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A Mixed-Methods Assessment of the Implementation of Electronic Health Records in Local Health Departments

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JIANN-PING HSU COLLEGE OF PUBLIC HEALTH

2016 GSU RESEARCH SYMPOSIUM | SATURDAY, APRIL 16, 2016 | 4:00 PM
OVERVIEW

- Statement of Problem
- Purpose
- Research Questions
- Introduction and Background
- Terminology
- Methodology
- Results
- Discussion and Implications
- Strengths and Limitations
- Conclusions
STATEMENT OF PROBLEM

- Local Health Departments (LHDs) have the responsibility to provide services to the communities they serve
- Lack of health informatics affects organizational operations and the provision of services
- 2013 National Profile of LHDs – 22% of LHDs implemented EHRs
State adoption rates have increased from 2008 to 2014.

Figure 2: State percent of non-federal acute care hospitals with adoption of at least a Basic EHR system compared with prior years.

NOTES: Basic EHR adoption requires the EHR system to have at least a basic set of EHR functions, including clinician notes, as defined in Table A1. Estimates for states shaded gray did not meet the standards for reliability (NR). See the Table A2 for a complete list of 2008 and 2011 hospital adoption by state.

SOURCE: ONC/AHA, AHA Annual Survey Information Technology Supplement
PURPOSE

- To provide an updated, comprehensive view of the level of EHR implementation in LHDs
- To examine the benefits, barriers, and strategies
- To assess the future plans of implementation
RESEARCH QUESTIONS

Q1: What is the current level of implementation of EHRs in LHDs?
   - A: What are the benefits of implementation?
   - B: What are the barriers of implementation?
   - C: What strategies have worked for implementation?
RESEARCH QUESTIONS (2)

- Q2: What LHD characteristics are associated with EHR implementation?

- Q3: What are the future plans of LHDs to implement EHRs?
INTRODUCTION AND BACKGROUND

ELECTRONIC MEDICAL RECORD SYSTEM

ELECTRONIC HEALTH RECORD SYSTEM
TERMINOLOGY

- **Health informatics**: scientific discipline concerned with cognitive, information-processing, and communication tasks of health care practice, education, and research *(AHIMA, 2014)*

- **Electronic Health Record**: digital version of paper chart in real-time making information available instantly and securely to authorized users *(HealthIT.gov, 2013)*
METHODOLOGY
RESEARCH DESIGN

- Mixed-methods approach
  - Qualitative
    - Exploratory interviews
      - Level of EHR implementation (RQ1)
      - Benefits of EHR implementation (RQ1A)
      - Barriers to EHR implementation (RQ1B)
      - Strategies for successful implementation (RQ1C)
RESEARCH DESIGN (2)

○ Quantitative
  ○ Cross-sectional survey
    ○ Level of implementation of EHR system (RQ1)
    ○ LHD characteristics (RQ2)
    ○ Future plans of EHR Implementation (RQ3)
TRIANGULATION

Qualitative Data
- Data Collection
- Data Analysis using thematic coding
- Results

Quantitative Data
- Data Collection
- Data Analysis using descriptive statistics
- Results

Mixing
Combining status, benefits, barriers, and strategies from qualitative data with status and future plans from quantitative data

Interpretation
Summarize, interpret, and discuss results for a comprehensive view of implementation of EHRs in LHDs

[Triangulation Design for Mixed Methods Research (adapted from Creswell & Plano, 2007)]
Qualitative Data

- Funded by de Beaumont Foundation
- Data collected by JPHCOPH Team
  - 49 key-informant interviews of LHD leaders across the U.S.
  - Based on purposive sampling to obtain appropriate levels of informatics capacity and population size variation
  - Multiple rounds of coding, inter-coder reliability using NVivo
Quantitative Data

- NACCHOs’ 2015 Informatics Needs Assessment
- JPHCOPH data collection team
  - Stratified random sampling design based on 7-strata population

Table 1: Responses and Response Rates by population category

<table>
<thead>
<tr>
<th>Population Category</th>
<th>Number of LHDs in Sample</th>
<th>Number of Respondents</th>
<th>Response Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;25,000</td>
<td>209</td>
<td>87</td>
<td>42%</td>
</tr>
<tr>
<td>25,000 - 49,999</td>
<td>117</td>
<td>65</td>
<td>56%</td>
</tr>
<tr>
<td>50,000-99,999</td>
<td>100</td>
<td>43</td>
<td>43%</td>
</tr>
<tr>
<td>100,000-249,999</td>
<td>82</td>
<td>45</td>
<td>55%</td>
</tr>
<tr>
<td>250,000-499,999</td>
<td>56</td>
<td>34</td>
<td>61%</td>
</tr>
<tr>
<td>500,000-999,999</td>
<td>47</td>
<td>25</td>
<td>53%</td>
</tr>
<tr>
<td>&gt;=1000,000</td>
<td>39</td>
<td>25</td>
<td>64%</td>
</tr>
<tr>
<td>All LHDs</td>
<td>650</td>
<td>324</td>
<td>50%</td>
</tr>
</tbody>
</table>
Quantitative Data (2)

- 324 LHD respondents
  - 50% response rate – acceptable by CDC for this type of study (past 43% and 32%)

- Larger LHDs were oversampled and over-represented, statistical weights were developed
RESULTS
Research Question 1

○ What is the current level of implementation of EHRs in LHDs?
  ○ Qualitative
    ○ Majority of respondents mentioned no activity
    ○ Followed by have implemented
  ○ Quantitative
    ○ 58% had non-EHR systems for storage of health data
    ○ 42% had EHR systems (20% increase from 2013 Profile)
RQ1: Level of EHR Implementation

