# Development of an eHealth Measures Compendium

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ONSISTENT and well-validated metrics of design, efficiency, and improved communication are necessary to determine the true benefit of any eHealth intervention without which healthcare organizations cannot 1) calculate return on investment of eHealth technology; 2) effectively address barriers to adoption that stem from these metrics (i.e. usability, accessibility of a technology); or 3) accurately estimate the likelihood of adoption. The goal of this project is to create a compendium of potential metrics that could be used in any study using eHealth interventions and create a standardized array of recommended metrics that will support both eHealth operations and research.

*Methods*: Working with an experienced health sciences librarian, an extensive list of search terms were developed addressing platforms (e.g., cell phone, patient portal), measurement (e.g., performance measurement, survey development) and functions (e.g., health information seeking). To date, major healthcare literature databases have been searched including Scopus, Pubmed, Cumulative Index of Nursing and Allied Health Literaterue (CINAHL), Health and Psychosocial Instruments (HAPI), and PsychInfo. To build this compendium effectively, the literature search will extend beyond a review of the medical literature and include research from the IEEE (Institute of Electrical and Electronics Engineers) and ACM (Association for Computing Machinery) digital libraries. Reliability estimates will be explored using the range of current statistics available (e.g. internal consistency, test-retest reliability, alternate forms reliability) as will validity estimates (content validity, construct validity, predictive validity, discriminant validity). Each metric will be described using a uniform format. A brief overview of the instrument's development, scoring procedures, psychometric properties, key references on the development and/or use of the instrument, and the actual scale (if available) will be included. The final compendium will be searchable by key words (using MeSH terms) so each metric will be cross-indexed by the topic/construct covered, the types of technology the metric addresses, and populations where the metric has been used. The database will also include references to articles or abstracts on use of the metric. Finally, at the conclusion of the search and review, we will upload our information to the Grid-Enabled Measures (GEM) database, sponsored by the National Cancer Institute.

*Results*: The study is in progress. We have developed and tested the review instrument using the uniform requirements addressed above. To date, 15 instruments known to the investigators prior to the search have been reviewed. The search of the healthcare literature resulted in 33,217 citations; approximately 70% have undergone a title/abstract review. Of those, less than 1% describe an instrument and less than 4% describe use of an instrument that potentially could be included in the compendium.

*Discussion*: Evaluation of eHealth is unique from evaluation of other interventions in three important ways that warrant development of a unique compendium: 1) it must include evaluation of the technology platforms and functions in terms of usability, functionality, and availability of the technology to target users; 2) eHealth applications are promoted to improve efficiency and accessibility, but there are no uniform widely agreed upon metrics; and 3) eHealth interventions aim to improve communication in one form or another, thus metrics are needed that quantify specifically the degree to which communication is improved.

*Conclusion*: The results of this project will provide critical insights regarding existing eHealth measures and identify gaps where new metrics are needed. The compendium can also inform future studies so that the results from multiple studies can be compared and synthesized because they used the same handful of metrics. A white paper will be developed to provide a critical synthesis and analysis of the current state of evaluation of eHealth in light of the strengths and weaknesses for each of the domains covered.

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