



Temporal Shifts in Mental Health Resource Equity and Efficiency in Guangxi, China: A 2015-2021 Assessment

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BACKGROUND:

Mental health is a critical global public health issue today and a significant influencing factor on social stability and development. In various regions of China, there are issues of insufficient and imbalanced allocation of mental health resources, contributing to a substantial mental health burden caused by mental disorders. In this overarching context, the rational allocation of existing mental health resources and the enhancement of efficiency in mental health resource allocation while emphasizing the fairness of mental health services have become current focal points of attention.

OBJECTIVES:

The “National Mental Health Work Plan (2015-2020)” and the “Guangxi Mental Health Work Implementation Plan (2016-2020)” sought to shape mental health resource allocation in Guangxi. This research offers an evaluative lens into the efficiency and equity transformations across this timeline, intending to inform subsequent mental health governance in Guangxi and comparable regions.

METHODS:

We engaged a trifold methodological approach: harnessing the DEA model to scrutinize efficiency shifts, and the Gini coefficient alongside the concentration index to parse equity changes in mental health resource allocation from 2015 to 2021 in Guangxi. Data pertaining to mental health institutions, available facilities, and licensed personnel informed this analysis. Spatial differentials were visually captured via ArcGIS 10.8, rendering concentration level distributions.

RESULTS :

Our juxtaposition between 2015 and 2021 elucidated two central themes: A noteworthy enhancement in resource allocation equity by 2021 vis-à-vis 2015, albeit marred by persistent regional imbalances. The efficiency landscape, conversely, demonstrated an overall regression since 2015, albeit sporadic pockets of growth. A spatial overview painted a higher resource concentration gradient within central and southern precincts, dwindling towards the northeastern and southwestern axes, with Nanning, Guigang, and Yulin emerging as core hubs.

1. Evaluation and Comparison of the Efficiency of Mental Health Resources in Guangxi in 2015 and 2021

From an overall perspective, the comprehensive efficiency of mental health resource allocation in Guangxi is showing a declining trend.

Serial Number	Region	2015				2021			
		Overall Efficiency	Pure Technical Efficiency	Scale Efficiency	Economies of Scale	Overall Efficiency	Pure Technical Efficiency	Scale Efficiency	Economies of Scale
1	Nanning City	1	1	1	Constant	1	1	1	Constant
2	Liuzhou City	0.964	1	0.964	Decreasing	0.974	1	0.974	Decreasing
3	Guilin City	1	1	1	Increasing	0.852	1	0.852	Decreasing
4	Wuzhou City	0.727	0.735	0.989	Decreasing	0.538	0.547	0.985	Decreasing
5	Beihai City	0.734	0.752	0.975	Increasing	0.722	0.799	0.904	Increasing
6	Fangchenggang City	0.282	1	0.282	Increasing	0.363	1	0.363	Increasing
7	Qinzhou City	1	1	1	Constant	1	1	1	Constant
8	Guigang City	1	1	1	Constant	0.774	1	0.774	Decreasing
9	Yulin City	0.871	1	0.871	Decreasing	0.745	1	0.745	Decreasing
10	Baise City	1	1	1	Constant	0.524	0.56	0.937	Decreasing
11	Hezhou City	0.814	1	0.814	Increasing	0.315	0.5	0.629	Increasing
12	Hechi City	0.474	1	0.474	Increasing	0.548	0.63	0.928	Decreasing
13	Laibin City	0.34	0.75	0.453	Increasing	0.255	0.455	0.562	Increasing
14	Chongzuo City	1	1	1	Constant	1	1	1	Constant
Mean		0.8	0.946	0.844		0.689	0.821	0.832	

2. The Gini Coefficients of Various Mental Health Resources in Guangxi in the Years 2015 and 2021

Compared to the year 2015, there has been a noticeable improvement in the equity of mental health resource allocation in 2021.

