GEOGRAPHIC ACCESSIBILITY AND MEDICAL SERVICES UTILIZATION RELATED TO CARDIOVASCULAR DISEASES IN BIST DOAB (PUNJAB)

Anandvir KaurSaini*

Abstract

Geographic accessibility to health care services is determined by proximity to health care services and state of transportation networks.The aim of this paper is to examine the geographical accessibility of medical facilities related to cardiovascular diseases in Bist Doab region of Punjab.The data for the present paper has been obtained from Department of Health and Family Welfare (Punjab), Punjab Health Systems Corporation as well as field survey. The results show that the study region has a good availability of ambulance service for transferring the emergency cases of cardiovascular diseases, however the density of major roads is very low along the eastern border of the region (due to undulating hilly area) and the extreme western margins of the study area. These areas of low density of major roads have lower level of geographic accessibility to health care institutions. New hospitals with specialized facilities should be established to reduce distance travelled by cardiovascular patients for seeking medical treatment. The density of motorable roads should also be increased in unfavourable areas to improve accessibility to health care services.

Keywords: Cardiovascular diseases, geographic accessibility, health care services.

* Former UGC Research Fellow, Department of Geography, Panjab University, Chandigarh

Introduction

Cardiovascular diseases are estimated to become the leading cause of death in India by the year 2020. But they have already become the most prominent cause of death in Punjab, accounting for nearly half of the total deaths in the state. Cardiovascular diseases are ambulatory-care sensitive diseases. Considering the critical and emergency circumstances associated with these diseases, the role of health care services becomes all the more important in the timely treatment of the patients. It is crucial that the medical facilities are geographically accessible to the entire population living in an area. Geographic accessibility to health care services is determined by proximity to health care services and state oftransportation networks.

Scholars like Robson (2000), Brabyn and Skelly (2002), Guagliardo (2004), Jordan et al. (2004) and Morrissey et al. (2008) have examined the spatial variation and accessibility of health care provisions as well as the dynamics of hospital catchment areas in different geographical settings of the world. As far as heath care services dealing particularly with the treatment of cardiovascular diseases are concerned, Hare and Barcus (2007) conducted a study on the geographical accessibility and service utilization related to cardiovascular diseases in Kentucky, U.S.A. The authors used a spatial comparison of the geographical distribution of service usage and travel time to hospitals for assessing the relationship between accessibility and health and found that people living in rural areas travel further to utilize the health care services and populations residing more than 45 minutes from health care facilities had greater chances of being socially and economically marginalized.

The aim of this paper is to examine the geographical accessibility of medical facilities related to cardiovascular diseases in Bist Doab region of Punjab. Bist Doab is one of the three cultural regions of Punjab (along with Majha and Malwa). The region is home to nearly 20% of Punjab's total population and consists of four districts namely, Jalandhar, Kapurthala, Hoshiarpur and Nawanshahar.Approximately 72% of the population of the region lives in rural areas and this study is particularly focused on the rural population of the region.

Data and Methods

The data for the present paper has been collected from both primary as well as secondary sources. The data on the location of government medical institutions (sub-centres, subsidiary health centres, rural hospitals, primary health centres, community health centres, sub-divisional

hospitals, district hospitals), private practitioners (degree holders and registered medical practitioners) in Bist Doab has been obtained from the Department of Health and Family Welfare (Punjab) for the year 2010. In order to find the overall density of all the health institutions in the study region, point density analysis was done in ArcGIS. The point density tool in ArcGIS calculates the density of point features around each output grid cell. The density is given as points per square unit of map area. Weights have been assigned to the categories of health institutions according to their hierarchical order. Thus the resulting raster map displays weighted density of health institutions in the region.

The data on ambulances available in Bist Doab was taken from the website of Punjab Health Systems Corporation for the year 2011. The road map of Bist Doab was obtained from Punjab Administrative Atlas (2011). Line density analysis was performed in ArcGIS to find the density of major roads in the study area. While calculating the density, weights were assigned to the roads according to their importance and the final output map displayed weighted density of major roads in the study area.The distance travelled from village to hospitals and travel time for seeking medication was calculated on the basis of the primary data collected from fieldwork. The sampling design used in this study has been discussed elsewhere (Saini, 2014). A total of 100 deceased persons were selected from the study area, who had died from cardiovascular disorders in 2009 and the required information was obtained from the family members of the sampled deceased persons.

