

Technology-Mediated Adverse Events in Primary and Community Care

Chantelle Recsky, RN, PhD(c), Lorraine Blackburn, RN, MSN, Allison Muniak, MSc, Kathy Rush, RN, PhD, Maura MacPhee, RN, PhD, Leanne M. Currie, RN, PhD

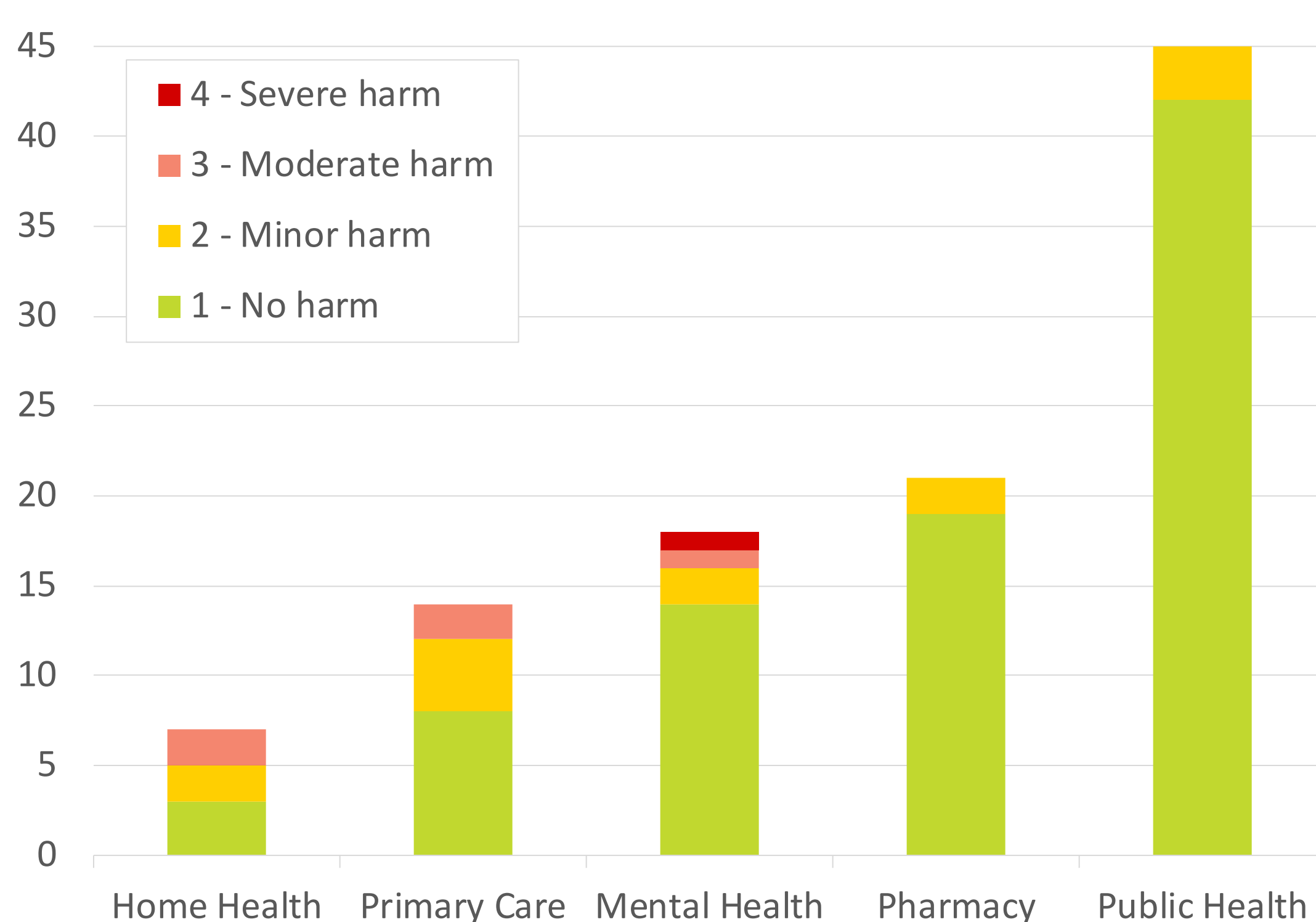
Background

A **technology-mediated adverse event** (TMAE) is a patient safety event with a potentially negative outcome in which health information technology played a role. The incidence of TMAE is increasing in parallel with high uptake of technology in healthcare^{1,2,3} Most TMAE research has been conducted in acute care settings. The **purpose of this study** was to examine rates of TMAEs in **primary and community care** settings.

