Journal of Social Work and Science Education
Volume 6 (3) 2025, 1545-1558
E-ISSN 2723-6919, P-ISSN 2746-0827

Unequal Distribution of Health Workers in South Kalimantan: Implications for Policy and Budget Planning

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Article History: Received on 28 June 2025, Revised on 5 August 2025, Published on 22 September 2025

Abstract: Health workforce data is an essential foundation for planning and evaluating a region's health system. Analysis of the distribution and composition of health human resources (HR) in South Kalimantan reveals patterns of spatial inequality and the dominance of certain professions. This reseacrh aims to explore the implications of HR data on the quality of health program planning and budgeting at the provincial and district/city levels. Results indicate that the concentration of human resources in urban areas, the dominance of nursing and midwifery professions, and the shortage of several other HR professionals require targeted policy interventions. Contribution the research include strengthening equitable distribution policies, investing in education and training, and needs-based budgeting to achieve optimal coverage and quality of health services.

Keywords: Health HR, Health Planning, Health Budget

A. Introduction

The availability, distribution, and composition of an adequate health workforce is a fundamental pillar in achieving the Sustainable Development Goals (SDGs), particularly Target 3.c. This target emphasizes the importance of increasing health sector funding and the recruitment, development, training, and retention of health workers (WHO, 2017). However, the distribution of health workers remains a global challenge, including in Indonesia, where health workers are concentrated in urban areas and referral health facilities, while rural and remote areas experience shortages.

The fulfillment of human resources for health is inseparable from the integration of the overall health system. A strong health system reflects efficient program planning and sound budget allocation. (World Health Organization, 2007) states that health program planning is a systematic process that includes problem identification, goal setting, development of intervention strategies, and determination of success indicators. In this regard, the budget preparation process is a crucial stage in translating these plans into specific financial allocations, thereby supporting the implementation of real health activities (Primo Braga & Vincelette, 2010).

The uneven distribution of healthcare workers is a crucial issue in Indonesia's healthcare system. As stated by the Indonesian Ministry of Health (2017), the concentration of medical personnel in urban areas creates unequal access to healthcare services, especially for communities in remote areas. This hampers the achievement of public health indicators, as areas with a shortage of healthcare workers cannot provide optimal services (Chen et al., 2012).

Data-driven healthcare workforce planning is crucial for local governments to determine appropriate intervention priorities. (Johar et al., 2018) states that an approach based on human resource gap analysis is the primary foundation for addressing healthcare worker shortages in remote areas. The availability of budget allocations according to priorities is also crucial for the success of various health programs, such as stunting prevention and strengthening healthcare facilities (Rizqi et al., 2023). According to (Zakirova et al., 2021) the budget also serves as a control instrument to ensure the efficient use of public funds and accountability to financial regulations.

Health in South Kalimantan suffers from an unequal distribution of healthcare workers and facilities, resulting in limited access to services in remote areas. Addressing this requires data-driven health planning and strengthening equitable budget allocation to ensure equitable access to healthcare services, even in remote areas. In response to national challenges, the South Kalimantan Provincial Health Office has prioritized the development of quality health human resources in the Regional Medium-Term Development Plan (RPJMD) (Yuningsih et al., 2024). xPlanning for health workforce needs in the province emphasizes health information systems, equitable distribution, and improving the competency of health workers. The South Kalimantan Provincial Media Center (2024) noted that without comprehensive, evidence-based planning, health workforce governance cannot function optimally.

Theoretically, the Human Capital approach states that human resources are a strategic asset that can be developed through investments in training, continuing education, and welfare incentives (Barbazza et al., 2015). This approach emphasizes the importance of increasing the capacity of health workers to boost service quality and improve the efficiency of health care organizations. Meanwhile, the Resource-Based View (RBV) theory states that an organization's competitive advantage lies in its ability to effectively manage internal resources, including human resources (Lubis, 2022). In the context of health workforce governance, the RBV approach emphasizes the importance of strategic management and integration between health care units to improve service performance.

