

## ABSTRACT

The distribution of health workers is a crucial factor in determining the equity and quality of healthcare services. Unequal distribution across regions can lead to disparities in access to healthcare, making analysis necessary to understand its distribution patterns. However, most previous clustering studies have not considered spatial aspects that may influence regional conditions. This study aims to apply the Fuzzy Geographically Weighted Clustering (FGWC) method to classify regencies and municipalities in Central Java Province based on the number of health workers in 2024, as well as to identify clustering patterns by incorporating geographical factors. The variables used include the number of nurses, midwives, pharmacists, and doctors. The results indicate that the optimal parameters were obtained at a certain level of fuzziness with three clusters, yielding an Internal Fuzzy Validity (IFV) value of 0.7919, which demonstrates good clustering quality. The Fuzzy C-Means (FCM) method converged at the 25th iteration, while the FGWC method converged at the 100th iteration. A total of 21 regencies/municipalities, or 60% of the total regions, experienced cluster changes after incorporating spatial aspects, indicating the influence of geographical factors in the clustering process. The clustering results show that the regions can be classified into two main criteria of health workforce availability: high and low. FGWC method provides more representative clustering results by considering geographical proximity among regions, and it can serve as a basis for formulating policies aimed at achieving equitable distribution of health workers.

**Keywords:** Fuzzy Geographically Weighted *Clustering*, spatial analysis, health workforce, Central java