

Extended abstract

*Accessibility Problems among
the Elderly Population to Health
Services. The Case of Castilla y León
(Spain)*



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Highlights:

1. Rural areas have the greatest problems of accessibility to health resources.
2. The oldest Basic Health Areas in Castilla y León are the furthest away from hospitals.
3. 20 % of the population of Castilla y León resides in a Basic Health Zona that is inaccessible to their referral hospital.
4. 26 % of the population over 65 year resides in a Basic Health Zona that is inaccessible to their referral hospital.

Abstract: The accessibility of the population to health resources is fundamental for social equity among the inhabitants of a territory. This accessibility is worst on the rural areas that, furthermore, are often older spaces and more demanding of health resources. In the case of Castilla y León, there are areas whose access to health resources is very limited due to the time that the population has to spend travelling to these resources. This study identifies the Basic Health Areas with accessibility problems and quantifies the time spent by the population of Castilla y León travelling to their reference hospitals, as well as their level of ageing. The results of this territorial analysis confirm that Basic Health Areas furthest from the hospitals correspond to rural areas with a high level of ageing, thus aggravating the problem of emptying of health services that rural areas have been experiencing since the 2008 crisis. This research can help to propose a reorganisation of health resources in Castilla y León and in other territories where this methodology could be applied, helping the rural population to have better access to them.

Keywords: Sanitary System, Health Areas, Old Ageing, Population.

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1. Introduction and justification

With the development of post-Fordist capitalism, territorial inequalities have increased, causing social imbalances in the access to healthcare resources. These social inequalities in healthcare are defined as avoidable and unfair differences that aggravate the situation of vulnerable populations.

The main territorial inequalities in healthcare are found between urban and rural areas, as the former have better healthcare equipment than the latter.

One of the tools to analyse territorial inequalities is to measure accessibility to different types of healthcare services. This indicator is used in diverse disciplines, adapting measurements of different parameters, to assess disparities in the access to different places. Accessibility to healthcare services is not only measured in terms of distance, but also in terms of time and the type of population travelling to them, and the means of transport used.

Castilla y León is, spatially, a very large region, with a sparse and ageing population, which has lost health and public transport services due to the depopulation of rural areas since the 1950s. The Junta de Castilla y León implemented Basic Health Zones in 1986, however regional population has aged and services in rural areas have been reduced since then, causing growing accessibility problems to healthcare services, particularly for the elderly.

2. Aims, methodology and sources

The main aim is to identify and quantify the inequalities in the accessibility to the healthcare system in Castilla y León, particularly among the elderly population residing in rural areas. To this end, the healthcare map of the region and its zoning into Basic Health Zones (BHZ), the smallest divisions established by healthcare planning laws, is presented first. This healthcare map is the source from which accessibility, as described by Rodrigue, Comtoin and Slack (2016), is analysed then -measuring accessibility from to hospitals, mainly located in the provincial capitals.

The second objective is to analyse the correlation between BHZ accessibility and population ageing, drawing its spatial patterns through a cluster analysis with the

intention validate the initial hypothesis that: the most inaccessible areas of the region are the most aged, confirming that healthcare inequality present in Castilla y León.

With the Service Areas tool offered by the ArcGIS software, the distance, in minutes, from the healthcare centres to the reference hospital was calculated. Time intervals of 10, 30, 60 and more than 60 minutes were used, and speed limits in each type of road, also considered. According to Article 1.3 of the Royal Decree 137/1984 of 11 January, a BHZ which is more than 30 minutes away from the hospital is considered as inaccessible.

Once the healthcare accessibility map has been obtained, ageing variables and the accessibility of each BHZ have been correlated. Then, the BHZ have been grouped -according to the distance in minutes to the reference hospital and the percentage of the population aged 65 and over residing in each BHZ -using the hierarchical clustering technique.

Therefore, four clusters, as internally homogeneous and as different from each other as possible, have been configured.

The two main data sources are the Regional Department of Health and the "*Portal de Sanidad de Castilla y León*". From these, we have obtained population (based on health cards) and ageing rates per BHZ, as well as the geographical distribution of healthcare centres and hospitals.

3. Results

In Castilla y León there are 108 BHZ more than 30 minutes away from their reference hospital, representing 20% of the regional population. These BHZs are mainly in rural mountainous areas, at the border of the Autonomous Community, or in provincial limits, where there are no urban areas nearby. In them, access to healthcare services is more complicated due to the orography of the terrain, the poor state and typology of roads and the concentration of healthcare services in urban areas.

In 8 of the 9 provinces, at least 35% of the population live in a BHZ more than 30 minutes away from the reference hospital, the exception being Ávila, where nearly 50% reside in an area more than 30 minutes away from.

As for the population over 65 years old, 25% of all the region's elderly people reside in a BHZ more than 30 minutes away from their reference hospital, with five of the more aged BHZ being more than an hour's drive from the hospital.

The correlation between travelling time and the proportion of population over 65 years old per BHZ confirms the hypothesis that the greater the distance of a Basic Health Zone to its reference hospital, the more elderly population it has. However, the R^2 is not high because the BHZs are not perfectly situated around the regression line but form several clouds, showing basic health zones with similar characteristics. Therefore, a hierarchical cluster analysis has been carried out to distinguish these clusters of BHZs, resulting in four groups or categories.

The analysis shows that the 247 BHZs in Castilla y León are, on average, 28.7 minutes away from their reference hospital and that almost 30% of the population is aged 65 and over. However, these figures are much higher in two out of the four categories, and much lower in one category grouping urban and periurban BHZ.

4. Discussion

The interrelation between accessibility and ageing shows that it is necessary for administrations to adopt socio-health measures -to provide homecare and elderly people's homes in rural areas that have a high proportion of people over 65 years old. These measures to increase the physical and mental wellbeing of the elderly should be combined with others providing transport to hospitals in case of need.

Castilla y León is a prototypical example of a highly ageing region, particularly in rural areas, that are far from the main cities and have inefficient public transport systems. This combination of ageing and poor accessibility to healthcare services has been developing for decades, due to two depopulation waves. The first between the 1950s and 1970s (González Leonardo & López Gay, 2019), and the second is occurring presently due to the high mortality rates of a very elderly population that did not emigrate in the first wave of depopulation and the departure of young, qualified Castilian and Leonese people (González-Leonardo & López-Gay, 2021). The latter are leaving the region because economic activities and services concentrate in Spain's main urban areas (Molina Ibáñez, 2019). This last trend, together with the technification of agricultural activities and the fact that rural population is disperse, has meant that despite the improvement of services in rural areas the gap with respect urban ones has increased (Collantes & Pinilla, 2020).

5. Conclusions

In Castilla y León there is a major problem of unequal access to hospital infrastructures, as there is no healthcare network reaching every corner of the region with the same quality. This problem is exacerbated by the fact that there is an elderly population living in rural disperse large territory, which are often poorly communicated. Indeed, a significant part of this elderly population lives far from a hospital. More precisely, 26% of the region's people over 65 years old live in a BHZ located more than 30 minutes away from their reference hospital. Therefore, they have become a vulnerable population that does not have the same access to a hospital as a person living in a city, in the suburbs, or in a rural municipality close to it.

6. Future orientations

The study could be useful for future research on the spatial distribution of hospitals. As it has been observed in this contribution, and seen in provinces where there is only one, regional hospitals are particularly relevant. Therefore, we propose, to continue analysing accessibility to hospitals and other reference healthcare centres by age group, in order to detect possible future user demands and solutions to plan healthcare centres.