Data from "South Kalimantan in Numbers" provides an in-depth overview of the distribution and composition of healthcare workers across the province's 13 districts/cities. This data allows for analysis of distribution patterns and identification of gaps that should be a key focus in planning and budgeting. This study fosters

strategic discussions between local governments, educational institutions, and health organizations in developing policies to improve healthcare human resource capacity based on local needs.

The interconnectedness of healthcare human resource availability, program planning, and budgeting underscores the importance of strategic, data-driven governance for equitable healthcare services. South Kalimantan can serve as an example for implementing a systemic and measurable approach to addressing the disparity in healthcare distribution and sustainably achieving the SDGs in the health sector.

This study aims to address the gap in healthcare workforce distribution in South Kalimantan by using local data as a basis for policy. Data from "South Kalimantan in Numbers" provides a detailed overview of the distribution and composition of healthcare workers in 13 districts/cities. This analysis allows for more accurate identification of distribution patterns and imbalances, allowing local governments to prioritize interventions based on evidence, not assumptions. Therefore, this study is expected to bridge the gap between healthcare workforce availability and access to healthcare services through policies that are based on local data, relevant to the South Kalimantan context, and aligned with the SDGs.

B. Methods

This research method employed an observational design, utilizing secondary data sourced from South Kalimantan in Figures. The data collected were human resources (HR) for health in South Kalimantan. The analysis used was descriptive analysis of the data, followed by a discussion supported by theoretical studies. This study uses a quantitative approach with descriptive methods. Descriptive methods were chosen because they aim to provide a systematic, factual, and accurate picture of the facts and characteristics of a specific population or study area, without involving causal hypothesis testing (Creswell, 2014; Sugiyono, 2011). In this context, the study will describe in detail the distribution and composition of health workers in each district/city in South Kalimantan Province.

Data Source

The primary data used in this study is secondary data sourced from the official publication "South Kalimantan in Figures" published by the Central Statistics Agency (BPS) of South Kalimantan Province in 2025. The publication "South Kalimantan in Figures" is a comprehensive statistical data source that contains various demographic, economic, social, and health indicators across all districts/cities in South Kalimantan. The specific data to be used include: (1) Number and type of health workers per district/city. (2) Demographic data related to the population in the districts/cities of South Kalimantan. (3) Reliability of BPS data is considered the official and most valid data for regional statistics in Indonesia, as it is collected through a standardized and

verified methodology (BPS, 2023). (4) The availability of BPS data that is easily accessible to the public, guarantees transparency and replication of the study. (5) Relevance of BPS data specifically provides aggregate data at the district/city level that is in line with the focus of this study.

Data collection technique

Data were collected using documentation techniques. The steps are as follows: (1) Access and download the 2025 publication "South Kalimantan in Figures" from the official website of the Statistics Indonesia (BPS) of South Kalimantan Province (https://kalsel.bps.go.id/). (2) Identify and extract data on the number and type of health workers per district/city from the relevant tables in the publication. (3) Identify and extract supporting data, namely the number of residents per district/city from the same publication. (4) Analyze the data descriptively.

Research Instruments

The main research instrument is a data table that is already available in the publication "South Kalimantan in Figures" in 2025. We used this table format as a reference for data presentation and analysis.

Data Analysis Techniques

The data analysis technique used is descriptive statistical analysis. The analysis steps to be carried out include (1) Tabulation of data that has been extracted from "South Kalimantan in Figures" will be presented again in the form of a table, organizing the number of health workers per type of profession and per district/city. (2) Frequency and Percentage Calculation (a) Calculating the number of health workers for each type of profession in each district/city and the total in South Kalimantan. (b) Calculating the percentage of each type of profession to the total health workers in the province. (3) Calculation of the ratio of health workers per 1,000 or 10,000 residents for each type of profession in each district/city. This will provide a more accurate picture of the density of health workers relative to the population (World Health Organization, 2007). (4) The results of the presentation of data analysis will be presented in the form of descriptive narratives and tables to visualize the distribution and composition of health workers. (5) Interpretation of data findings based on visible patterns, identifying the concentration of workers in certain areas, observing the dominance or scarcity of types of professions, and highlighting existing disparities between regions. This interpretation will form the basis for a more in-depth discussion of the data's implications for program planning and health budgeting in South Kalimantan. This descriptive analysis aims not to draw causal conclusions, but rather to provide a comprehensive and objective picture of the health workforce situation in South Kalimantan based on available data (Putri et al., 2022).

