EARTHQUAKES IN TURKEY (1915-2021)

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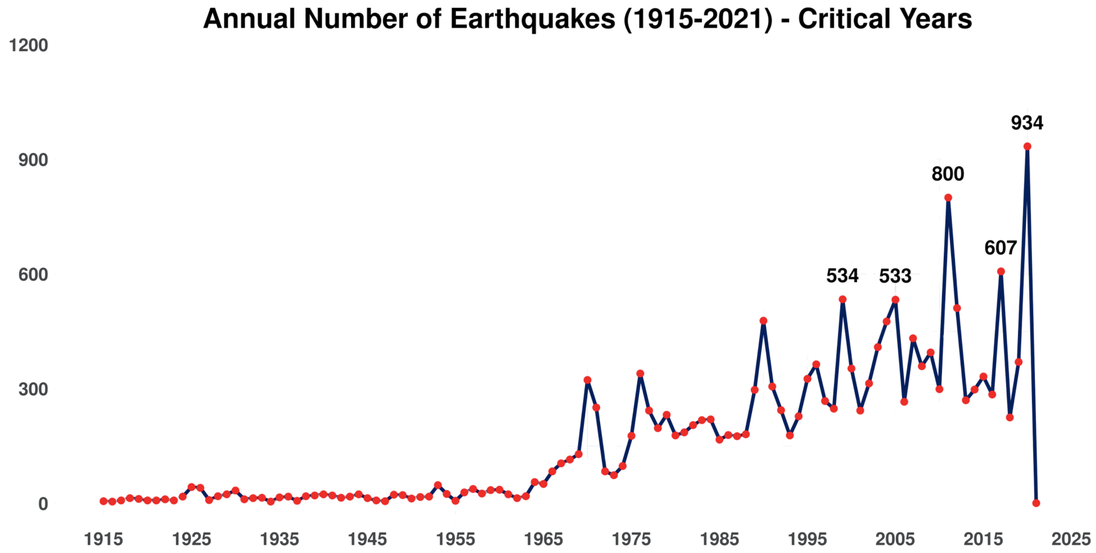
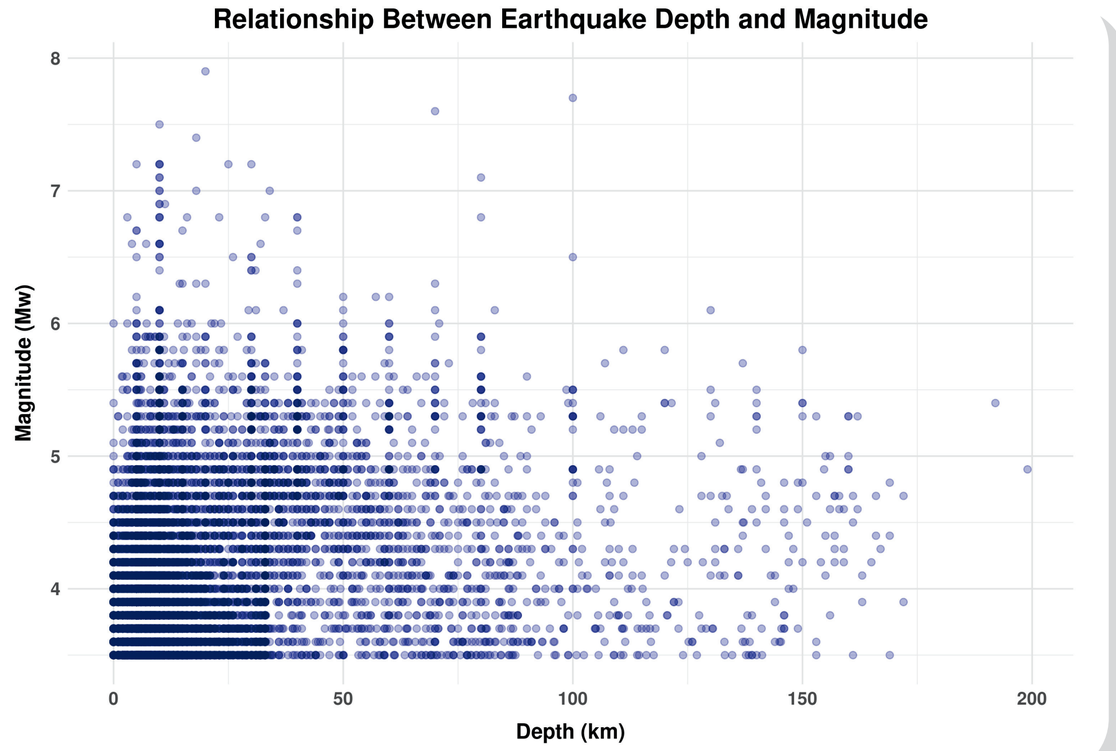
This study examines the seismic characteristics of Türkiye through a multi-dimensional approach, utilizing earthquake data spanning from 1915 to 2021. By analyzing temporal trends, geospatial densities, and depth-magnitude correlations, this research aims to provide a statistical foundation for identifying high-risk regions and supporting data-driven strategic planning processes.



