ESTABLISHING GUIDELINES FOR DATA VISUALISATION IN HEALTHCARE

An International Review of Current Practices

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PROBLEM

Data dashboards can support public health decision-making by enabling realtime monitoring and surveillance, recognition of trends, aggregating diverse data sources and facilitating communication of health information with policymakers, clinicians, health service planners and the public. However, many healthcare dashboards do not reach their potential due to poor usability and ineffective data visualisations.

Public Health Dashboard

Summary



FINDINGS

Our review highlights a significant gap in healthcare data visualisation: **the lack of a standardised approach to developing healthcare dashboards**. While dashboards are widely acknowledged as vital tools for improving decision-making, communication, and efficiency, most research focuses on *building healthcare dashboards* rather than establishing robust guidelines to underpin their design and implementation. Through our analysis, we identified *Four Pillars of Healthcare Dashboard Development* — Approach, Content, Behaviour, and Adoption.



Approach User-Centred Design Iterative Development

Dashboard for the Chesapeake Health area, Virginia, USA. https://www.crisphealth.org/learning-system/crs/public-health-dashboard/

This review therefore aimed to identify best practice in healthcare dashboards creation by exploring the following research questions within the context of healthcare:

- What dashboards exist within national health systems that support decisionmaking?
- Are there good practice guidelines for the creation of such dashboards?
- Can we create good practice guidelines?

METHODS

This review searched for guidelines to develop healthcare dashboards using these steps:

- **1. Identifying Need**: Discussions with health professionals and a data visualisation expert highlighted the need for better data presentation in healthcare.
- 2. Literature Search and Screening: PubMed, EMBASE, SCOPUS, and IEEE Explore were searched using combinations such as "Data Visualisation" or "Data Dashboards" with "Healthcare" or "Health Infrastructure". The screening process is illustrated below.
- 3. Synthesis: Common themes were identified and grouped into pillars.

Needs and Task Analysis Co-Creation with Users Evaluation and Testing



Content

Relevant and Actionable Metrics Visual Best Practices Customisation and Flexibility Data Quality and Integration Transparency in Data Sources



Behaviour

Interactivity and Engagement Usability and Accessibility Customisation and Flexibility Support Diverse Literacy Levels Positive Reinforcement



Adoption

Workflow & Organisational Integration Stakeholder Engagement Scalability and Sustainability Cost-Effective Technologies Data Security and Privacy Monitoring and Evaluation

CONCLUSION & FUTURE WORK



- This review highlights the need for a standardised approach to data visualisation. The Four Pillars of Healthcare Dashboard Development— Approach, Content, Behaviour, and Adoption—highlight a pathway toward addressing this gap.
- However, the journey does not end here. By combining the evidence presented here with collective consensus-building and iterative testing, we will **develop in-depth guidelines** to inform the development of healthcare dashboards that will empower public health and other leaders to make informed, timely and effective decisions.











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