



# Epidemiological Patterns and Mortality Trends of Hematological Malignancies in Babol, Northern Iran: A Nine-Year Population-Based Study (2013-2021)

Mohammad-Amin Ghezel<sup>1</sup>, Pouyan Ebrahimi<sup>1</sup>, Seyed-Hossein Hosseini-Berneti<sup>1</sup>, Amir-Hossein Lashkarbolouki<sup>1</sup>, Mohsen Karami<sup>2</sup>, Hossein-Ali Nikbakht<sup>3\*</sup>

<sup>1</sup>Student Research Committee, Babol University of Medical Sciences, Babol, Iran

<sup>2</sup>Infectious Diseases and Tropical Medicine Research Center, Health Research Institute, Department of Parasitology and Mycology, Babol University of Medical Sciences, Babol, Iran

<sup>3</sup>Social Determinants of Health Research Center, Health Research Institute, Department of Biostatistics and Epidemiology, School of Public Health, Babol University of Medical Sciences, Babol, Iran

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### \*Corresponding Author:

Social Determinants of Health Research Center, Health Research Institute, Department of Biostatistics and Epidemiology, School of Public Health, Babol University of Medical Sciences, Babol, Iran

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## ABSTRACT

**Introduction:** Hematological cancers, including leukemia, lymphoma, and myeloma, are a significant cause of mortality worldwide. This study aimed to investigate the crude and age-standardized mortality rates (ASRs) and trends of these cancers over nine years in Babol City, northern Iran. Understanding the epidemiological patterns and trends is crucial for devising effective public health strategies and allocating resources for disease control and prevention.

**Methods and Materials:** This cross-sectional study analyzed all registered deaths from hematological neoplasms in Babol City between 2013 and 2021. Data were obtained from the Health Deputy at Babol University of Medical Sciences, and causes of death were classified according to the International Classification of Diseases-10. Crude and ASRs were calculated using the direct standardization method and the global standard population provided by the International Agency for Research on Cancer. Trend analysis was performed using the Cochran-Armitage-Trend Test.

**Results:** In total, 357 deaths (10.8% of all cancer-related deaths) were attributed to hematological neoplasms, with an average age of  $61.9 \pm 19.3$  years. The crude and ASRs increased from 3.1 and 2.7 per 100,000 people in 2013 to 8.1 and 6.9 per 100,000 in 2021, respectively. With each successive decade of age, these trends significantly increased in both men ( $p < 0.001$ ) and women ( $p < 0.001$ ). A significant increasing trend was observed for non-Hodgkin's lymphoma ( $p = 0.033$ ), multiple myeloma ( $p = 0.002$ ), and leukemia ( $p < 0.001$ ), while the trend remained consistent for Hodgkin's lymphoma ( $p = 0.247$ ).

**Conclusion and Discussion:** This study reveals an alarming increase in hematological cancer mortality in Babol City, cutting across age and gender. The trends mirror global patterns while highlighting potential regional influences. Improved screening and control measures are imperative to counter this public health challenge. Further research into local risk factors is warranted to develop targeted interventions. Comprehensive national policies addressing prevention, early detection, treatment access, and palliative care are crucial. Regular monitoring of epidemiological data is necessary to guide resource allocation and evaluate the effectiveness of existing strategies. Multidisciplinary efforts integrating healthcare, public awareness, and research are needed to curb the rising burden of these malignancies in northern Iran.

**Keywords:** Hematologic Neoplasms, Iran, Leukemia, Lymphoma, Mortality

