Survey of PM10 Values in Ambient Air and Mapping with GIS in Maragheh and Urmia City

Amir Mohammadi[1*], Zahra Adeli[2], Zahra Atafar[3], Mitra Sadrkhanlou[4], Nasim Partash[5,6]

[1]Social Determinants of Health Research Center, Clinical Research Institute, Urmia University of Medical Sciences, Urmia, Iran
[2]Student Research Committee, Urmia University of Medical Sciences, Urmia, Iran
[3]Research Center for Environmental Determinants of Health (RCEDH), Health Institute, Kermanshah University of Medical Sciences, Kermanshah, Iran
[4]Department of Midwifery, Urmia Branch, Islamic Azad University, Urmia, Iran
[5]Department of Midwifery, Maragheh University of Medical Sciences, Maragheh, Iran
[6]Department of Occupational Health and Safety Engineering, School of Public Health and Safety, Shahid Beheshti University of Medical Sciences, Tehran, Iran

OPEN ACCESS

***Corresponding Author:**
Social Determinants of Health Research Center, Clinical Research Institute, Urmia University of Medical Sciences, Urmia, Iran

Citation:
Mohammadi A, Adeli Z, Atafar Z, Sadrkhanlou M, Partash N. Survey of PM10 Values in Ambient Air and Mapping with GIS in Maragheh and Urmia City. *Iranian biomedical journal*. Supplementary (12-2024): 73.

ABSTRACT

Introduction: The present study monitored particulate matter smaller than 10 microns (PM10) in ambient air in Maragheh and Urmia Cities.
Methods and Materials: This study was conducted as a descriptive ecological study. A total of 30 sampling points were selected in each city, and PM10 values were measured using a portable dust measuring device. After determining the concentration of pollutants, mapping was performed using Arc GIS software to analyze the spatial trend of particulate matter in each city.
Results: The results showed that the seasonal mean concentration of PM10 in Maragheh City ranged from 12 to 16 µg/m^3, while in Urmia City, it ranged from 33 to 51 µg/m^3. Additionally, the summer and winter seasons exhibited higher pollution levels in Maragheh and Urmia, respectively. According to the World Health Organization guidelines established in 2021, which recommend a maximum of 15 µg/m^3 of PM10 over a 24-hour period, Maragheh City demonstrates cleaner air quality. In contrast, Urmia City experience unacceptable pollution levels on most days. An analysis of the spatial trends of PM10, based on pollutant mapping, revealed that pollution levels were higher at the city's entry and exit points, where traffic emissions are prevalent. In Urmia, the central, eastern, and western areas exhibited increased pollution due to vehicular traffic and fuel combustion during the cold months.
Conclusion and Discussion: This study demonstrates that PM10, a particulate matter associated with air quality, is significantly polluted in Urmia City, while the air quality in Maragheh was assessed as clean. The primary sources of these particles include vehicular traffic, the burning of fossil fuels, and dust carried by the wind. Therefore, additional research is recommended, along with the enhancement of green spaces and facilities.

Keywords: Air pollution, Particular matter, Spatial analysis

[Downloaded from ibj1.pasteur.ac.ir on 2026-10-20]

[DOI: 10.61186/ibj.25th-11th-IACRTIMSS]