [11] S. Boroushaki and J. Malczewski, "Implementing an

- extension of the analytical hierarchy process using ordered weighted averaging operators with fuzzy quantifiers in ArcGIS,” *Comput. Geosci.*, vol. 34, pp. 399–410, 2008.
- [12] P. Cabrera-Barona, T. Murphy, S. Kienberger, and T. Blaschke, “A multi-criteria spatial deprivation index to support health inequality analyses,” *Int. J. Health Geogr.*, vol. 14, no. 11, 2015.
- [13] T. L. Saaty, “A Scaling Method for Priorities in Hierarchical Structures,” *J. Math. Psychol.*, vol. 15, pp. 234–281, 1977.
- [14] R. Saaty, “The analytic hierarchy process-what it is and how it is used,” *Math. Model.*, vol. 9, no. 3–5, pp. 161–176, 1987.
- [15] S. Havard, S. Deguen, J. Bodin, K. Louis, O. Laurent, and D. Bard, “A small-area index of socioeconomic deprivation to capture health inequalities in France,” *Soc. Sci. Med.*, vol. 67, pp. 2007–2016, 2008.
- [16] R. Pampalon, D. Hamel, P. Gamache, and G. Raymond, “A deprivation index for health planning in Canada,” *Chronic Dis. Can.*, vol. 29, no. 4, pp. 178–191, 2009.
- [17] J. Pearce, K. Witten, R. Hiscock, and T. Blakely, “Are socially disadvantaged neighbourhoods deprived of health-related community resources?,” *Int. J. Epidemiol.*, vol. 36, pp. 348–355, 2007.
- [18] A. L. Pearson, J. Pearce, and S. Kingham, “Deprived yet healthy: Neighbourhood-level resilience in New Zealand,” *Soc. Sci. Med.*, vol. 91, pp. 238–245, 2013.
- [19] M. Stafford and M. Marmot, “Neighbourhood deprivation and health: does it affect us all equally?,” *Int. J. Epidemiol.*, vol. 32, pp. 357–366, 2003.