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

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

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# OVERVIEW

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

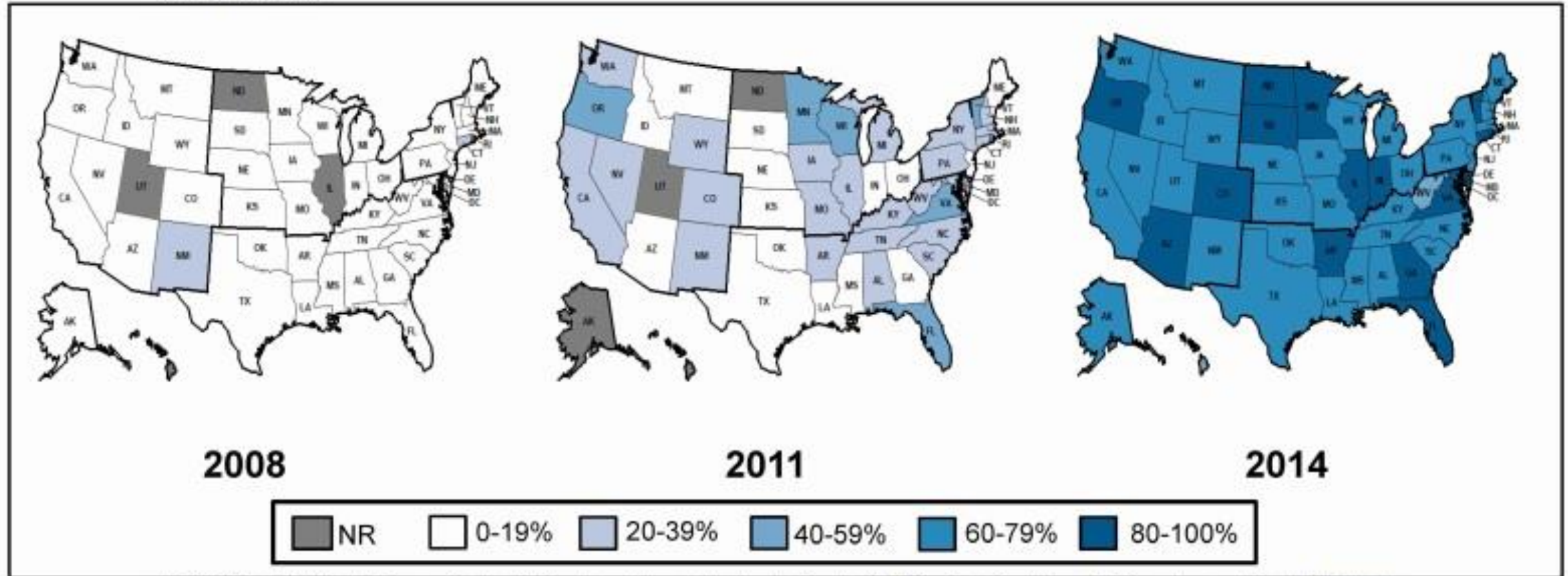
# STATEMENT OF PROBLEM

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- 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

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- 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

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- **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)