Time-series analysis indicates a significant upward trend in recorded seismic activity in Türkiye from 1915 to the present. The dramatic increase observed especially after 1990, along with the peak points in years such as 2011 (Van) and 2020 (İzmir), reflects both the periodic intensification of seismic activity and the enhanced sensitivity in data collection technologies.

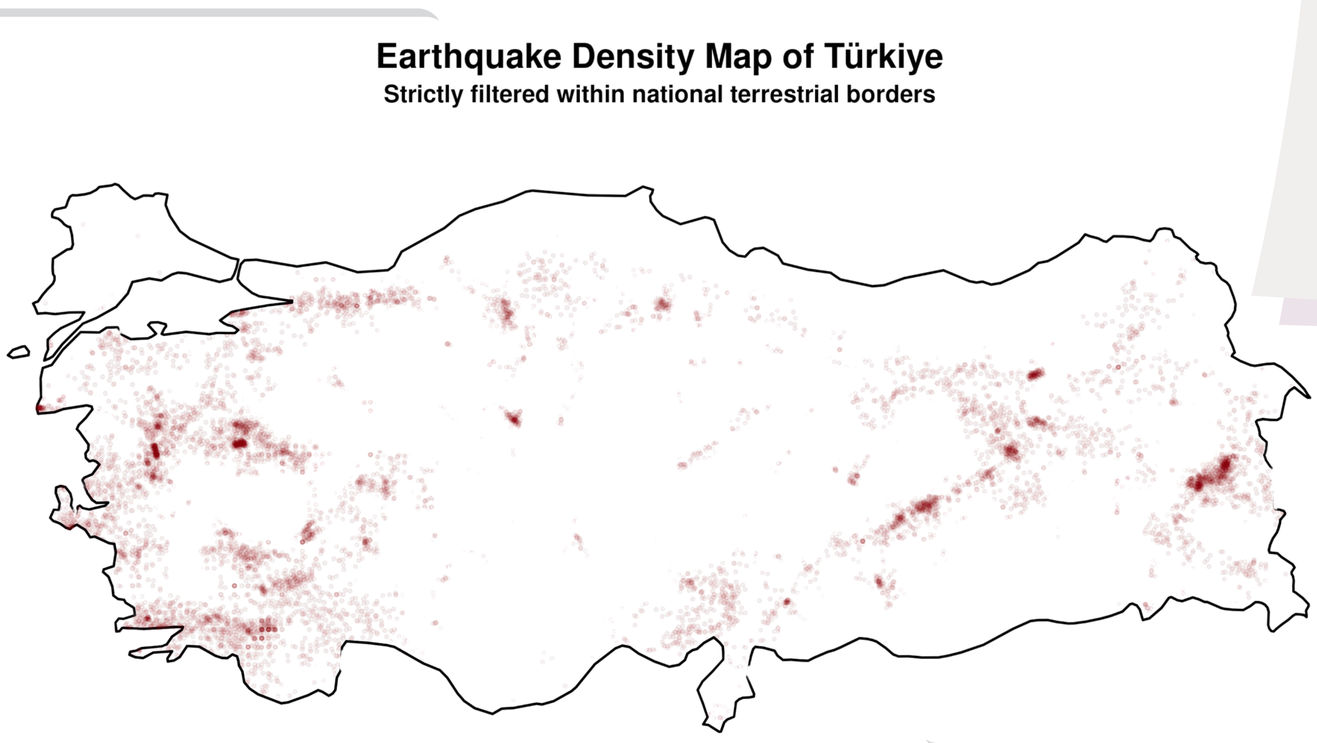


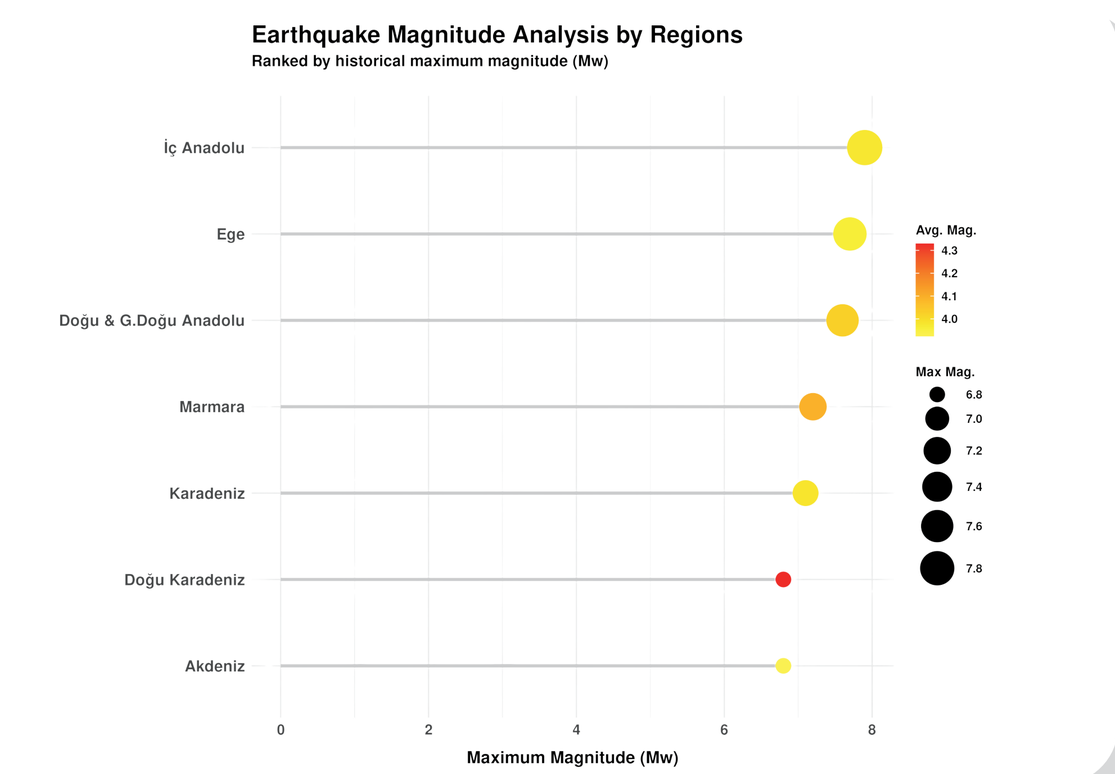
Depth and magnitude analysis indicates that the vast majority of earthquakes in Türkiye are shallow-focused (0-35 km). The data distribution proves that shallow earthquakes possess higher destructive potential and demonstrates a complex, non-linear correlation between magnitude and depth.