- Qualitative themes
  - Have implemented (16)
  - Almost implemented (3)
  - Planning to implement/investigating (6)
  - No activity (24)
Have Implemented

- We went live on September 2011. We had the **clinical and the practice management** component. At that time had access to everything, so you have the potential, the **patient portal**, you had a more robust **reporting** and then what's just inside the system so you could go in and do **accounting reports**, you could do more specific **disease-related items**... We spent a lot of time doing **preliminary work**. We spent, 8 months investigating an **electronic health record**, we looked all the ONC and requirements and **meaningful use** and made sure they were **certified EHR**. We were small, so we looked at class scores for the small providers, 1 to 2 or less than 5 provider site, and the clinical kind of went out on—when we just did an **overall assessment**, we also knew that we had to have a host system because the state or the county has one IT person for all departments. We knew that we can **manage the security** and all the items associated with having servers.
No Activity

- I can't justify the cause when we don't provide that much primary care. We don't have primary healthcare services, we do immunizations and the state has a web-based vaccine registry that we plug in all the immunizations that we give into it. At the state level they are trying to work to do an interface with the EHRs.
RQ1: Level of EHR Implementation

Primary Storage System Used by LHDs

- Custom Built EHR System: 7%
- Vendor Built EHR System: 33%
- Open-Source EHR System: 2%
- Other EHR: 14%
- Non-EHR System: 44%

n = 277
<table>
<thead>
<tr>
<th>Table 2: Major Themes of EHR Benefits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Elimination of paper</td>
</tr>
<tr>
<td>Flexibility</td>
</tr>
<tr>
<td>Infrastructure</td>
</tr>
<tr>
<td>Interface with the community</td>
</tr>
<tr>
<td>Reportable quality improvement</td>
</tr>
<tr>
<td>Systems communicate with state systems</td>
</tr>
<tr>
<td>Accurate records</td>
</tr>
<tr>
<td>Anonymity and security easy to maintain</td>
</tr>
<tr>
<td><strong>Care coordination</strong></td>
</tr>
<tr>
<td>Readmissions</td>
</tr>
<tr>
<td>Completeness of data</td>
</tr>
<tr>
<td>Consistency with medical school training</td>
</tr>
<tr>
<td>Data entry ease</td>
</tr>
<tr>
<td>Decision-making</td>
</tr>
<tr>
<td>Policy Development</td>
</tr>
<tr>
<td>Detect outbreaks</td>
</tr>
<tr>
<td>Efficiencies due to EHRs</td>
</tr>
<tr>
<td>Financial benefits</td>
</tr>
<tr>
<td>Grant writing support</td>
</tr>
</tbody>
</table>
Table 3: Major Themes of EHR Barriers

<table>
<thead>
<tr>
<th>Theme</th>
<th>Barriers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Benefits are unknown</td>
<td>Lack of collaboration between state and local agencies</td>
</tr>
<tr>
<td>Federal regulations</td>
<td>Lack of collaboration between hospitals and public health agencies</td>
</tr>
<tr>
<td><strong>Financial resources needed</strong></td>
<td>Lack of vendors</td>
</tr>
<tr>
<td>Low IT capacity</td>
<td>Lack of Vision</td>
</tr>
<tr>
<td>No clinical services</td>
<td>Leadership and vision</td>
</tr>
<tr>
<td>No control over decision</td>
<td>Limited trained Staff</td>
</tr>
<tr>
<td><strong>No staff or no trained staff</strong></td>
<td>Money</td>
</tr>
<tr>
<td>Priority is low</td>
<td>More requirements</td>
</tr>
<tr>
<td><strong>Resistance to or fear of change</strong></td>
<td>Small size makes estimates hard</td>
</tr>
<tr>
<td><strong>Training, lack of</strong></td>
<td>Staff capacity</td>
</tr>
<tr>
<td>Bad relationship with IT and turf battles</td>
<td>Time</td>
</tr>
<tr>
<td>Data are bad or unavailable</td>
<td>Cost</td>
</tr>
<tr>
<td>Dependent on state</td>
<td>Issues during implementation</td>
</tr>
<tr>
<td>HIPAA</td>
<td>Staff taking quality improvement personally</td>
</tr>
<tr>
<td>Infrastructure</td>
<td></td>
</tr>
</tbody>
</table>
Research Question 1C - Strategies

- Begging money
- Communication
- Control over system purchase
- Costs benefit analysis
- Quality improvement
- Relationships

- Specialized software
- Staff involvement in process
- Staff training
- Staff with expertise
- Technical assistance
Research Question 3 – Future Plans

Future Plans of EHR Implementation in LHDs

- Selected a system and in the process of implementing: 48%
- Selected a system but have not begun implementation: 37%
- In process of researching and/or selecting system: 4%
- No plans: 12%

n = 103
DISCUSSION & IMPLICATIONS

- 42% of EHR systems implemented
- Benefits of EHR System
- Barriers of EHR Implementation
- Strategies for Success
- Future of EHR Implementation
STRENGTHS

- Rich, qualitative research
- National representative sample of LHDs
- Sampling Design
- NACCHO’s history
- Triangulation
LIMITATIONS

- Time constraints
- Self-reported
- Knowledge of terminology used
- Triangulation
CONCLUSIONS

- Leadership optimism
- Strategies are simple approaches
- EHR will improve
  - Coordination of patient care
  - Surveillance and prevention of chronic disease
  - Reduction of health disparities
  - Development of targeted interventions
  - Provide evidence-based policy decisions
REFERENCES


REFERENCES (2)


Thank you