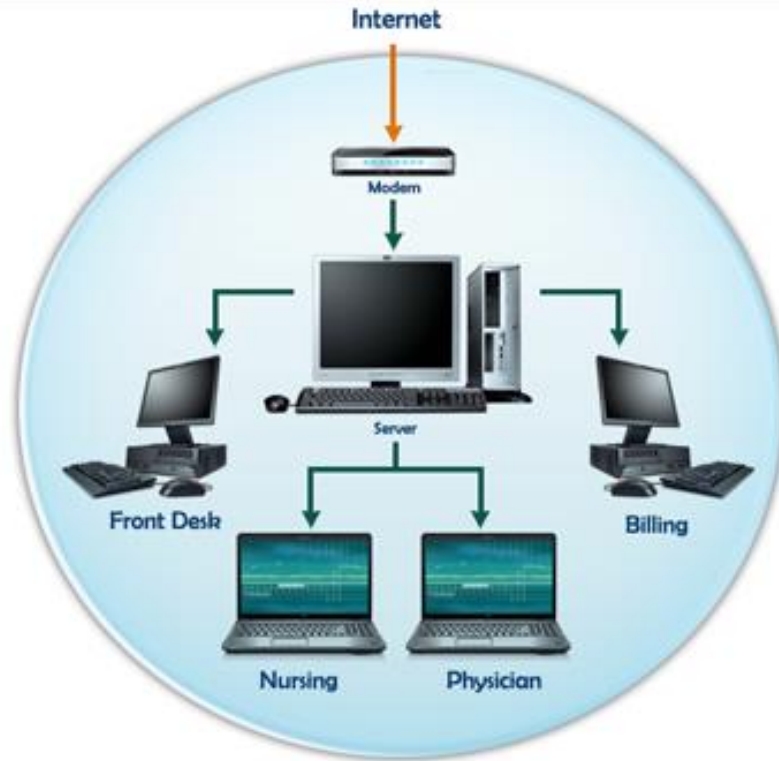
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- Q2: What LHD characteristics are associated with EHR implementation?
- **Q3: What are the future plans of LHDs to implement EHRs?**