Category	2015		2021	
	Land Area	Population	Land Area	Population
Number of Healthcare Facilities	0.39	0.19	0.32	0.14
Number of Hospital Beds	0.47	0.26	0.37	0.17
Number of Practicing (Assistant) Physicians	0.46	0.30	0.39	0.15
Number of Nurses	0.45	0.30	0.37	0.16

RESULTS :

3. Concentration of Mental Health Resources in Guangxi and the HRAD/PAD Ratio

The study reveals that, compared to 2015, there has been a significant improvement in equity in 2021. However, there remains a notable range of disparities. A comparison between equity based on population allocation and equity based on land area allocation indicates that the fairness in population-based allocation is significantly superior to that in land area-based allocation.

Table 1: Concentration Level of Mental Health Resources and the HRAD/PAD Ratio in Guangxi in the Year 2015.

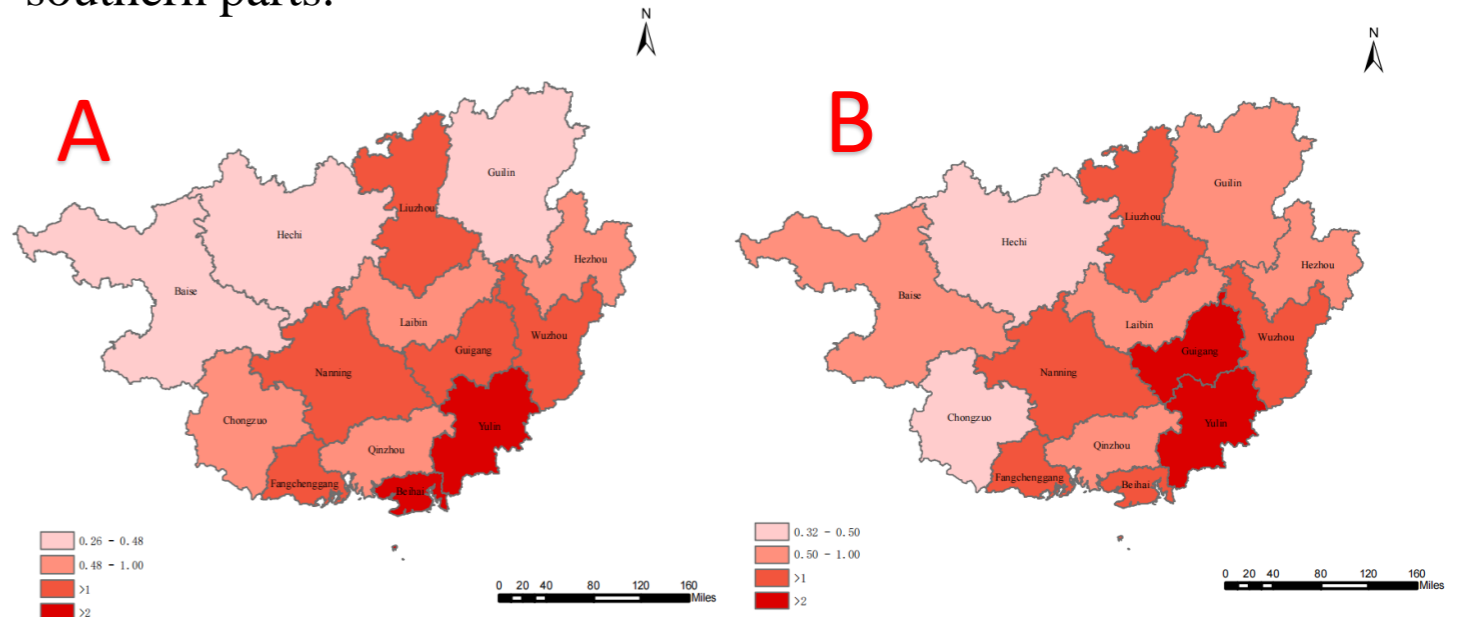
Region	PDA	Number of Medical Institutions		Number of Beds		Number of Practicing (Assistant) Physicians		Number of Nurses	
		HRAD	RATIO	HRAD	RATIO	HRAD	RATIO	HRAD	RATIO
Nanning City	1.70	1.96	1.15	1.95	1.15	2.81	1.65	2.65	1.56
Liuzhou City	1.05	1.09	1.04	1.56	1.50	1.79	1.71	1.83	1.75
Guilin City	0.86	0.42	0.48	0.59	0.69	0.67	0.78	0.87	1.01
Wuzhou City	1.12	1.84	1.64	2.17	1.93	2.08	1.85	2.08	1.85
Beihai City	2.47	3.47	1.40	5.51	2.23	2.94	1.19	4.82	1.95
Fangchenggang City	0.75	1.39	1.87	0.60	0.81	0.63	0.84	0.41	0.54
Qinzhou City	1.45	0.80	0.55	1.33	0.91	0.84	0.58	0.80	0.55
Guigang City	1.97	1.36	0.69	1.11	0.56	0.49	0.25	0.47	0.24
Yulin City	2.17	2.70	1.24	2.86	1.32	2.19	1.01	1.66	0.76
Baise City	0.48	0.48	0.99	0.25	0.51	0.44	0.92	0.40	0.84
Hezhou City	0.83	0.98	1.18	0.33	0.40	0.33	0.40	0.41	0.50
Hechi City	0.50	0.26	0.52	0.36	0.72	0.24	0.49	0.33	0.66
Laibin City	0.77	0.86	1.12	0.57	0.74	0.76	0.98	0.58	0.75
Chongzuo City	0.58	0.67	1.14	0.21	0.35	0.15	0.26	0.13	0.23

