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Statistical Overview of Dengue Outbreaks in Bangladesh: Trends and Comparisons

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Abstract

Dengue fever is an infectious disease transmitted by Aedes mosquitoes which is emerging in Bangladesh causing very frequent attacks with an increasing tendency in the number of cases and fatalities these days. This necessitates immediate and effective preventive strategies. This research will unveil the structure and trend of dengue cases as well as deaths associated with them in Bangladesh between the years 2021-2024 along with seasonal variations and annual variations. Specific month by month analysis may show the periods of high burden and strengthen evidence-based recommendations of prevention and control measures. A quantitative analysis was conducted using monthly dengue case and fatality data from official government sources for 2021–2024. The study identifies seasonal and annual trends to highlight high-risk periods and offers insights into evidence-based public health interventions. The report indicates increases in cases and deaths due to dengue, during the peak months of August and September, around 77,000 cases and 274 deaths in September 2023, the highest in these periods of study. Where, in January 2021 it was 32 and zero respectively. Thus, these data indicate that dengue epidemics follow clear seasonal patterns. This research highlights the necessity of prevention strategies and interventions at critical periods like in August and September. Strengthening disease surveillance vector control programs and advanced arrangements form a basis for reducing morbidity and mortality offering critical insight into the management strategies that would be effective and sustainable in the control of dengue in Bangladesh.

Key-words:
Dengue, Bangladesh, Statistical Analysis, Research, vector-control.

Biographies

Md. Abu Talha is an undergraduate student in Computer Science at American International University, with a keen interest in technological development and robotics. His research focuses on applying cutting-edge solutions to advance the field of robotics and address real-world challenges. As a dedicated Computer Science student, he aspires to

contribute to projects that drive innovation and societal progress. His goal is to combine technical expertise with a vision for modern development, aiding in the creation of transformative technologies for a better future.
Md. Shaif Talukder is an undergraduate Computer Science student at American International University. He is passionate about technological innovations, with interests in mobile app development, public health, and socialization. Md. Shaif aims to design impactful solutions for real-world challenges and envisions contributing to transformative technologies that advance societal progress.

Tousi Akter is an undergraduate student in Computer Science at American International University, with a keen interest in software development, whether for mobile applications, web development. Her research focuses on developing techniques to protect individuals' privacy and secure data sharing methods. As a dedicated Computer Science student, she aspires to contribute to projects that drive innovation and societal progress. Her goal is to understand how new technologies such as IoT and cloud computing are shaping industries and to develop expertise in these areas as evolve.

Swapnil Saha is an undergraduate student in Computer Science at American International University, with a strong passion for artificial intelligence and robotics. His research centers on leveraging advanced AI technologies to push the boundaries of robotics and solve practical challenges. As a dedicated Computer Science enthusiast, he aims to contribute to innovative projects that promote technological progress and benefit society. His vision is to combine technical proficiency with creativity to develop transformative solutions that shape a smarter and more connected future.

Md. Golam Shahria Shakil is a Bachelor of Science in Computer Science and Engineering (CSE) student at American International University-Bangladesh. Passionate about technology and innovation, he is particularly interested in web development and aspires to specialize in ASP DOT NET Core. With a strong determination to master modern tools and frameworks, Shakil is dedicated to enhancing his skills to excel in the ever-evolving tech industry. His enthusiasm for learning and growth drives his ambition for a successful career in software development.

Mst. Nowrin Jahan Nuha is an undergraduate student in Computer Science at American International University, with a deep interest in cybersecurity. Her academic focus revolves around exploring advanced techniques to enhance digital security and protect against emerging cyber threats. As a committed Computer Science enthusiast, she strives to contribute to innovative solutions that strengthen technological resilience and safeguard critical systems. With a blend of technical expertise and a passion for security, her vision is to create a safer and more secure digital world for future generations.

Md. Mortuza Ahmmed is a Statistician and an Associate Professor in the Department of Mathematics at American International University-Bangladesh, Dhaka, Bangladesh. His research interests are application-oriented, focusing on the practical use of statistical techniques to enhance analysis accuracy and projection precision across diverse sectors. His primary academic focus spans public health, education, and machine learning. He is dedicated to empowering students with technical knowledge, enabling them to transform their ideas into tangible achievements, thereby fostering a progressive and modern society.