Density of Government Medical Facilities

The results of point density analysis of government health institutions in Bist Doab show three prominent areas of high density (Fig 1). The first major area of high density lies in the south-western parts of the study region, covering most of the expanse of block Banga, eastern parts of Nawanshahar, western parts of Saroya, Garhshankar and Mahilpur and northern parts of Aur. The second major area possessing high density of health institutions is spread over the entire block of RurkaKalan, eastern half of Jalandhar East block and western parts of Phillaur and Phagwara, and northern parts of Nurmahal and Nakodar blocks. The third belt of high density covers northern half of Hoshiarpur-I block, eastern parts of Tanda and Bhogpur, south-central parts of Dasuya and central parts of Talwara block. To the contrary, there are also vast stretches of areas having low density of health care institutions. The results show that the density

of government health institutions is lowest in Mukerian and Hajipur blocks, which have uneven hilly terrain. Other areas of low density lie in eastern parts of block Bhunga, Hoshiarpur-II and Mahilpur (all situated along the Shiwalik hills), and western as well as eastern margins of SultanpurLodhi block. All other parts of the study area have moderate density of government health institutions.

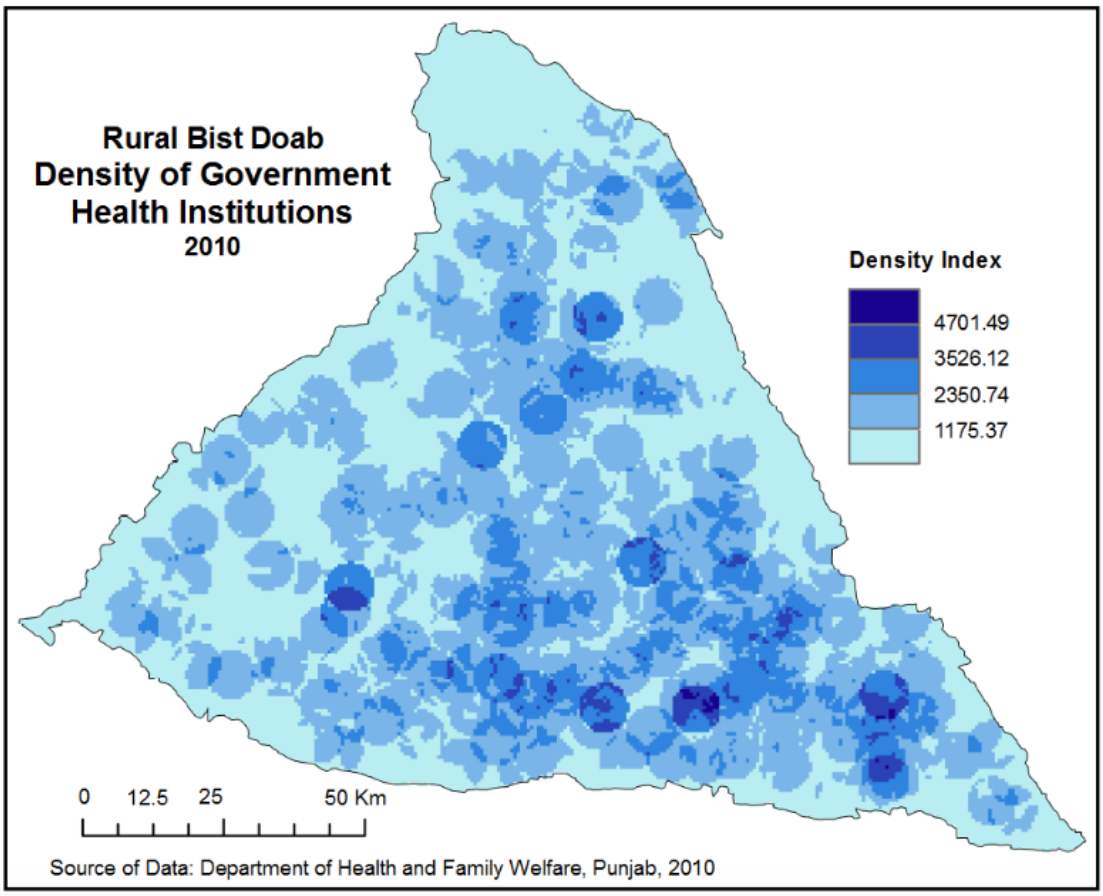

Fig 1

Geographic Accessibility and Service Utilization of Medical Facilities

The road network of the study area facilitates the geographic accessibility of health care institutions and emergency services provided by ambulances. The road density map of the study area shows that the density of major roads is highest in the central Bist Doab, comprising the district of Jalandhar (Fig 2). The western parts of neighbouring Nawanshahar district (blocks Nawanshahar and Banga) and Hoshiarpur-I block of district Hoshiarpur also have high density of road network. Therefore, the central Bist Doab has better accessibility to health care institutions than the peripheral eastern and western parts, where uneven relief and other physical problems

constrain the construction of roads. The density of roads is lowest in the areas lying along the entire eastern border due to the uneven hilly terrain. The blocks which fall in these areas are Hajipur, Talwara, Bhunga, Mahilpur, Garhshankar and Balachaur. The areas in extreme western margins of the study region (Sultanpur Lodhi block) also have very low density of road network. Thus all these areas of low density of major roads have lower level of geographic accessibility to health care institutions.