Table 2: Concentration Level of Mental Health Resources and the HRAD/PAD Ratio in Guangxi in the Year 2021.

Region	PDA	Number of Medical Institutions		Number of Beds		Number of Practicing (Assistant) Physicians		Number of Nurses	
		HRAD	RATIO	HRAD	RATIO	HRAD	RATIO	HRAD	RATIO
Nanning City	1.89	1.64	0.87	1.51	0.80	2.10	1.11	2.19	1.16
Liuzhou City	1.06	1.12	1.06	0.92	0.87	1.10	1.04	1.12	1.05
Guilin City	0.84	0.72	0.85	0.50	0.59	0.58	0.69	0.48	0.57
Wuzhou City	1.06	1.58	1.48	1.45	1.37	1.46	1.38	1.53	1.44
Beihai City	2.21	1.93	0.87	2.46	1.11	2.06	0.93	2.01	0.91
Fangchenggang City	0.80	1.06	1.32	0.63	0.79	0.54	0.68	0.44	0.56
Qinzhou City	1.43	0.71	0.49	1.30	0.91	1.11	0.78	0.99	0.69
Guigang City	1.94	2.39	1.23	2.81	1.45	3.03	1.56	2.73	1.41
Yulin City	2.14	2.14	1.00	2.77	1.30	2.15	1.00	1.88	0.88
Baise City	0.47	0.64	1.37	0.44	0.95	0.39	0.84	0.57	1.23
Hezhou City	0.81	0.94	1.15	0.86	1.06	0.61	0.75	0.74	0.90
Hechi City	0.48	0.43	0.89	0.59	1.23	0.52	1.08	0.55	1.14
Laibin City	0.73	0.90	1.23	0.92	1.26	0.80	1.09	0.76	1.04
Chongzuo City	0.57	0.32	0.56	0.20	0.36	0.20	0.36	0.19	0.34

4. The Spatial Distribution and Comparison of Concentration Levels of Mental Health Resources in Guangxi in the Years 2015 and 2021

The overall spatial distribution pattern in 2021 has not undergone significant changes compared to 2015. It remains predominantly concentrated in the central, eastern, and southeastern regions, displaying a gradual increase from the northern to the central and southern parts.



Note: Due to space limitations, only the spatial distribution maps of a specific indicator (Number of Medical Institutions) for the years 2015 and 2021 are presented here.

Figure A represents the concentration of mental health institutions in the year 2015, while Figure B depicts the concentration of mental health institutions in the year 2021.

CONCLUSION :

To bridge these identified lacunae, there's an exigency for government-led architectural recalibration: holistic planning, tightened regulatory oversight, and strategic resource positioning. Instituting a robust support mechanism can galvanize the languishing regions, compressing the identified equity chasm. Concurrently, hospital managerial prowess must be fortified, with a pronounced emphasis on nurturing human capital.