

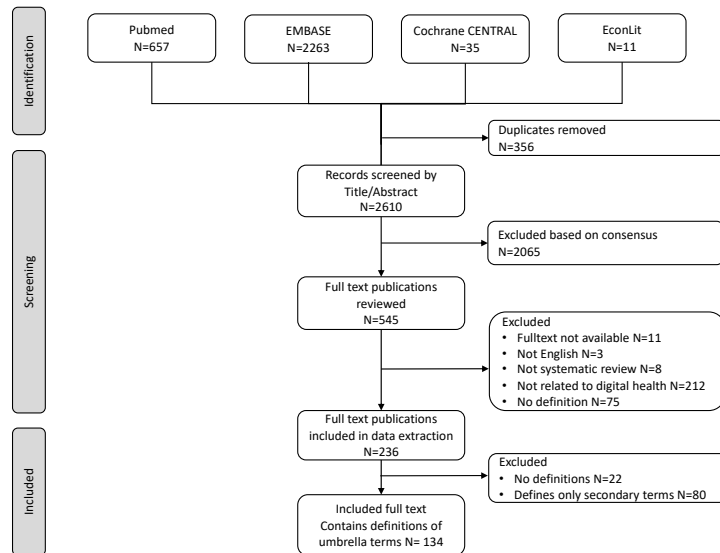
# POSC287: Improving Outcomes Research in Digital Health - Results of a Systematic Scoping Literature Review

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We conducted a literature search following the PRISMA guideline extension for scoping reviews<sup>1</sup> between January 2015 and May 2020 for systematic reviews including MeSH terms for digital health and synonyms of “definition”

**Figure 1: PRISMA diagram**

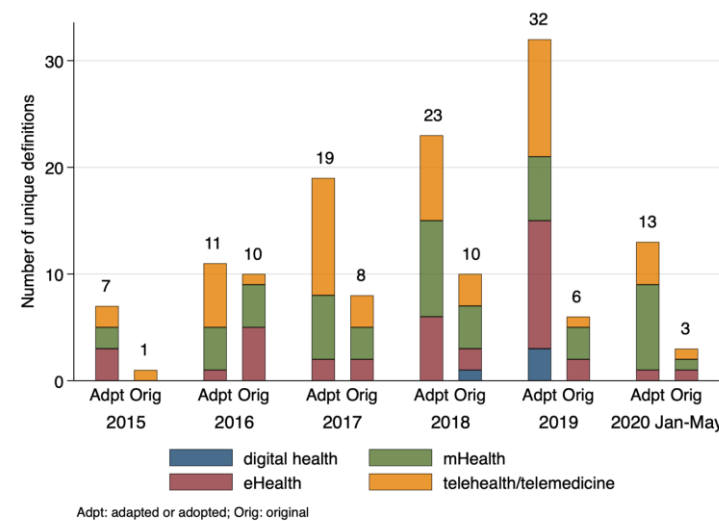


Of the papers retained containing umbrella terms for digital health

- Most frequent clinical areas concerned pregnancy and childbirth 10.4% (14/134), the circulatory system 8.2% (11/134), and mental and behavioural disorders 8.2% (11/134)
- Funding was not disclosed in 32.1% (43/134) of the papers, the most frequent funding source was the government 23.10%, (31/134) and only 2.2% (3/134) of papers were funded by the industry.
- Authors' geographic affiliation was mainly in Europe 38.1% (51/134), North America 32.8% (44/134), or Australasia 20.1% (27/134).
- Geographic area of interest was not specified in 77.6% (104 /134) papers. Low and middle-income countries were mentioned in 6.0% (8/134) of papers and Europe was mentioned in 4.5% (6/134) papers.
- The scientific area was medicine/health for most papers (88.8%, 119/134), while health economics publications were scarce (3.7%, 5/134).

Out of these 170 definitions of umbrella terms 142 were unique definitions. Definitions increased each year between 2015-2019 for all four umbrella terms (see Figure 2).

**Figure 2: Digital Health definitions by year and type**



There is a large degree of overlap in even the most common definitions for the umbrella terms. The WHO definitions are the most adopted and adapted references for mHealth and telemedicine/telehealth and frequently occurs as a definition for eHealth. The interchangeable use of telemedicine and telehealth can be directly related to the WHO 1998 definition<sup>2</sup>. We recommend that these established definitions be used in future outcomes research to define a question relating to digital health interventions since they are the most comprehensive and the use of a well-established definition would be preferable to standardize the field rather than trying to adapt or create new definitions which would add further confusion.

<sup>1</sup>Tricco AC et al, Ann Intern Medicine 2018;169(7):467-473

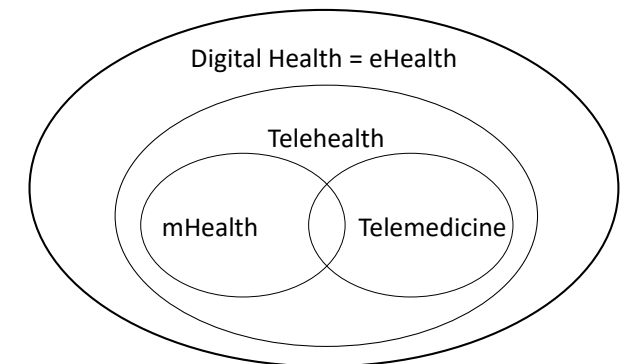
<sup>2</sup>WHO Report of the EHO Group Consultation on Health Telematics 1998

<sup>3</sup>FDA <https://www.fda.gov/medical-devices/digital-health-center-excellence/what-digital-health>

<sup>4</sup>Otto et al, 11<sup>th</sup> Joint Conference on Biomedical Engineering Systems and Technologies 2018

To aid future research we propose that digital health and eHealth should be considered as the same umbrella term. Telehealth can be considered a component that requires communication, and which contains mHealth and telemedicine which overlap when used to provide healthcare (see Figure 3). This would be in line with other taxonomies<sup>3,4</sup> suggesting that eHealth is the broadest concept and telehealth, mHealth and telemedicine are subterms focused on the use of communications technology to deliver healthcare.

**Figure 3: Digital Health taxonomy**



We also recommend that more specific information should be provided in the MeSH terms. A format that includes terms to define the healthcare setting, the specifics of the intervention and technology used, the patient population studied, the indication/clinical condition and particularly the outcomes under consideration as well as the comparison used would enhance future research efforts.

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