Assessing the County-Level Representativeness of an Electronic Health-Record Based Surveillance System in a Large Metropolitan Area

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Distributed Data Networks: A New Tool for Public Health

- Millions of individuals seek care in US hospitals and clinics each year
- Electronic health records (EHR) are widespread and routinely share information to improve patient health
- EHR data are increasingly being shared to care for population health
Distributed Data Networks: A New Tool for Public Health

- HIPAA protects the privacy and security of data collected in health systems.
- Distributed data networks (DDNs) enable health data to remain in place until they are required for a research or public health question.
Colorado Health Observation Regional Data Service (CHORDS)

Health Systems
- Children’s Hospital Colorado
- Denver Health
- Kaiser Permanente Colorado

Mental Health Centers
- Mental Health Center of Denver
- Jefferson Center for Mental Health

Safety Net Providers
- Clinica Family Health
- Colorado Alliance for Health Equity and Practice
  - Colorado Coalition for the Homeless
- High Plains Community Health Center
- Metro Community Providers Network
  - Salud Family Health Centers
  - Clinica Tepeyac
Question: Can CHORDS be Used for Surveillance?

Steps in the collection of EHR data through CHORDS:

1. A person seeks healthcare
2. A person is seen by a provider
3. A person chooses a particular healthcare organization
4. Particular organizations participate in CHORDS
5. Particular organizations in CHORDS choose to share data in a given query
Question: Can CHORDS be Used for Surveillance?

• Surveillance systems should be representative in order “to better characterize the epidemiologic characteristics of a health-related event in a defined population”
  – Compared to a larger population
  – Utilizing multiple data sources

*Updated Guidelines for Evaluating Public Health Surveillance Systems: Recommendations from the Guidelines Working Group. MMWR July 27, 2001 / 50(RR13); 1-35*
Assessing County-Level Representativeness of CHORDS

• **Goal:** To assess the county-level representativeness of CHORDS, restricted to:
  – Adults 18 years and older
  – Ambulatory visit during 2015

**Comparator Populations:**

• The general population in a county
  – *American Community Survey (5-year estimates)*
• The county population that sought any healthcare
  – *Colorado Health Access Survey*
• The county population receiving routine healthcare
  – *Colorado Behavioral Risk Factor Surveillance System*
Assessing County-Level Representativeness of CHORDS

• **Goal:** To assess the county-level representativeness of CHORDS, restricted to:
  – Adults 18 years and older
  – Ambulatory visit during 2015

• **Methods:**
  • County Comparisons:
    – Counts
    – Sex distribution
    – Age distribution
    – Race/ethnicity distribution
    – Poverty areas
  • Standard errors and z scores estimated according to US Census Bureau guidance
    – $p = 0.01$ and $p = 0.05$
CHORDS Coverage:
Adults >=18 years, Residing in Denver County

527,965 Adult Residents of Denver County (SE=90)
  *American Community Survey, 2012-2016*

482,740 Received Any Health Care (SE=28,942)
  *Colorado Health Access Survey, 2015*

333,144 Received Routine Care (SE=20,091)
  *Colorado BRFSS, 2015*

156,886 Adults* with 2015 Ambulatory Visit in CHORDS

*Prior to between-site deduplication*
CHORDS Representativeness:
Percent of Adults in Denver by Data Source, 2015

* Significant at p=0.05
** Significant at p=0.01
Cross-County Trends In EHR Representativeness

- CHORDS compared to general adult population (ACS):
  - Higher proportions of females in CHORDS
  - Higher proportions of adults 65 years and older
  - Higher proportions of Hispanic or Latino adults
  - Higher proportions of adults in poverty areas
- CHORDS compared to adults in care (CHAS & BRFSS):
  - Higher proportions of Hispanic or Latino adults
- Some variation in coverage and representativeness by county and population
Discussion

- Large number of patients in CHORDS EHR network
- DDN reflects patterns in healthcare utilization (e.g., women vs. men), as well as the composition of the CHORDS network (e.g., FQHCs)
- Large uncertainty in survey estimates at the local level limits validation efforts somewhat
- Population weighting can be applied to EHR data to make population estimates more representative
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To learn more, visit: www.chordsnetwork.org