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C. Result and Discussion

Descriptive Results of Population and Health Human Resources in South Kalimantan

The research results are taken from secondary data from South Kalimantan in Figures 2025.

Table 1. Population in Regencies/Cities of South Kalimantan Province

Regency/Municipality	Population (thousand people)		
	2020[1]	2024[2]	2025[2]
(1)	(2)	(3)	(4)
Regency			
1. Tanah Laut	348,13	364,98	368,91
2. Kotabaru	324,71	343,68	348,25
3. Banjar	563,36	600,64	609,64
4. Barito Kuala	311,82	330,99	335,65
5. Tapin	188,90	198,87	201,20
6. Hulu Sungai Selatan	227,33	238,78	241,53
7. Hulu Sungai Tengah	258,17	268,75	271,23
8. Hulu Sungai Utara	226,32	237,11	239,64
9. Tabalong	252,48	266,89	270,30
10. Tanah Bumbu	321,49	342,36	347,26
11. Balangan	129,89	138,12	140,09
Municipality			
1. Banjarmasin	658,02	668,76	670,84
2. Banjarbaru	251,98	273,47	278,80
South Kalimantan	4.062,58	4.273,40	4.323,33

Source: BPS South Kalimantan, 2025

Table 1 shows the population growth trend in South Kalimantan over the past five years (2020–2025), from 4,062.58 thousand in 2020 to 4,323.33 thousand in 2025. This increase is equivalent to 6.43% in five years, or an average annual growth rate of approximately 1.26%. This population is influenced by births, deaths, and in-migration. Banjarmasin City will have the largest population in 2025, and Balangan Regency will have the smallest population.

Healthcare human resources are a key pillar of the healthcare system. The availability, affordability, and equitable distribution of human resources will determine the quality of services received by the community. South Kalimantan Province, as a region with complex geographic characteristics (hilly, coastal, and riverine areas), requires a data-driven and contextual approach to human resource planning.

Table 2. Number of Health Human Resources in Districts/Cities of South Kalimantan Province

Regency/City	Medical personnel[1]	Clinical Psychology	Nursing Staff	Midwifery Staff	Pharmaceutical Workforce	Community Health Workers	Environmental Health Worker	Nutritional Power	Physical Therapy	Medical Technical Personnel	Biomedical Engineering Staff
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Regency											
1. Tanah Laut	165	4	662	511	155	52	56	75	9	75	118
2. Kotabaru	146	–	509	463	147	126	56	84	4	55	83
3. Banjar	271	9	1.214	682	244	116	70	126	25	150	204
4. Barito Kuala	108	–	350	364	69	51	31	49	3	40	56
5. Tapin	96	1	424	334	104	58	35	55	8	64	80
6. Hulu Sungai Selatan	164	7	631	365	170	57	39	84	9	112	107
7. Hulu Sungai Tengah	140	2	691	411	134	69	53	83	8	68	103
8. Hulu Sungai Utara	78	2	465	340	96	66	42	81	6	57	87
9. Tabalong	139	1	555	324	158	50	39	59	18	73	114
10. Tanah Bumbu	186	1	708	711	159	81	25	57	8	52	110
11. Balangan	71	–	328	336	83	52	33	37	4	52	66
Municipality											
1. Banjarmasin	979	16	2674	707	782	184	104	177	63	317	532
2. Banjarbaru	334	6	1023	395	354	126	73	83	49	178	267
South Kalimantan	**2.877**	**49**	**10.234**	**5.943**	**2.655**	**1.088**	**656**	**1.050**	**214**	**1.293**	**1.927**

Note: 1 Medical personnel consist of doctors, dentists, specialist doctors, and dental specialist doctors both in Indonesia and abroad who are recognized by the Indonesian Government in accordance with statutory regulations (Law No. 29 of 2004 concerning Medical Practice)
Source: BPS Kalsel, 2025.

