Spatial-Temporal Dynamics and influencing Factors of Health Human Resources in Guangxi Counties: Insights from the MGWR Model

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Background

The allocation structure of health human resources is directly related to the quality and efficiency of health service provision.

Health human resources play a crucial role in improving the overall quality of health services and the long-term development of the healthcare system.

The scarcity and imbalanced distribution of high-quality health resources not only pose a threat to the lives and health of the people, but also increase the burden on patients' families and disrupt social stability.

The driving mechanism for determining the regional distribution of health human resources in grassroots cities is a prerequisite for subsequent optimization of health policies and management.

Objectives

Our aim is to analyze the spatial changes in health human resources in county-level cities in Guangxi, China.

We attempt to construct an optimal analytical model to analyze the driving mechanisms and key variables of spatial heterogeneity in healthcare human resources.

We attempt to provide data support and quantitative basis for formulating reasonable strategic health decisions.

Methods

The trend of changes in health human resources in 111 county-level cities in Guangxi from 2009 to 2010 was depicted on a time scale.

We calculated the spatial dependence of health human resources through the Moran index.

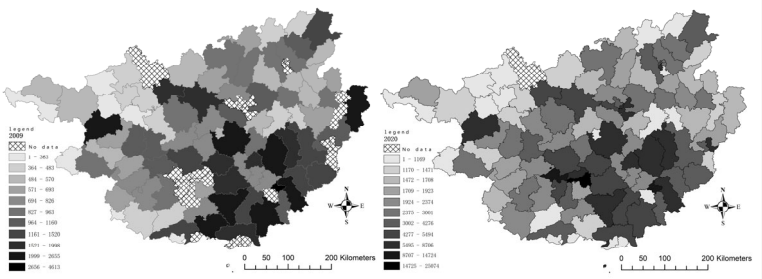
We analyzed the spatial heterogeneity of health human resources by calculating the nuclear density index.

We conducted a visual analysis of the spatial change trend of health human resources by drawing a spatial standard deviation ellipse.

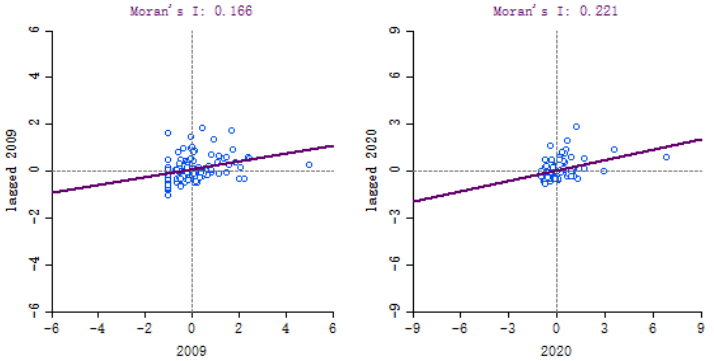
We constructed a multi-scale geographic weighted regression model (MGWR) with the best fit to identify key variables that affect its spatial heterogeneity.

Results

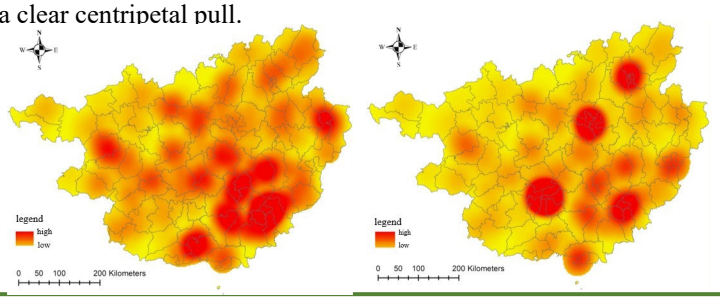
1. Our insights unveiled a robust growth in health human resources, from 245,600 in 2009 to 472,200 in 2020.



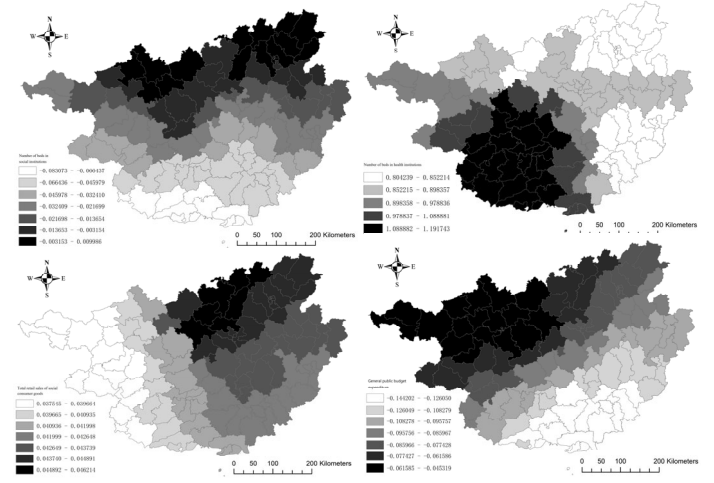
2. This talent influx exhibited a pronounced spatial agglomeration, intensifying over the period (Moran index for 2020: 0.221, p=0.003).



3. A pivot from single-region to multi-point distribution was discernible. The predominant spatial trajectory followed a "southwest to northeast" vector, indicating increased dispersion yet a clear centripetal pull.



4. Key determinants shaping these dynamics:
beds in health establishments (0.890, p<0.001),
beds in social work institutions (-0.061, p=0.072),
social consumer goods retail sales (0.122, p=0.016),
general public budgetary expenditure (-0.132, p=0.017).



Conclusion

With stark disparities in the growth rate and allocation of health resources at Guangxi's county level, there's a pressing need to synchronize developments between grassroots medical and social work entities. Central cities' high-caliber health assets should be leveraged to harmonize regional disparities. By finetuning county-level governance, the macro health policies' transmission effect can be maximized, thereby enriching grassroots health service accessibility.