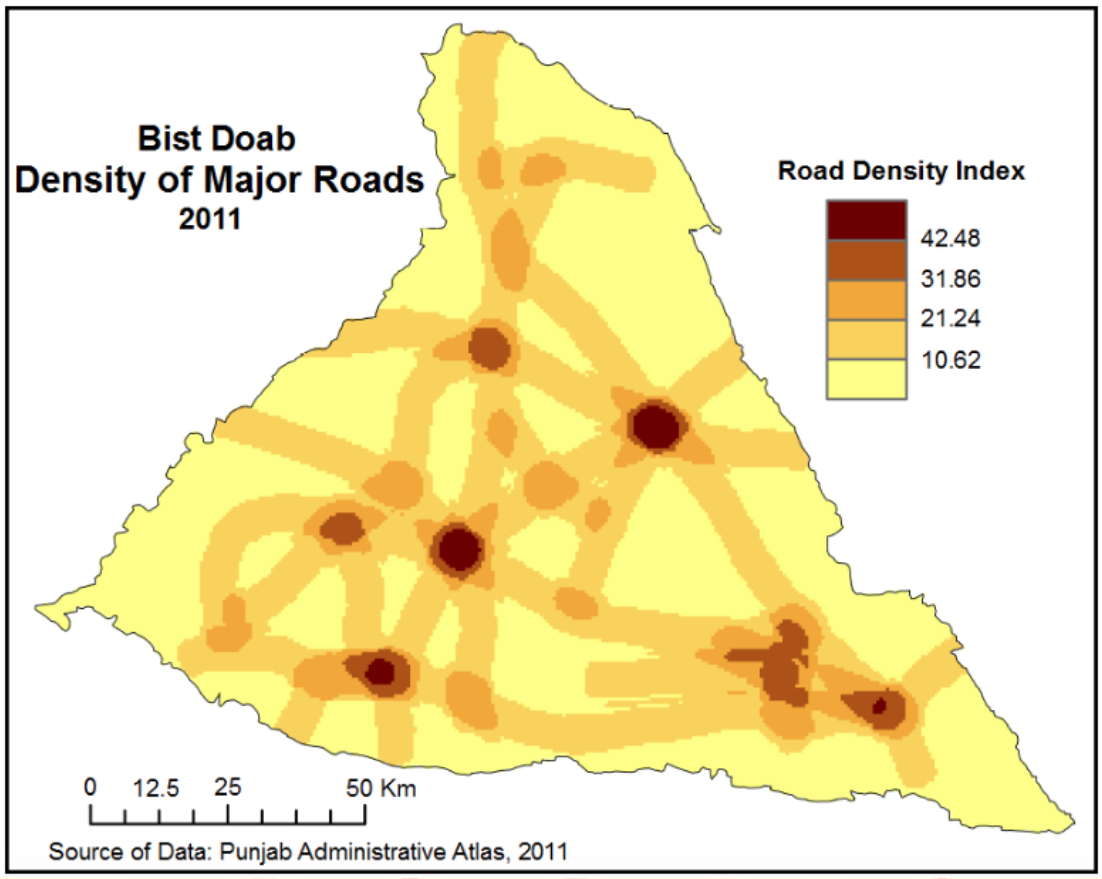

Fig 2

The analysis of primary data collected through intensive fieldwork shows that the average distance travelled by the sampled persons for seeking medication for cardiovascular diseases in the region was 22 km. Out of the total 100 sampled persons who died from cardiovascular disorders, 25 deceased persons (25%) had not travelled to any hosptital to seek medical help due to their sudden death (Fig 3). However, 11% of the sampled persons travelled a distance of 0 to 5 km, 7% travelled 5 to 10 km, 20% covered 10 to 15 km and 11% travelled 15 to 20 km to seek medication. As many as 12% of the sampled persons travelled a distance ranging from 20 to 40

km and 14% covered a distance of more than 40 km to seek medication for cardiovascular ailments.