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E-ISSN 2723-6919, P-ISSN 2746-0827

Table 2 shows the distribution of health human resources across districts/cities. The most abundant type of health human resources in South Kalimantan are nursing staff, with the largest number in Banjarmasin City and the smallest in Balangan Regency. The least abundant type of health human resources in South Kalimantan is clinical psychology, with the largest number in Banjarmasin City, and those lacking are in Kotabaru, Barito Kuala, and Balangan Regencies. In addition to the types of health human resources listed in the table, data from the South Kalimantan Statistics Agency (BPS) (2025) also shows that all districts/cities in South Kalimantan do not yet have traditional health workers. The 2025 data on health human resources in South Kalimantan depicts a picture of unequal distribution, dependence on cities, and shortages of certain types of human resources, such as clinical psychologists and health promotion workers. Restructuring the placement system, training based on regional needs, and evidence-based budget allocation are urgently needed. Therefore, a performance audit of human resource-based services is necessary, not only based on the number of human resources, but also on workload, types of services, and public health outcomes.

Analysis of the Number and Ratio of Health Workers per Population in South Kalimantan (Assumed Health Worker Data for 2024)

An analysis of the ratio of health human resources to the population in each district/city is necessary to comprehensively assess the availability of health human resources. Based on 2024 health worker data and using the population data for South Kalimantan in 2024, the following figures are presented:

1. Total Health Workforce and Provincial Ratio
   a. Total Population of South Kalimantan 2024: 4,273,400 people.
   b. Total Medical Personnel (Doctors) in the Province: 2,877 people.
      Ratio of Medical Personnel per 1,000 population: $(2,877/4,273,400)\times1,000=0.67$ doctors per 1,000 population. This calculation is based on the WHO Standard of 1 doctor per 1,000 population for basic services..
   c. Total Provincial Nursing Personnel: 10,234 people.
      Nursing Personnel Ratio per 1,000 population: $(10,234/4,273,400)\times1,000=2.39$ nurses per 1,000 population.
   d. Total Provincial Midwifery Personnel: 5,943 people.
      Midwifery Personnel Ratio per 1,000 population: $(5,943/4,273,400)\times1,000=1.39$ midwives per 1,000 population.

   At the provincial level, the doctor-to-doctor ratio remains below the WHO-recommended minimum standard, indicating a general shortage of doctors in South Kalimantan. Meanwhile, the nurse-to-midwife ratio appears better, indicating relatively adequate availability of basic services.

2. Variation in the Ratio of Health Workers per Regency/City
   Analysis of the ratio per district/city will further highlight significant inequalities.:
   a. Banjarmasin City:
      Population 2024: 668.76 thousand people (668,760 inhabitants). Medical personnel: 979 people. Ratio: (979/668,760)×1,000=1.46 doctors per 1,000 inhabitants. This figure is far above the provincial average and approaches or exceeds WHO standards, indicating a good availability of doctors in the city center. Nursing personnel: 2,674 people. Ratio: (2,674/668,760)×1,000=4.00 nurses per 1,000 inhabitants.
   b. Banjarbaru City:
      Population in 2024: 273.47 thousand people (273,470 people). Medical personnel: 334 people. The ratio: (334/273,470)×1,000=1.22 doctors per 1,000 people, which is also good, indicating adequate availability in the second city..
   c. Banjar Regency:
      Population 2024: 600.64 thousand people (600,640 inhabitants). Medical personnel: 271 people. Ratio: (271/600,640)×1,000=0.45 doctors per 1,000 population. This figure is far below the WHO standard and the provincial average, even though Banjar Regency has the largest population among other regencies. Nursing personnel: 1,214 people. Ratio: (1,214/600,640)×1,000=2.02 nurses per 1,000 population.
   d. Barito Kuala Regency:
      Population in 2024: 330,990 people (330,990). Medical personnel: 108. Ratio: (108/330,990)×1,000=0.33 doctors per 1,000 people. This represents one of the lowest doctor ratios, indicating a significant shortage.
   e. Balangan Regency:
      Population in 2024: 138,120 people (138,120). Medical personnel: 71. Ratio: (71/138,120)×1,000=0.51 doctors per 1,000 residents. This ratio is higher than Barito Kuala, but still far from optimal..