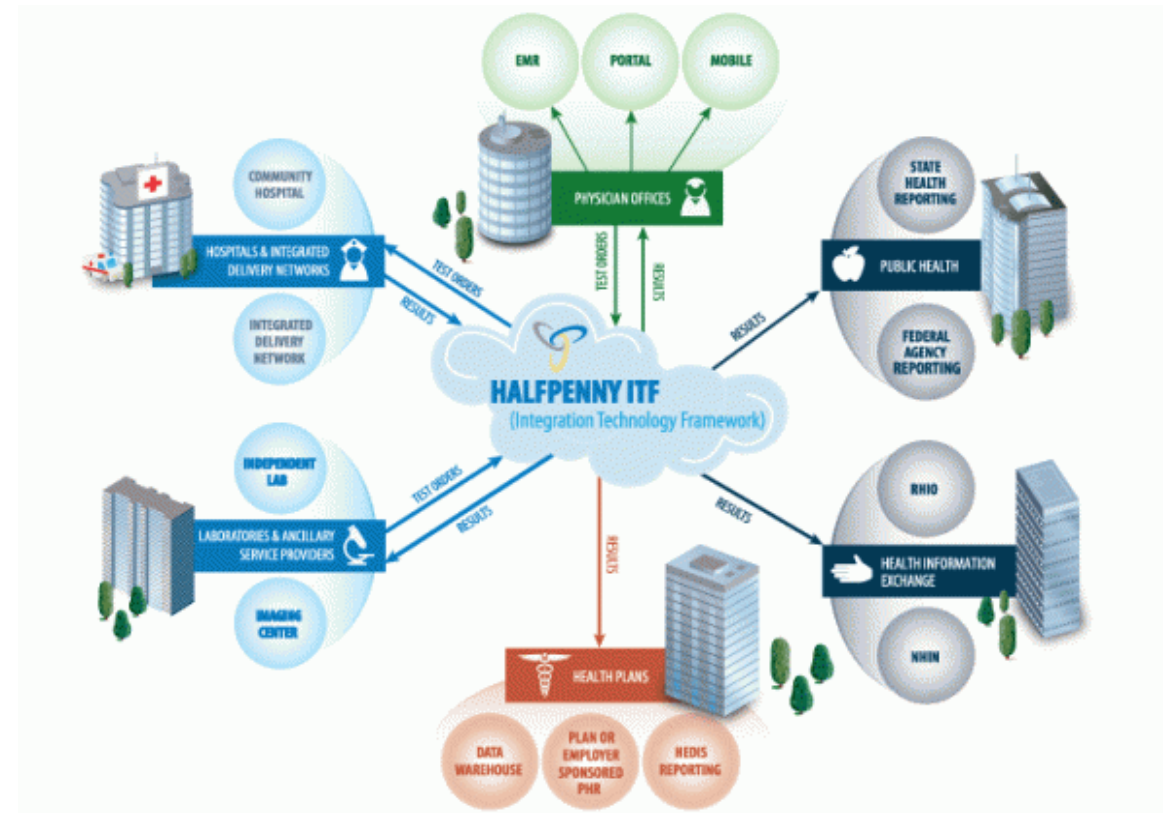


# INTRODUCTION AND BACKGROUND

## ELECTRONIC MEDICAL RECORD SYSTEM



## ELECTRONIC HEALTH RECORD SYSTEM



# TERMINOLOGY

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- **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

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# RESEARCH DESIGN

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- 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)

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- Quantitative

- Cross-sectional survey

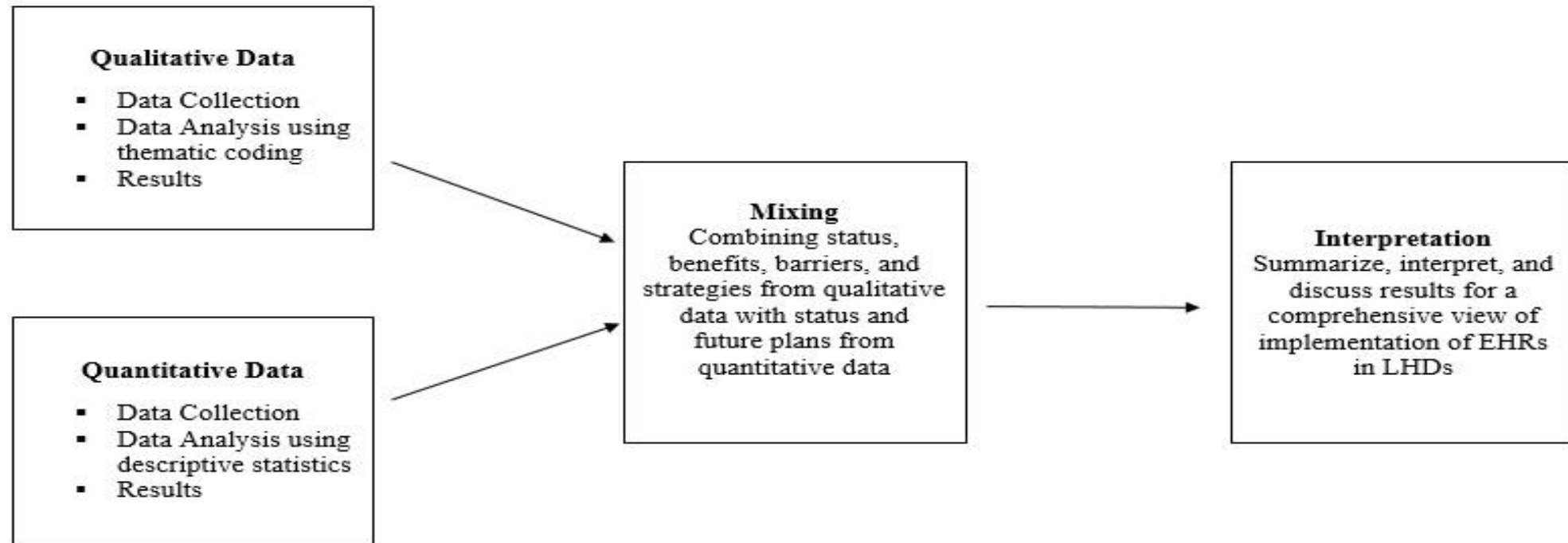
- Level of implementation of EHR system (RQ1)

- LHD characteristics (RQ2)

- Future plans of EHR Implementation (RQ3)

# TRIANGULATION

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

# Qualitative Data

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- 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

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- 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