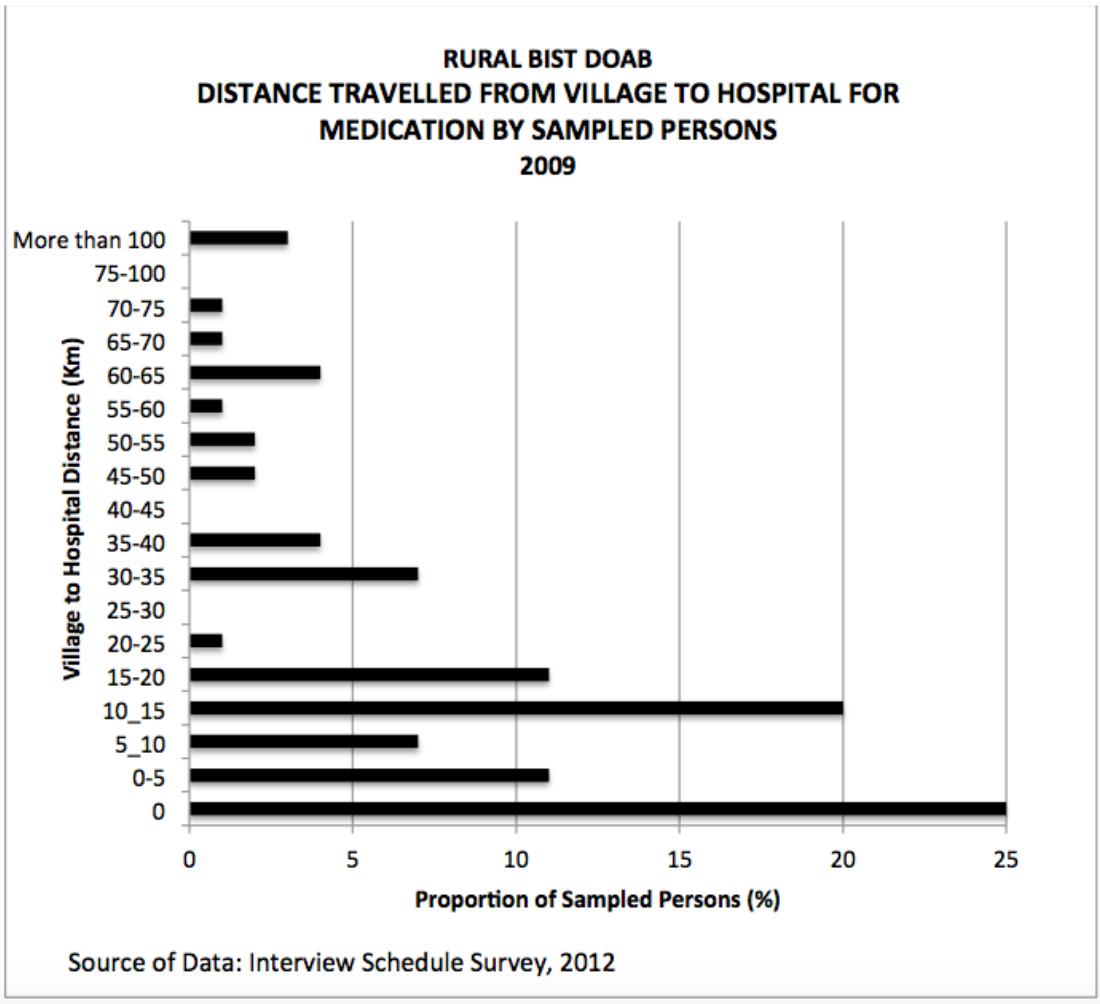

Fig 3 - Rural Bist Doab: Distance Travelled from Village to Hospital for Medication by Sampled Persons

It is thus clear that only 1/5th of the deceased population availed the heart-related speciality services located within 10 km of their place of residence. Another 1/3rd had to travel between 10 to 20 km and more than 1/4th of the sample covered a distance of above 40 km to seek specialized medical help for the treatment of cardiovascular diseases. It shows that the facilities to treat cardiovascular ailments are not available locally to most of the sampled popluation in the study area.

