

**CDC Data Challenge:
Extending Public Health
Surveillance Reporting
Through Digital Data
Collection of Behavior
Patterns and Existing
Conditions**

Group: Data 2 Policy

**Beth Ann Fiedler, PhD
Jacqueline Ortiz-Baerga, ABD**

Agenda

Team Introduction

Project Overview

- *Problem Statement

- *Purpose

- *Methods

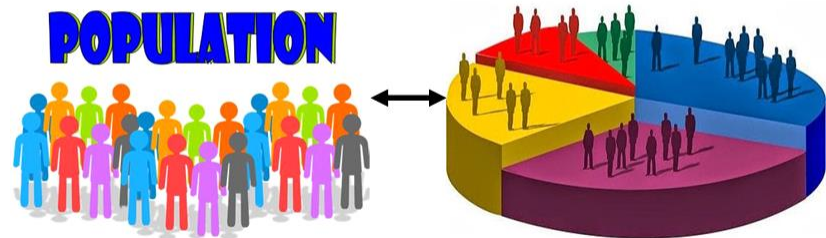
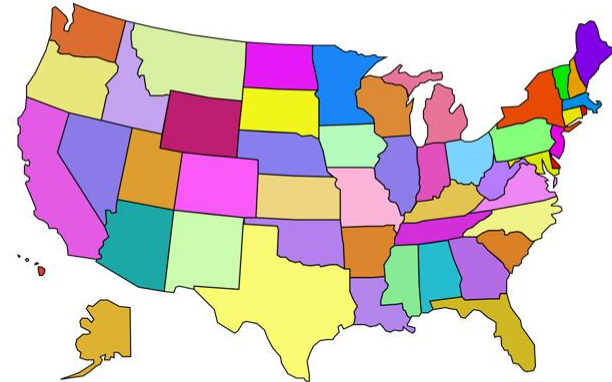
- *Key Resources

- *Enhanced Metrics

- *Optimizing Existing Data Infrastructure

- *Evidence-Based Decision-Making

Summary



Beth Ann Fiedler, PhD

Health Generalist/Research Analyst

- *Data collection
- *Project Management
- *Allied health professionals
- *Advanced statistical analysis
- *Regulation and healthcare quality
- *Factors influencing public health and policy



Data 2 Policy Team



Jacqueline Ortiz-Baerga, ABD

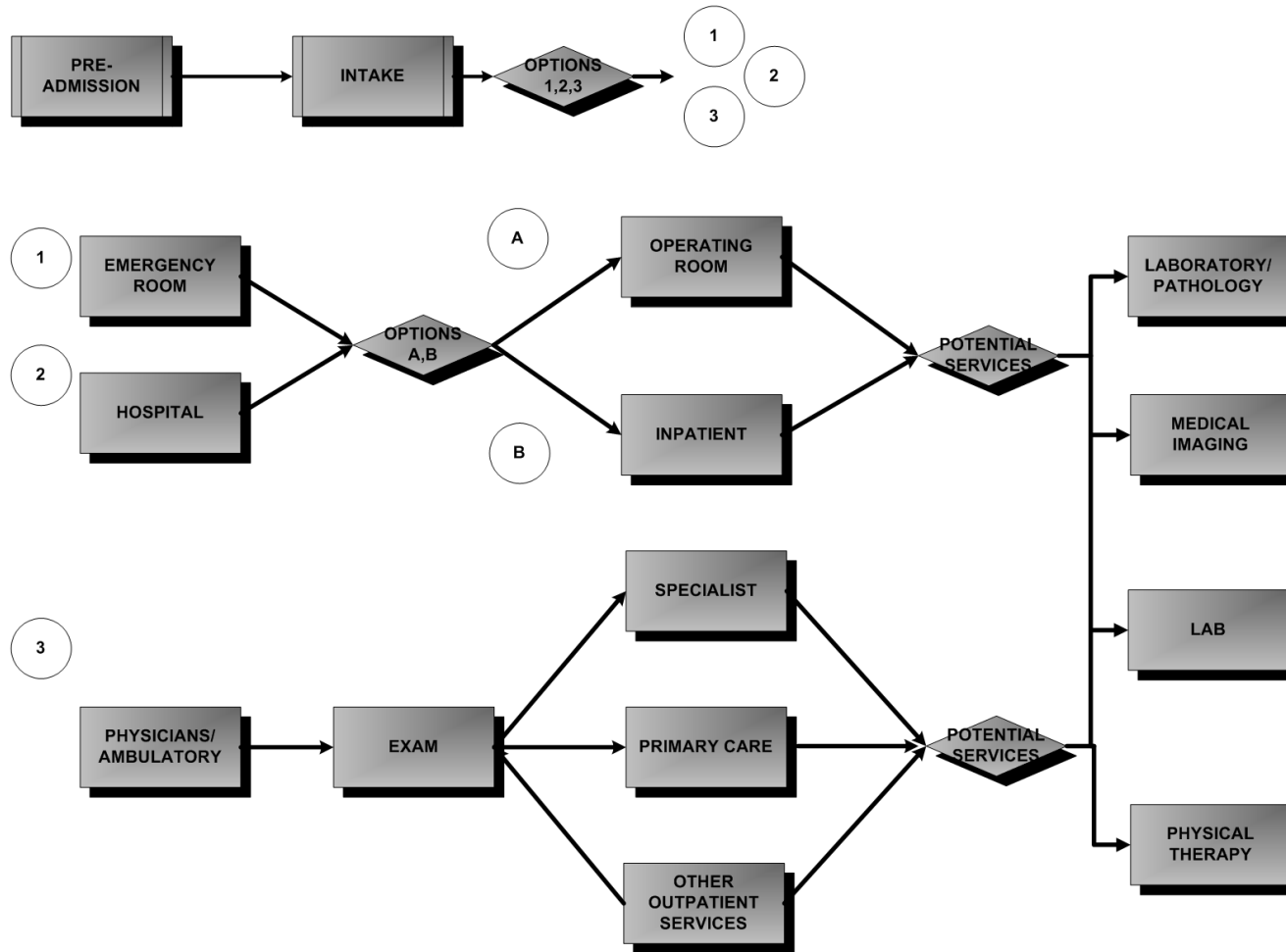
Population Health

- *Business management
- *Non-profit management
- *Strategic human relations
- *Human resources and diversity
- *Information systems technology
- *Development and retention of healthcare professionals