Conclusion

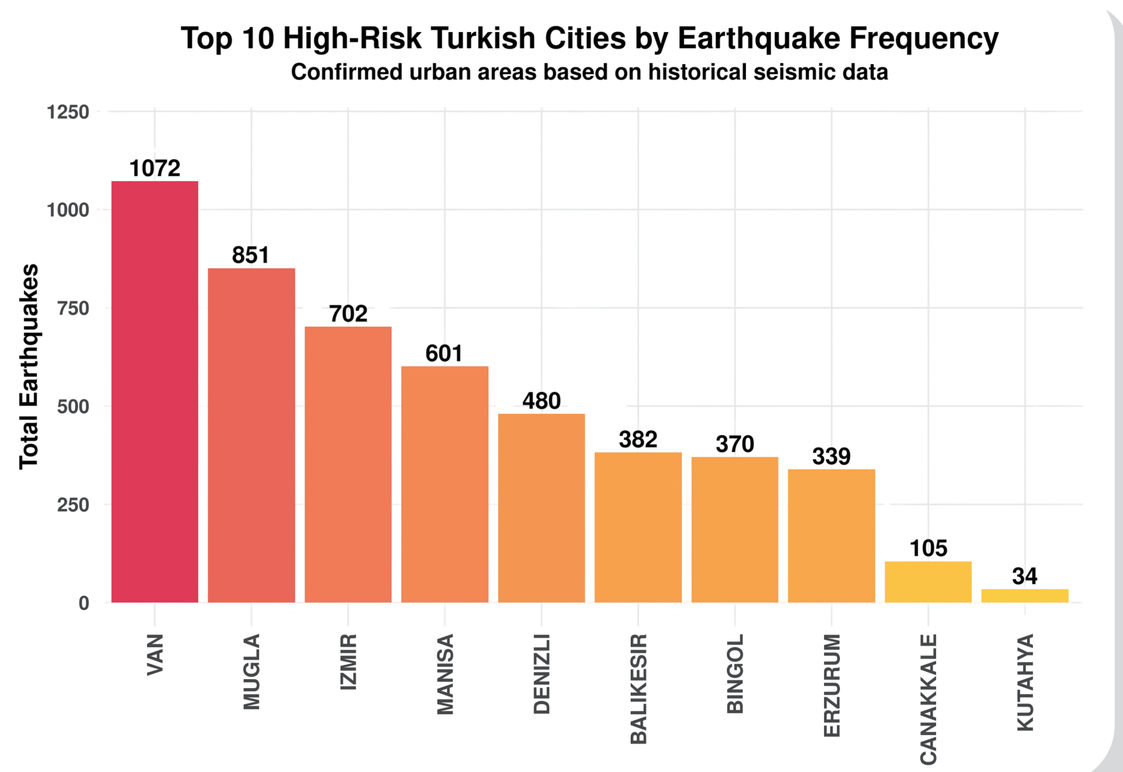
This comprehensive analysis of Türkiye's 1915-2021 seismic data reveals a significant upward trend in earthquake frequency over time. The geospatial distribution highlights critical clustering along major fault lines, particularly in high-risk cities like Van and Muğla. While regional magnitude analysis confirms heterogeneous seismic capacities across the country, depth-magnitude correlations emphasize the high destructive potential of shallow-focused tremors. Collectively, these findings provide a vital statistical framework for data-driven strategic planning.

Geospatial density analysis clearly demonstrates that seismic activity is clustered along Türkiye's major fault lines (NAF, EAF, and WAF). In particular, the high-density epicenters in the Aegean Region and the Marmara transition zone emphasize the continuity in the geographic distribution of seismic risk and the strategic importance of these regions.





Regional magnitude analysis reveals the seismic capacity of Türkiye's various geographical areas. While the Central Anatolia and Aegean regions stand out with both high average magnitudes and historical maximum intensity values, indicating the highest concentration of seismic energy accumulation; the Black Sea and Mediterranean regions differ with relatively lower magnitude profiles.



City-based frequency analysis demonstrates that seismic risk is not homogeneously distributed across Türkiye; provinces such as Van, Muğla, and İzmir exhibit the highest density in historical earthquake records. This data identifies the priority regions where efficient resource allocation and the enhancement of local-level earthquake preparedness capacities are required.