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What training and competencies are required for public health practitioners to support the digital transformation of public health? A rapid review

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Background

Public health practice and competency frameworks in Canada have not been updated to match the prominent role digital technologies (DTs) play in contemporary public health. Public health training institutions have struggled to integrate DTs in their curricula.

We aimed to identify training and practice competency recommendations that can enhance public health practitioners' capacity to support the digital transformation of public health functions.

Methods

This rapid review was conducted following Joanna Briggs Institute's and WHO's framework for rapid review.

Search: Systematic search conducted in December 2022, using **MEDLINE, EMBASE, ERIC and Web of Science.** Additional search on Google scholar and other websites to identify grey literature. Automated forward/backward citation searches of included articles using Citationchaser.

Screening and extraction: 25% of titles and abstract screened by 2 researchers (Figure 1). Data extracted using pre-tested extraction tool and matched to the 7 core competency categories for public health in Canada (2008).
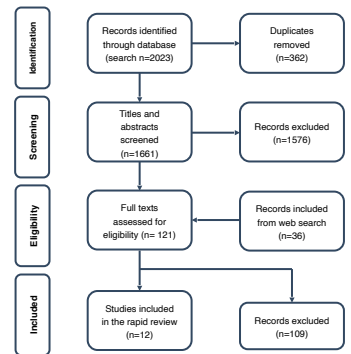

Figure 1: Selection and screening procedure

Results

We identified a preliminary list of competency statements within the 12 articles and studies reviewed and include examples below.

Public health practitioners require new competencies for digital transformation that cut across and extend existing public health competency frameworks in Canada

Leadership
Show entrepreneurial orientation through proactiveness, innovation, and risk-taking to advance public health, address newly emerging public health issues.

Data, data systems management & governance
- Apply policies and security protocols to protect confidential information in electronic files and computer systems while maximizing the benefits to public health.
- Develop public health information systems that are interoperable with other relevant information systems.

Assessment and analysis
Use, protect and interpret complex, linked large data sets from multiple sources from administrative, clinical, biologic, environmental, population to social/societal levels, within and outside the health systems.

Diversity and inclusiveness
Develop team approaches that bring together diverse disciplines and organizations to develop new and creative ways of designing and implementing services and addressing public health concerns.

Communication
Define target audience, develop correct messaging to reach people where they are, considering the people, places, and media they interact with daily and the information sources and formats they trust.

Policy and program planning, implementation and evaluation
Design, implement and evaluate population-based projects, programs or interventions that use social media as a communication platform and a tool for public health education and promotion.

Partnership, collaboration & advocacy
- Assess stakeholder data, information, and knowledge needs.
- Use new media to conduct advocacy e.g., social media.
- Manage IT operations related to project or program and those managed by external organizations.

Public Health Sciences
Develop and ethically apply research methods including data science, statistical genetics and omics technologies (i.e., exposomes), computational biology, epidemic and infectious disease modelling to public health problems.

Training approaches to facilitate digital competencies
- Combined MPH-Public health informatics degree programs
- Public health data science degree concentrations and professional certifications
- Integration of introductory public health informatics, computer science, and media communications courses into existing public health degrees
- Hands-on community-based practice in multi/interdisciplinary contexts (e.g., practicums)

Professional disciplines facilitating training
- Public health and public health informatics
- Computer science
- Information science
- Biostatistics and mathematics
- Health communication
- Sociology
- Management Sciences

Conclusions & Next Steps

- Competency recommendations for digital technologies in public health are cross-cutting and require upgrades across all current competency categories, including considering new categories to account for our new digital context.
- The recommendations highlight the inter/transdisciplinary nature of public health practice given its digital transformation.
- Next steps: Understand how public health institutions and schools are meeting identified competency needs and what updates to public health training curricula have been made.

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