



Global Trends in Bridge Collapse Incidents in 2023: an Analysis of Regional Patterns and Causative Factors

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Abstract

Bridge collapses represent critical failures in infrastructure systems with significant implications for public safety, economic stability, and transportation networks. This paper presents an investigation into the occurrence of bridge collapse incidents worldwide during 2023. Drawing upon a dataset sourced from global news outlets, the study offers an analysis of regional trends and underlying causes, with a view to providing insights for design, construction, and maintenance practices. The study aggregates more than 170 incidents, enabling a reasonably detailed examination of the distribution of bridge collapses across different regions. The paper focuses on extracting statistical patterns and trends, revealing potential hotspots of collapse incidents that warrant further attention and preventive strategies. The findings underscore the urgency of adopting proactive measures to address structural vulnerabilities and systemic shortcomings, contributing to the overall resilience of transportation networks.

Keywords: bridge collapse, causative factors, infrastructure safety, scour, bridge engineering

1 Introduction

Bridges are generally important pieces of infrastructure, whether they be major crossings spanning hundreds of metres or simple footbridges linking remote communities. However, as is well understood, they are not infallible. Bridges collapse for a variety of reasons and when they do can be considerably disruptive, not only in terms of the immediate effects on human life but they can often lead to environmental and economic damage to communities.

This paper draws upon a dataset compiled from global news reports throughout 2023, sourced from various online portals. The dataset encompasses a total of 173 bridge collapses, spanning a spectrum of sizes and types, from simple pedestrian bridges linking communities in

remote areas to substantial pieces of critical infrastructure.

The paper looks at the data to extract statistical patterns and trends before looking to some actions that could be implemented to minimise future collapses. Climate change and structural health monitoring are also discussed in the paper. Case studies for collapses which garnered significant media attention during 2023 have also been included.

2 Summary of the Data

2.1 Data Collection

The data for this study was collected through systematic monitoring of online news sources. This was set up to track and gather information on