Data Analytics, Digital Health, & User Experience (UX)

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DataAware Boot Camp | July 15, 2019
Introduction

• About me

• About you
  
  Name
  
  School/School district
  
  Data skills/experience
  
  Expectation on the summer camp
Outline

• Data Analytics & Visualization

• Digital Health

• User Experience (UX)
Data Analytics & Visualization

Bibliometric Network Analysis
IMV Analyses and Data Types

Analyses
- Individual author publication metrics
- Author/institution/country collaboration analysis
- Citation impact analysis of a group
- Topic analysis for a group using author or index keywords or title/abstract terms
- Bipartite (multi-node) networks: collaboration/topics over time

Data Types
- Publication citation data
- Grant citation data
- Patent citation data
HSL IMV Team

• Staff
  Adam Dodd
  Barrie Hayes
  Fei Yu

• Graduate Students
  Amanda Haddock
  Zhaopeng Xing
Individual Researcher
NC TraCS

Author Collaboration Network

3,000 plus unique authors; 146 authors contributed at least 5 publications; 8 UNC units; Node = author; Node size = # of publications; Colors = affiliation/discipline
NC TraCS
Research Topic Map
Health IT is a double edged sword!

- Health IT is developed to improve healthcare quality and patient safety (IOM, 2011; Chaudhry et al., 2006; Radley et al., 2012).

- Health IT may cause patient safety concerns and other unintended consequences due to **usability issues** and technology-related constraints (Ash, Berg, & Coiera, 2004; Cheung et al., 2014; Dereck et al., 2014).
A Search in PubMed – 3006 results

(information technolog*[tiab] or health IT*[tiab] or health technolog*[tiab] or digital health device*[tiab] or mobile device*[tiab] or mobile application*[tiab] or mobile health*[tiab] or electronic health record*[tiab] or electronic medical record*[tiab] or electronic patient record*[tiab] or computerized medical record*[tiab] or medical order entry*[tiab] or physician order entry*[tiab] or clinical decision support*[tiab] or clinical information system*[tiab] or personal health record*[tiab])

AND

(patient safety*[tiab] or clinical error*[tiab] or omission error*[tiab] or medical error*[tiab] or medical mistake*[tiab] or diagnostic error*[tiab] or wrong*procedure error*[tiab] or omission medical error*[tiab] or wrong-site surger*[tiab] or surgical error*[tiab] or critical medical incident*[tiab] or medical critical incident*[tiab] or wrong*patient surger*[tiab] or medical errors[mesh] or patient harm*[tiab] or unintended consequences*[tiab])
Bibliometric Analysis - year
Bibliometric Analysis – Authors

Number of Documents

- Bates, DW
- Sittig, DF
- Singh, H
- Kaushal, R
- Sheikh, A
- Gandhi, TK
- Wright, A
- Seger, DI
- Kuperman, GJ
## Bibliometric Analysis – Top Cited

<table>
<thead>
<tr>
<th>Total Citation Counts</th>
<th>Relative Citation Ratio</th>
<th>Authors</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1184</td>
<td>44.14</td>
<td>Bates et al. (1998)</td>
<td>Effect of computerized physician order entry and a team intervention on prevention of serious medication errors.</td>
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<tr>
<td>1038</td>
<td>41.62</td>
<td>Koppel et al. (2005)</td>
<td>Role of computerized physician order entry systems in facilitating medication errors.</td>
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<tr>
<td>632</td>
<td>23.84</td>
<td>Leape, &amp; Berwick (2005)</td>
<td>Five years after To Err Is Human: what have we learned?</td>
</tr>
<tr>
<td>587</td>
<td>22.76</td>
<td>Han et al. (2005)</td>
<td>Unexpected increased mortality after implementation of a commercially sold computerized physician order entry system.</td>
</tr>
</tbody>
</table>
Bibliometric Analysis – keywords
Bibliometric Analysis – keywords
Data Analytics & Visualization

Text Mining for Second-use of Health Data
Two projects

Yu, F., Mani, N., & Walker, J. (2019, May). Applying text mining analytics to virtual reference services: A case study on the email question & answer (Q&A) service at an academic health sciences library. Paper abstract presented at the Medical Librarian Association (MLA) Annual Conference, Chicago, IL.

Digital Health & UX
Fitbit Validation & Reliability Testing: Phase I
Fitbit Validation & Reliability Testing: Phase II