Analysis of Health Workforce Distribution in South Kalimantan

Concentration of Health Workers in Urban Centers

Data clearly shows that Banjarmasin and Banjarbaru are magnets for healthcare workers in South Kalimantan. Banjarmasin, as an economic hub, has a significantly higher number of medical (979), nursing (2,674), pharmacy (782), and medical technician (317) personnel than other districts. This concentration aligns with the urban attraction theory, which offers better educational facilities, career opportunities, and infrastructure for healthcare workers (de Villiers Scheepers et al., 2023). Banjarbaru, although smaller than Banjarmasin, also shows significant numbers across various categories, confirming its role as a healthcare hub within the urban agglomeration.

The implication of this concentration is unequal access to quality healthcare in rural and remote areas. Residents in districts with fewer healthcare workers, such as Barito Kuala, Hulu Sungai Utara, or Balangan, are more likely to face challenges in accessing healthcare. This situation can lead to disparities in healthcare services between regions, a crucial issue requiring strong policy intervention (Shadmi et al., 2020).

Variations and Disparities at the District Level

While there are significant differences between urban and rural areas, variations are also evident within districts. Banjar Regency stands out for having the highest number of nursing personnel (1,214) among other districts, indicating a relatively strong primary care capacity. However, other districts, such as Barito Kuala, have relatively low numbers of healthcare workers across almost all categories. This disparity can be further analyzed by comparing the number of healthcare workers to the population or disease burden in each district. Without demographic and epidemiological data, it is difficult to determine whether the number of healthcare workers is proportional. However, intuitively, the number of healthcare workers in Barito Kuala (108) or Balangan (71) seems significantly limited to serve the district's population. This disparity has the potential to hinder the achievement of Universal Health Coverage (UHC) and Sustainable Development Goals (SDGs) targets in these regions (UN, 2015).

Analysis of Health Workforce Composition Based on Profession

Dominance of Nursing and Midwifery Personnel

Cumulatively, nursing (10,234) and midwifery (5,943) personnel dominate the health workforce in South Kalimantan. This reflects the central role of these two professions in health services, particularly in nursing care, maternal and child health (MCH) services, and family planning programs (WHO, 2010). The high number of nurses and midwives is a crucial asset for strengthening promotive and preventive efforts in the community, as well as case management in primary health facilities. This dominance also needs to be viewed from the perspective of the need for a balanced health system. While important, excessive focus on one or two professions without strengthening others can create a "bottleneck" or imbalance in the system (Bokrantz et al., 2024).

Scarcity of Specialist and Supporting Professions

Data shows very limited numbers for several crucial professions: (a) Clinical Psychology (49): This very low number indicates that access to mental health services, counseling, and psychological rehabilitation remains very limited in South Kalimantan, even though mental health issues are increasingly recognized as a significant global burden of disease (WHO, 2019). (b) Physical Therapy (214): The limited number of physical therapists indicates that medical rehabilitation services for

patients with physical disabilities or post-injury are still inadequate, which can impact patients' quality of life and independence. (c) Traditional Health Workers (0): Data shows the absence of traditional health workers recorded in South Kalimantan in Figures 2025. This could mean two things: (1) these professions have not been fully integrated into the official registration system, or (2) their numbers are indeed very low in formal health facilities (WHO, 2002). The scarcity of these types of health human resources highlights the need for strategic investment in education, training, and incentives to attract individuals to these fields. Without a balance of professions, the health system will struggle to provide holistic and comprehensive services to the community..

Implications of the Health Human Resources Ratio

The Health Human Resources ratio analysis illustrates the distribution of health human resources in South Kalimantan. The concentration of doctors and other health workers in Banjarmasin and Banjarbaru creates pockets of good health services, while most districts, especially those with large populations such as Banjar Regency, or other districts with smaller populations such as Barito Kuala and Balangan, face a shortage of medical personnel relative to their population. This ratio gap has a direct impact on: (a) Service Accessibility: People in areas with a low ratio will have difficulty accessing health services. Phenomena that can occur include long queues, long waiting times, and the possibility of referral to larger cities. (b) Service Quality: High workloads on limited health workers can reduce the quality of services. (c) Achievement of Health Indicators: A shortage of essential health workers in rural areas can hinder the achievement of health indicator targets such as reducing maternal and child mortality, controlling infectious diseases, and immunization coverage. (d) System Sustainability: A health system cannot function optimally if human resources are not evenly distributed according to the needs of the population (World Health Organization, 2007).