Methods

This **cross-sectional study** was carried out in a Canadian healthcare region providing care for over 1 million people in urban and rural settings. Primary care is provided via an MD or NP. Community and public health care is provided at a clinic or the patient's home. A web-based tool for voluntarily reporting patient safety events has been used since 2009⁴. Reports include a narrative description, categorization of type, and degree of harm^{5,6}. In 2015, a screening question derived from Magrabi et al.,² was added: 'Was the computer system a factor in the event?'. We analyzed reports from primary and community care from Nov 1, 2016 to Oct 31, 2018. **Harm may be physical, mental, or emotional.** Harm is rated according to severity, with no harm being where an error reached the patient, but without effect, and minor harm causing a temporary effect, moderate harm requires an intervention, and severe harm results in suffering, permanent injury, and/or requires major medical treatment⁶.

Number of Cases by Setting and Harm

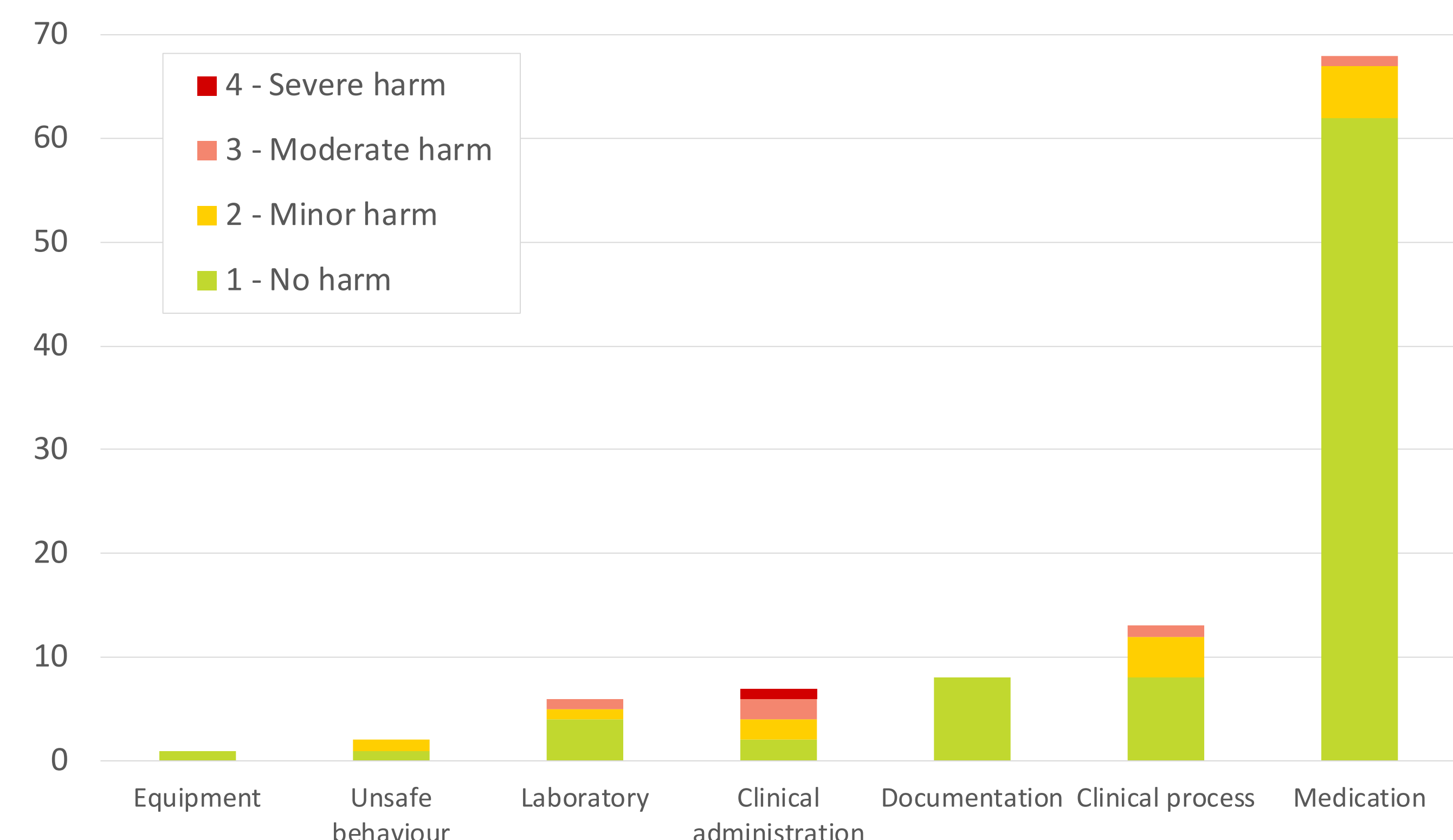


Was there an **incident or circumstance** that could have resulted, or did result, in **unnecessary harm** to a patient?

Was the **computer system** a factor in the event?

105 events were reported as "yes" over two years.

