

Mapping 27 Region of West Java Province Based on Factors Affecting Malnutrition Cases in Toddlers in 2022 Using Multidimensional Scaling (MDS)

Hallen Naafi Aliya Rachman*¹, Nisa Akbarilah Putri² and Triyani Hendrawati³

^{1,2,3} Department of Statistics, Padjadjaran University, INDONESIA.
(E-mail: hallen21001@mail.unpad.ac.id, nisa21005@mail.unpad.ac.id,
triyani.hendrawati@unpad.ac.id)

ABSTRACT

Malnutrition is a condition in which the body lacks nutrients or its nutrition is below the average standard. Malnutrition usually occurs in toddlers and is manifested by a bulging abdomen and shrinking muscles. Malnutrition can affect the growth and intelligence of toddlers, negatively impacting the quality of the nation's next generation. At a more severe level, malnutrition can lead to death. Malnutrition in the toddlers is still a serious problem in many provinces in Indonesia, including West Java. The case in West Java in 2022 is that 3.3% of toddlers are still malnourished and 0.4% of toddlers suffer from malnutrition.

There is a statistical method to classify several objects based on the same characteristics, namely Multidimensional Scaling (MDS). In this study, 27 regencies/cities in West Java Province will be mapped based on 6 factors affecting malnutrition in toddlers in 2022, which will show how the similarity of regencies/cities is seen from the factors affecting malnutrition in toddlers. The result of the analysis is a two-dimensional map that illustrates the distribution of observation units based on the characteristics or variables measured. Groups of regencies/cities that are close together indicate that the conditions of malnutrition in toddlers in the region are almost the same, so that the countermeasures applied in the region can also be the same.

Based on the analysis, there are 4 groups of regencies/cities formed. The first group is Subang Regency and Purwakarta Regency. The second group is Majalengka Regency and Tasikmalaya City. The third group is Garut Regency and West Bandung Regency. The fourth group is Sukabumi Regency, Cianjur Regency, and Sukabumi City. The Stress value of 0.17% was obtained, meaning that the resulting map is in the perfect category, which indicates that this analysis has the right reliability and validity. An R-square value of 17.82% of the data variance can be explained by the model, meaning that the Multidimensional Scaling (MDS) model is acceptable for describing mapping. The results of this study can be used as information and reference in decision making by the West Java Provincial government, so that efforts to overcome malnutrition in West Java province are more effective and targeted.

Keywords: Health, Malnutrition, Multidimensional Scaling (MDS), Toddlers, West Java

Table 1. Stress and R-square Value

Goodness of Fit	Value
Stress	0,170039%
R-square	17,8278%

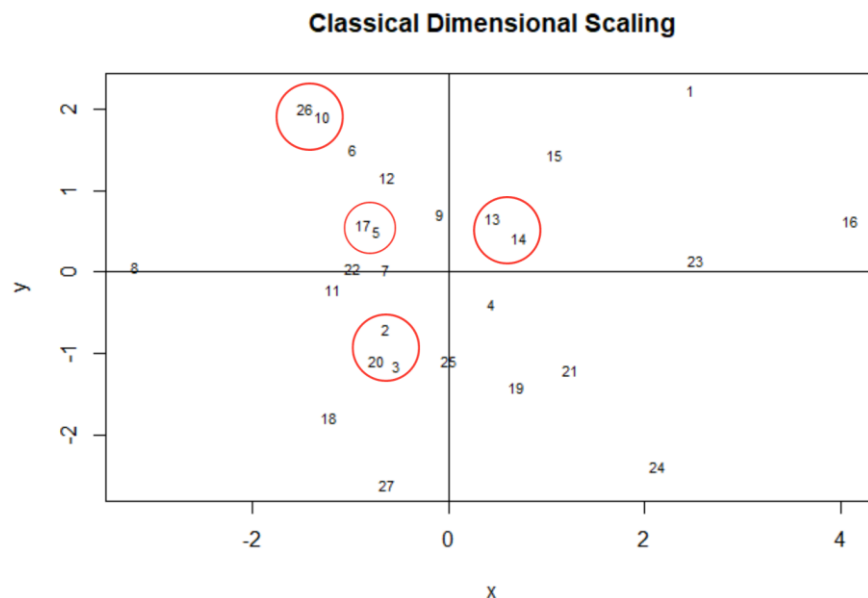


Figure 1. Mapping from Dimensional Scaling Analysis

References:

- [1] Unicef Indonesia. (2023). "Wasting (Gizi Kurang dan Gizi Buruk) dan Dampaknya pada Anak."
- [2] Dinas Kesehatan Jawa Barat. (2022). "Profil Kesehatan Jawa Barat 2022." Dinkes Jawa Barat.
- [3] Johnson, R. A., & Wichern, D. W. (2007). "Applied Multivariate Statistical Analysis," 6th ed. Pearson: Upper Saddle River, New York.
- [4] Renchern, A. C. (2007). "Methods of Multivariate Analysis," 2nd ed. John Wiley & Sons Inc: USA.
- [5] Primasasti, A. (2022). "Bedanya Stunting dan Gizi Buruk." Pemerintah Kota Surakarta.
- [6] Ayuputri, I., & Ratna, J. (2017). "Analisis Multidimensional Scaling (MDS) pada Faktor-faktor yang Mempengaruhi Balita Penderita Gizi Buruk pada Setiap Kecamatan di Surabaya."
- [7] BPS Provinsi Jawa Barat. (2022). "Persentase Penduduk Miskin." BPS Jawa Barat.
- [8] Eka, K. (2021). "Memodelkan Angka Gizi Buruk Di Provinsi Bali Dengan Pendekatan Regresi Spasial." *E-Jurnal Matematika*, 10(2).
- [9] Fatma, I. N., & Heri. (2013). "Pemodelan Faktor – Faktor Yang Mempengaruhi Balita Gizi Buruk Di Jawa Timur Dengan Pendekatan Regresi Spasial." Universitas Negeri Surabaya.
- [10] Holid, I., & Sihaloho, E. D. (2017). "Analisis Faktor-faktor yang Mempengaruhi Kasus Gizi Buruk pada Balita di Provinsi Jawa Barat: Studi Kasus Tahun 2012." *ISEI*

Economic Review, 1(1), 5-7.

[11] Irmawati. (2017). "Penerapan Analisis Multidimensional Scaling Pada Pemetaan Karakteristik Kemiskinan Di Provinsi Sulawesi Selatan." Skripsi. Fakultas Sains dan Teknologi, Program Studi Matematika, Universitas Islam Negeri Alauddin Makassar.

[12] Rizky, R. I. (2013). "Analisis Faktor-Faktor Yang Mempengaruhi Gizi Buruk Balita Di Jawa Tengah Dengan Metode Spatial Durbin Model," 2(4).