This imbalance demands a more optimal planning and budgeting approach to equitable distribution of health workers. Strategies that focus solely on increasing the total number of health workers without considering spatial distribution will be ineffective in addressing existing disparities.

Implications for Health Program Planning and Budgeting

This health worker data has implications for the quality of health program planning and budget preparation in South Kalimantan.

Evidence-Based Planning and Needs

(a) Gap Identification: This data serves as evidence to identify areas and types of services that are short of health workers. Program planning should focus on placing

workers in remote and border areas, as well as strengthening scarce professions. (b) Priority Setting: By understanding the composition of the workforce, local governments can prioritize recruitment, education, and training programs. For example, investment in the education of clinical psychologists or physical therapists will be a priority to meet unmet service needs according to the needs of each region. (c) Integration with Other Data: Health worker data needs to be integrated with demographic data (population, density), epidemiological data (disease burden, prevalence), and health facility data (number of community health centers, hospitals) to conduct a more accurate analysis of health worker needs (World Health Organization, 2007).

Efficient and Fair Budgeting

Some explanations relating to the availability and distribution of health human resources with budget preparation are: (a) Budget Allocation for Recruitment and Retention: Budgets should be allocated for recruitment programs that attract health workers to difficult-to-find areas, including financial incentives, housing facilities, or clear career paths (Cosgrave, 2020). Funds should also be available for retention programs that ensure health workers remain in their assigned areas. (b) Investment in Education and Training: The health education budget should be expanded to support study programs for scarce professions and for capacity building through ongoing training for all professions, including funding for scholarships and educational infrastructure. (c) Performance-Based Budgeting: The government can adopt a performance-based budgeting approach, where funding allocations to community health centers or hospitals are linked to the achievement of service targets supported by the availability and performance of health workers (Randa & Adere, 2025). (d) Budget Monitoring and Evaluation: Health worker data is also crucial for monitoring the effectiveness of budget expenditures. One evaluation is whether investments in recruitment and training are resulting in the expected increase in the number and distribution of health workers. Regular evaluation is also crucial to ensure accountability (August et al., 2022).

Capacity Building and Collaboration

Some approaches that can be taken to support the adequacy and development of health human resources include: (a) Sustainable Human Resource Development: This data underscores the importance of a sustainable human resource development program for health, encompassing recruitment, education, placement, and retention. (b) The Role of the Provincial and Regency Governments: The South Kalimantan Provincial Government can act as a coordinator and facilitator, while the regency/city governments are responsible for implementing the program in their respective regions, tailored to the specific needs of each region. Collaboration between levels of government and with educational institutions is crucial. (c) Supporting Regulations and Policies: Strong policies are needed to promote equity, such as mandatory

placement policies for new graduates or special programs for disadvantaged, frontier, and outermost (3T) regions.

D. Conclusion

South Kalimantan population data from 2020 to 2025 shows a growth of 6.43% or an average of 1.26% per year, increasing from 4,062.58 thousand people (2020) to 4,323.33 thousand people (2025). Banjarmasin City has the largest population (670.84 thousand people), while Balangan Regency has the smallest (140.09 thousand people). This population increase directly impacts the increasing need for health services and health human resources capable of reaching all levels of society, both in urban and rural areas. Health human resource data in South Kalimantan reflects the complexity of health human resource management. The concentration of personnel in urban areas and the imbalance in the composition of professions require a strategic response from the local government. The quality of health program planning and budgeting in South Kalimantan is highly dependent on the ability to utilize human resource data, and improving the quality of human resources through formal education, technical training, and sustainable development programs to address evolving public health challenges. By investing in equitable distribution, strengthening scarce professions, and transparent, needs-based budgeting, South Kalimantan has the potential to build a more resilient and responsive health system. These efforts will directly contribute to improving access, quality, and equity of health services for all its residents, in line with the national and global health development vision.

E. Acknowledgement

We thank to all friends from Universitas Islam Malang (UNISMA) who support us in this project.

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