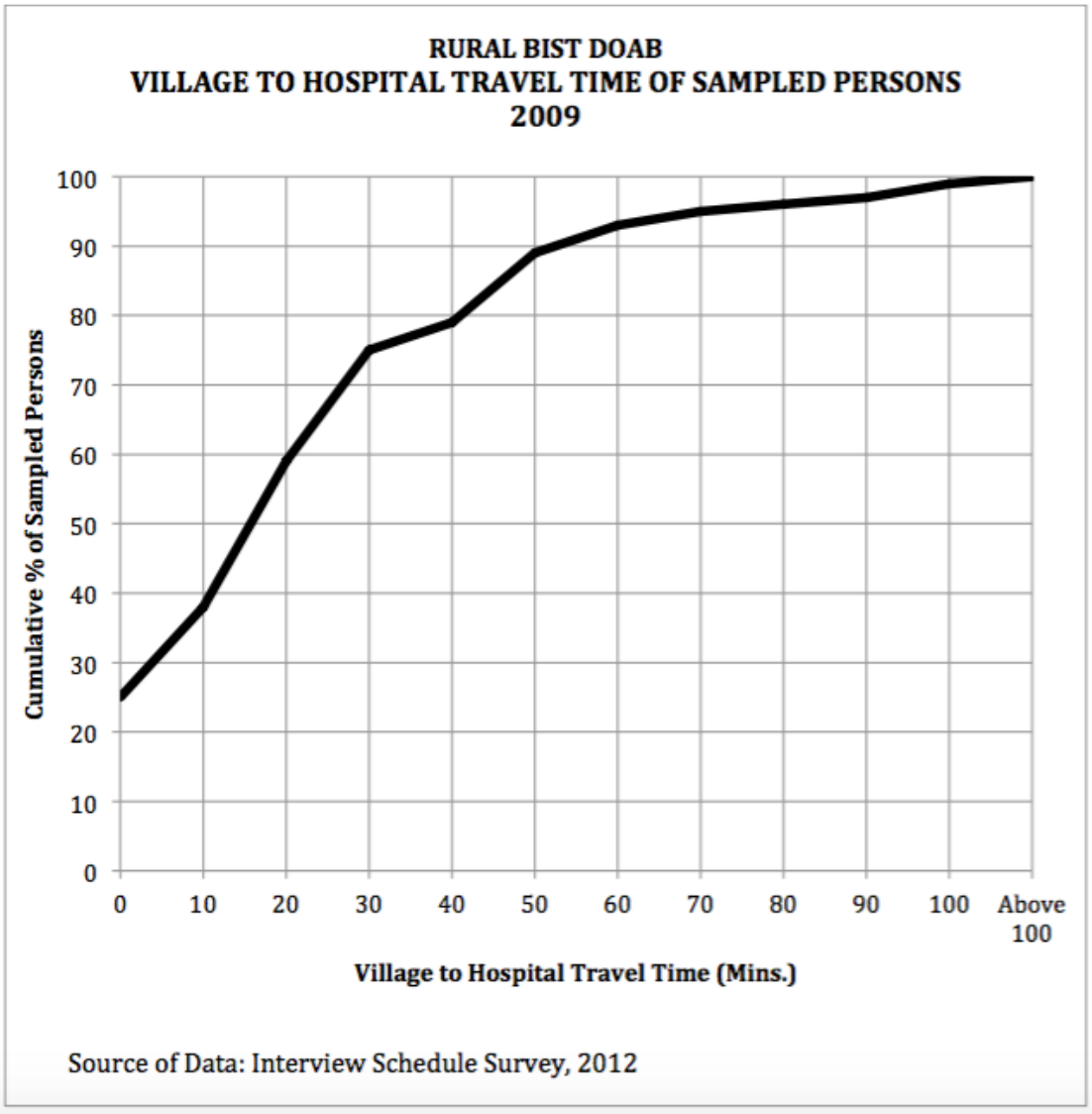

Fig 4 - Rural Bist Doab: Village to Hospital Travel Time of Sampled Persons

The cumulative graph of village to hospital travel time shows that around 20% of the sampled persons had a travel time of upto 20 minutes, 80% had to travel upto 40 minutes and 90% had a travel time of upto 50 minutes to reach the hospital for seeking medicine (Fig 4). The average travel time from villages of the sampled persons to the hospital of their medication was 27 minutes.

Medical Emergency Response System

The Punjab Health Systems Corporation has operationalized medical emergency response system in the state under which ambulance services are provided free of cost to the people. In Bist Doab, there are a total of 45 ambulances, out of which 19 are in district Jalandhar, 14 are in Hoshiarpur, 17 in Kapurthala and 5 in Nawanshahar. The district-wise allocation is based on the criteria of providing one vehicle within 30 minutes reaching time for rural areas and 20 minutes for urban areas from the designated health care institutions. Each of these ambulances serves around 1,06,010 persons (both rural and urban), which is fairly close to the national norm of one ambulance per lakh population. Thus the emergency transport services provided to the patients in the study region are quite adequate to meet the needs of the population.

Conclusion

The study reveals that Bist Doab region has good ambulance service for transferring the emergency cases of cardiovascular diseases, however the density of major roads is very low along the eastern border of the region (due to undulating hilly area) and the extreme western margins of the study area. These areas of low density of major roads have lower level of geographic accessibility to health care institutions.The average distance travelled by the sampled persons for seeking medication for