Population Category	Number of LHDs in Sample	Number of Respondents	Response Rate
<25,000	209	87	42%
25,000 - 49,999	117	65	56%
50,000-99,999	100	43	43%
100,000-249,999	82	45	55%
250,000-499,999	56	34	61%
500,000-999,999	47	25	53%
>=1000,000	39	25	64%
All LHDs	650	324	50%



## Quantitative Data (2)

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- 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

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# Research Question 1

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- 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

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

# Have Implemented

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- *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.*

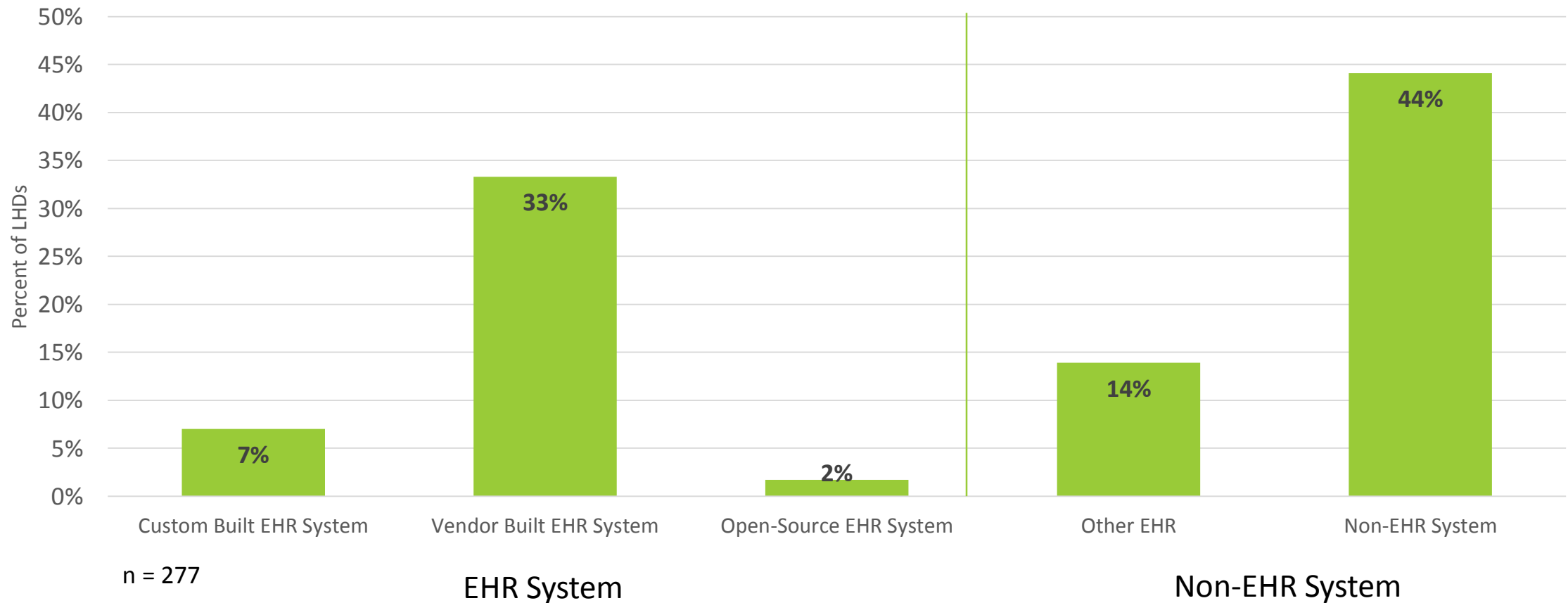
# No Activity

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- *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



**Table 2: Major Themes of EHR Benefits**

Elimination of paper	Immunization completion information
Flexibility	Information for leadership readily available
Infrastructure	Interoperability
Interface with the community	Inventories
Reportable quality improvement	Medical errors prevented
Systems communicate with state systems	Paper copy reduction
Accurate records	Patient can access their information
Anonymity and security easy to maintain	Planning
<b>Care coordination</b>	Quality improvement
Readmissions	Quantify service provision
Completeness of data	<b>Retrieve or manage information</b>
Consistency with medical school training	Billing tracking
Data entry ease	Patient information
Decision-making	Secure or protect against loss
Policy Development	Share information with partners
Detect outbreaks	Staff morale
Efficiencies due to EHRs	Timely information
Financial benefits	<b>Track outcomes of care</b>
Grant writing support	Transportability



