

## DIGITAL SOLUTIONS TO MITIGATE HEALTH INEQUALITIES – PRELIMINARY RESULTS OF A SYSTEMATIC LITERATURE REVIEW

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### ABSTRACT

Health inequalities refer to *differences, variations, and disparities in the health achievements of individuals and groups* [1]. These disparities are influenced by various social, economic, and environmental determinants, and manifest as differences in health status, life expectancy, and access to healthcare services. Addressing health inequalities is a global problem. In the European Union (EU), health inequalities cost approximately one trillion euro (9.4% of EU GDP) per year [2].

Public health in Sweden, one of the key EU nations, is highly ranked. However, health disparities and inequities in social determinants persist [3]. Swedish Parliament introduced a new national public health policy in 2018 to eliminate avoidable health inequalities. To implement the policy, the Public Health Agency of Sweden (Folkhälsomyndigheten) proposed a framework. The framework requires coordinated efforts at all levels, regional and national, involving researchers and practitioners in the field. To support realization of the framework, researchers at Linnaeus University, with expertise in social, health, computing and information sciences, formed a transdisciplinary team. The team aims to investigate use of digital solutions to address the problem of health inequalities. They tasked the first two authors of this abstract, under the supervision of the third author, to do a Systematic Literature Review (SLR).

The SLR aims to identify *what has been already reported and should be considered for the design and development of the digital solution(s)*. More specifically, the SLR targets following three research questions: *RQ1) What are the various factors, barriers, or other such elements that lead to health inequalities? RQ2) What digital solutions have been reported in the literature to mitigate health inequalities? RQ3) What are the trends in last 5 year for the use of digital solutions to mitigate health inequalities?* For all the three questions, we limited the scope of our search to countries of EU, EEA, United Kingdom, and Switzerland. These countries were selected based on their proximity to Sweden and other EU nations.

The SLR was conducted in accordance with PRISMA [4] and guidelines given by Kitchenham et al. [5]. We defined a review protocol document, available online<sup>1</sup>, to

<sup>1</sup> <https://lnu.box.com/s/5ktlfepvd6zycarogv3tuqnd8tcq20tp>

systematically guide and perform the review process. The protocol document specifies the goals, research questions (RQs), and strategies for performing the search, extracting and analyzing data, and report findings of the SLR. The goals and RQs are already specified above. The search strategy is mainly based on automatic search combined with manual search and snowballing. The automatic search was performed using PubMed<sup>2</sup> and Scopus<sup>3</sup> search tools with inclusion of studies written in English between 2020 and 2024. For this, we defined two search strings (SS), SS1 for the RQ1 and SS2 for the RQ2 and RQ3; both search strings are documented in the review protocol. Both search strings were tested for their accuracy and precision using quasi-gold standard method [6]. Execution of the search strings on PubMed and Scopus jointly resulted in 700 studies for SS1 and 756 studies for SS2.

We conducted a manual review of automatically searched studies using inclusion and exclusion criteria to eliminate irrelevant ones. The filtering process was done in two steps: first by reading titles and abstracts, and then by reading the full articles. After the first step, we identified 129 studies for RQ1, and 83 studies for RQ2 and RQ3. Following the second step, these numbers were further reduced to 32 for RQ1, and 17 for RQ2 and RQ3. In total, we selected 49 primary studies for analysis. We plan to use mixed analysis methods, primarily qualitative content analysis, to analyze the data from these primary studies and answer the research questions.

The analysis is ongoing, with preliminary results available. For RQ1, initial findings suggest that health inequalities are driven by factors such as unequal social, economic, and environmental conditions (social determinants of health), age, gender, ethnicity, migration, geographical locations, and systems and forces shaping life conditions, including political systems, economic policies, development agendas, and social norms. For RQ2, the main digital solutions identified to address health inequalities include eHealth, mHealth, Telehealth, Telemedicine, Artificial Intelligence, Big Data, and Digital Health Literacy programs. The analysis for RQ3 is not yet complete, but it is expected that mobile phone applications and other telecommunication-based digital solutions, along with Big Data-based AI and machine learning solutions, will be more prevalent and widely reported.

Designing digital tools and solutions to enhance health equality require to carefully consider challenges, for instance digital divide and digital health literacy. Our conjecture is that complete results of the review, which we plan to publish as future work, will be helpful to design new or extend existing digital solutions that are easy to access, understand, and use by all, including elderly and people with special needs.

**Keywords:** health, health inequalities, digital, digital solutions, digital transformation, socioeconomic factors, digital divide, systematic review.

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<sup>2</sup> <https://pubmed.ncbi.nlm.nih.gov/>

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