cardiovascular diseases was 22 km. The mean travel time from villages of the sampled persons to the hospital of their medication was 27 minutes. New hospitals with specialized facilities should be established to reduce distance travelled by cardiovascular patients for seeking medical treatment. This should be done especially in areas where density of government health institutions is low, like Mukerian and Hajipur blocks (having uneven hilly terrain), eastern parts of block Bhunga, Hoshiarpur-II and Mahilpur (all situated along the Shiwalik hills), and SultanpurLodhi block in the west. The density of motorable roads should also be increased in unfavourable areas to improve accessibility to health care services.

References

Brabyn, L., & Skelly, C. (2002). Modeling population access to New Zealand public hospitals. *International Journal of Health Geographics*, 1(1), 3.

Guagliardo, M. F. (2004). Spatial accessibility of primary care: concepts, methods and challenges. *International Journal of Health Geographics*, *3*(1), 3.

Hare, T. S., &Barcus, H. R. (2007). Geographical accessibility and Kentucky's heart- related hospital services. *Applied Geography*, *27*(3), 181-205.

Jordan, H., Roderick, P., Martin, D., & Barnett, S. (2004). Distance, rurality and the need for care: access to health services in South West England. *International Journal of Health Geographics*, *3*(1), 21.

Morrissey, K., Clarke, G., Ballas, D., Hynes, S., &O'Donoghue, C. (2008). Examining access to GP services in rural Ireland using microsimulation analysis. *Area*, *40*(3), 354-364.

Robson, E. (2000). Invisible carers: young people in Zimbabwe's home-based healthcare. *Area*, *32*(1), 59-69.

Saini, A. K. (2014). Association between Educational Level and Cardiovascular Mortality in Bist Doab Region (Punjab, India).*International Journal of Research in Social Sciences*, *4*(3), 637-646.