**Table 3: Major Themes of EHR Barriers**

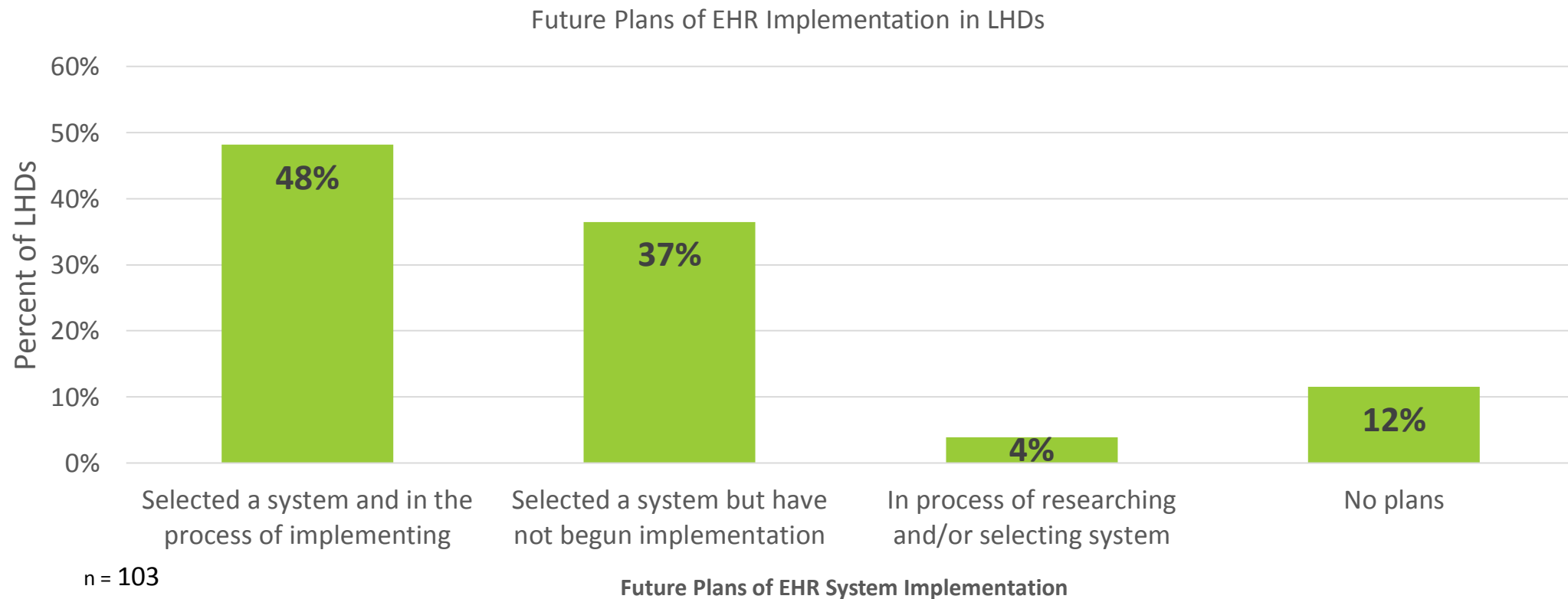
Benefits are unknown	Lack of collaboration between state and local agencies
Federal regulations	Lack of collaboration between hospitals and public health agencies
<b>Financial resources needed</b>	Lack of vendors
Low IT capacity	Lack of Vision
No clinical services	Leadership and vision
No control over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

# Research Question 1C - Strategies

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- 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



# DISCUSSION & IMPLICATIONS

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

# STRENGTHS

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

# LIMITATIONS

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

# CONCLUSIONS

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- 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

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