DATA VISUALIZATION : A CONCEPT IN FRONTEND BIO-INFORMATICS

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Github Repo: <https://github.com/Hussein648/hackbio-cancer-internship.git>

**DEFINITION**

Data Visualization is the graphical representation of data and information using visual elements such as graphs, charts, figures. In today's data-driven world, the ability to gather and analyze vast amounts of information has become crucial for businesses, researchers, and decision-makers. However, raw data alone can be overwhelming and challenging to comprehend. This is where data visualization steps in as a powerful tool to present complex data in a visually appealing and easy-to-understand manner. The goal of data visualization is to communicate data insights effectively and efficiently, enabling individuals to make informed decisions and gain valuable insights. Cancer is a large group of diseases that can start in almost any organ or tissue of the body when abnormal cells grow uncontrollably (W.H.O). The branch of medicine concerned with diagnosis and treatment of cancer is known as oncology.

Although the measurements of clinical outcomes for cancer treatments have become diverse and complex, there remains a need for clear, easily interpreted representations of patients’ experiences. Graphs and figures allow the illustration and visualization of data to demonstrate an intervention or treatment effect in oncology treatments. The ability to display data figuratively enables rapid interpretation of sometimes complex information. A relevant example of its application in oncology is the Kaplan-Meier curve. The Kaplan-Meier curve remains one of the most important visualizations for analysis of survival data in oncology. It allow for comparison of survival outcomes (eg, alive/dead, free of disease/relapsed) in different groups over time. This representation was established in 1958 by Edward L. Kaplan and Paul Meier, who published a seminal paper on how to deal with incomplete observations, for example, survival after an intervention in patients treated at different time points. Other examples include Forest plots, Violin plots and funnel plots used in illustrating treatment effects, waterfall plots and swimmer plots used in interpretation of tumour response.

**CONCLUSION**

Data visualization plays a pivotal role in transforming raw data into actionable insights. Its ability to simplify complex information, enhance engagement, and reveal patterns empowers decision-makers to make well-informed choice in healthcare as well as other aspects of life. To quote Edward Tufte, “The commonality between science and art is in trying to see profoundly—to develop strategies of seeing and showing”.

**REFERENCES**

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5017943/>

Goel MK, Khanna P, Kishore J. Understanding survival analysis: Kaplan-Meier estimate. Int J Ayurveda Res. 2010;1(4):274–278. [PMC free article] [PubMed]

Zachry M, Thralls C. An Interview with Edward R. Tufte. Tech Comm Quart. 2004;13(4):447–462.