Number of Cases by Type and Harm



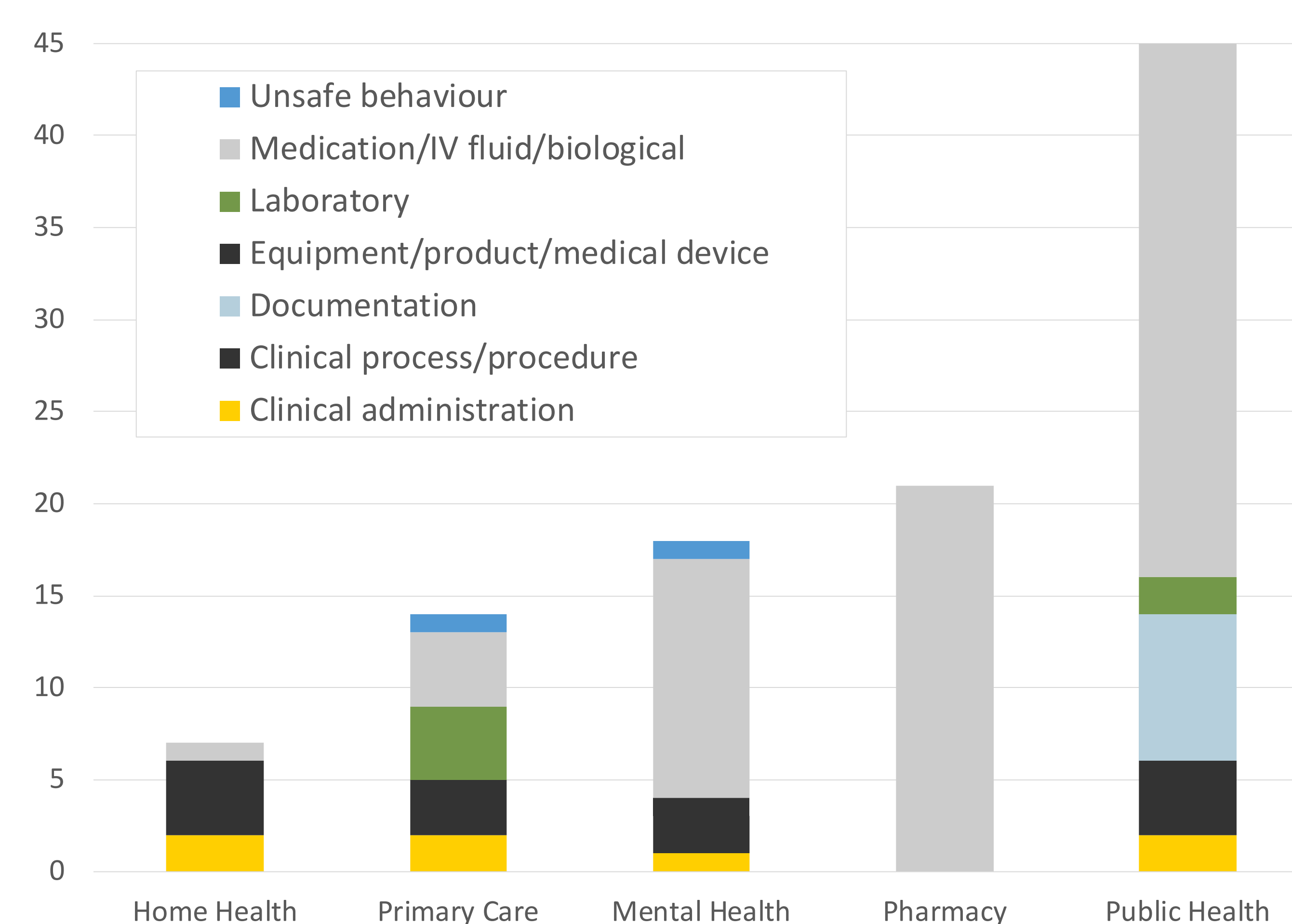
Example Cases

Specimens were sent to the lab. They were result, but never came through the **Primary Care** EMR so no one saw that the patient had a positive result for a reportable disease.

Home health services did not receive electronic notification of client's discharge home from hospital and the patient did not receive wound care as scheduled.

Inconsistencies between vaccine administration and electronic documentation, resulting in vaccines not given according to schedule in **Public Health**.

Number of Cases by Setting and Type



Results

Over 2 years, **105 events** were tagged as "yes" to the screening question. These reports were investigated and verified by local supervisors. Of these, 19 (18%) had harm attributed – minor (n=13), moderate (n=5), and severe (n=1). Medication events represented 65% of reported events (n=68) (e.g., vaccines). Among the different areas of care, public health had the most reported events (n=45, 43%), yet 93% (n=42) of these events indicated no harm. In contrast, 7% (n=7) of events were reported in home health, and more than half of events (n=4) in this setting indicated harm.

Discussion

To the authors' knowledge, this is the first study that reports on frequency of TMAEs in community care. Under-reporting and bias associated with self-reporting is a limitation. Qualitative data are being gathered and analyzed as another phase of this work. **Healthcare leaders need to be aware of the potential for harm related to advancing technologies in practice, and encourage recognition and reporting of TMAE⁵.** These findings will guide our health region to establish a process to identify, analyze, and address TMAE in non-acute settings.

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References

- Ash JS, Berg M, Coiera E. Some unintended consequences of information technology in health care: the nature of patient care information system-related errors. *J Am Med Inform Assoc.* 2004;11:104-12.
- Magrabi F, Ong MS, Runciman W, Coiera E. An analysis of computer-related patient safety incidents to inform the development of a classification. *J Am Med Inform Assoc.* 2010;17:663-70.
- Meeks DW, Smith MW, Taylor L, Sittig DF, Scott JM, Singh H. An analysis of electronic health record-related patient safety concerns. *J Am Med Inform Assoc.* 2014 Jun 20;21:1053-9.
- Cochrane D, Taylor A, Miller G, et al. Establishing a provincial patient safety and learning system: pilot project results and lessons learned. *Healthc Q.* 2009;12:147-53.
- Singh H, Sittig DF. Measuring and improving patient safety through health information technology: The Health IT Safety Framework. *BMJ Qual Saf.* 2016 Apr 1;25(4):226-32.
- BC Patient Safety and Learning System. Degree of harm: General definitions and examples. Vancouver: BCPSLS. Accessed November, 13, 2019.

