

# High quality, safe healthcare = technology + people + systems thinking

David Greenfield,<sup>1</sup> Usman Iqbal ,<sup>2,3</sup> Yu-Chuan (Jack) Li  <sup>4,5,6</sup>

**To cite:** Greenfield D, Iqbal U, Li Y-CJ. High quality, safe healthcare = technology + people + systems thinking. *BMJ Health Care Inform* 2022;**29**:e100673. doi:10.1136/bmjhci-2022-100673

Received 02 September 2022  
Accepted 07 September 2022



© Author(s) (or their employer(s)) 2022. Re-use permitted under CC BY-NC. No commercial re-use. See rights and permissions. Published by BMJ.

<sup>1</sup>School of Population Health, Faculty of Medicine and Health, University of New South Wales (UNSW), Sydney, New South Wales, Australia

<sup>2</sup>Global Health and Health Security Department, College of Public Health, Taipei Medical University, Taipei, Taiwan

<sup>3</sup>Health ICT, Department of Health, Hobart, Tasmania, Australia

<sup>4</sup>Graduate Institute of Biomedical Informatics, College of Medical Science & Technology, Taipei Medical University, Taipei, Taiwan

<sup>5</sup>Dermatology Department, Wan-Fang Hospital, Taipei, Taiwan

<sup>6</sup>International Association of Medical Informatics (IMIA), Geneva, Switzerland

## Correspondence to

Professor Yu-Chuan (Jack) Li; jack@tmu.edu.tw

The BMJ Health & Care Informatics presented two editors' choice papers examining two different, but related papers, focused on health professional's perspectives on if and how technology can improve care processes and delivery. The empirical study of Bowden *et al*<sup>1</sup> explored clinicians' perceptions of digital access to patients' past medical history (PMH) as a basis for justifying significant investment into shared electronic health records (SEHR). Bates *et al*<sup>2</sup> work reported a roundtable expert discussion on the challenges and future direction in smart medication management.

Bowden *et al* surveyed clinicians from the front line, those in emergency departments and providing urgent care. In these time critical environments, clinicians reported that access to PMH is imperative to be able provide a response that accounts for health status, current treatment regime and other health data related to the immediate presentation. Clinician's valued and wanted to obtain information from a trusted SEHR; there is a high level of technology acceptance. Five major suggested improvements were identified: increasing the number of patient records available; standardisation of information presentation; increased system reliability; expanded access to information and validation by authoritative/trusted sources. Two policy implications were identified: the need to focus on higher levels of patient participation; and, to ensure patient record curation and stewardship increasing the breadth and depth of information and processes.

Bates *et al* work records an expert discussion on the challenges and future direction in smart medication management. The key focus of the discussion was to reconsider the critical question: how can the original goal of improved healthcare quality and medication safety through electronic medical records be achieved? The challenges identified relate to established

individual behaviours and beliefs, defined care delivery systems, and inflexible service requirements. They suggest that improvements are to be found through addressing simultaneously four interrelated issues: digital and information technology systems; safe prescribing; communication and education of both clinicians and patients; and medication adherence.

Individually, and together, Bowden *et al* and Bates *et al* highlight the need for a whole of systems approach that encompasses all healthcare providers to develop, implement, evaluate and improve technology to enhance care processes and delivery. They bring to attention, once again, that end-user involvement, including the pressing need for increased patient involvement, will likely raise the uptake and success of technology driven improvements.<sup>3 4</sup> Each work promotes renewed recognition that addressing usability and human factors are critical to building safe and effective health systems and care delivery processes.<sup>5-7</sup>

**Twitter** Yu-Chuan (Jack) Li @jaak88

**Contributors** Initial conception design and drafting of the manuscript: DG, UI and Y-CL. Drafting the manuscript: DG and UI. Critical revision of the paper: DG, UI and Y-CL.

**Funding** The authors have not declared a specific grant for this research from any funding agency in the public, commercial or not-for-profit sectors.

**Competing interests** None declared.

**Patient consent for publication** Not applicable.

**Provenance and peer review** Commissioned; internally peer reviewed.

**Open access** This is an open access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 4.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited, appropriate credit is given, any changes made indicated, and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/4.0/>.

## ORCID iDs

Usman Iqbal <http://orcid.org/0000-0002-0614-123X>

Yu-Chuan (Jack) Li <http://orcid.org/0000-0001-6497-4232>



## REFERENCES

- 1 Bowden TC, Lyell D, Coiera E. Emergency department and urgent care clinician perspectives on digital access to past medical histories. *BMJ Health Care Inform* 2022;29:e100567.
- 2 Bates DW, Cheng H-Y, Cheung NT, *et al.* 'Improving smart medication management': an online expert discussion. *BMJ Health Care Inform* 2022;29:e100540.
- 3 Jacobsohn GC, Leaf M, Liao F, *et al.* Collaborative design and implementation of a clinical decision support system for automated fall-risk identification and referrals in emergency departments. *Healthc* 2022;10:100598.
- 4 Poncette A-S, Mosch LK, Stablo L, *et al.* A remote patient-monitoring system for intensive care medicine: mixed methods Human-Centered design and usability evaluation. *JMIR Hum Factors* 2022;9:e30655.
- 5 Carayon P, Hoonakker P. Human factors and usability for health information technology: old and new challenges. *Yearb Med Inform* 2019;28:071–7.
- 6 Di Pelino S, Lamarche L, Carr T, *et al.* Lessons learned through two phases of developing and implementing a technology supporting integrated care: case study. *JMIR Form Res* 2022;6:e34899.
- 7 Turner P, Kushniruk A, Nohr C. Are we there yet? Human factors knowledge and health information technology - the challenges of implementation and impact. *Yearb Med Inform* 2017;26:84–91.