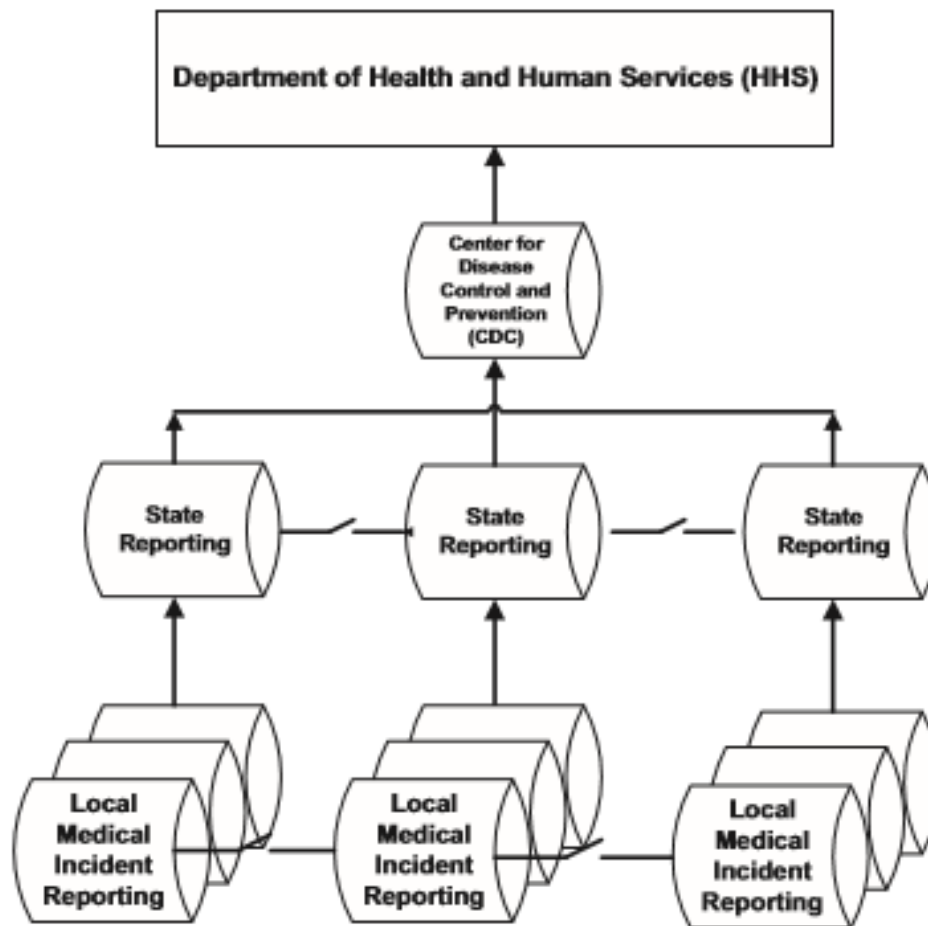
Problem Statement

- *Overcome antiquated data collection methods
 - *Incorporate digital technology sources
 - *Enhance inter-agency data sharing
- *Evidence-Based Analysis
 - *Introduce new metrics

DRIVING DATA COLLECTION THROUGH EXISTING DIGITALIZATION IN PATIENT CLINICAL SERVICES



Method
Exploit Existing Patient Digital Pre-Registration and Check-In Process for Survey Engagement

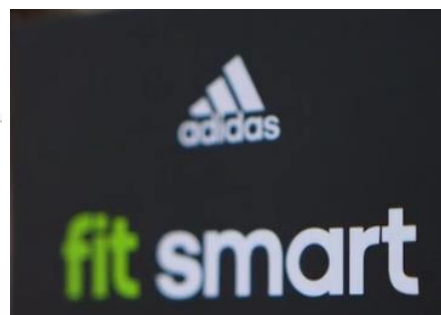


Method

Envelope Existing
WHO ICD
Diagnosis Codes
Currently Utilized
by the CDC to
Aggregate Data



FITOCRACY

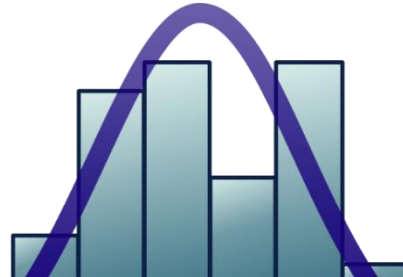


Method

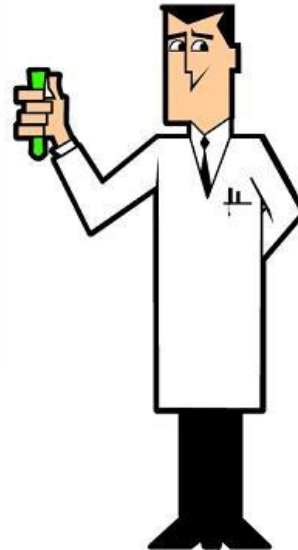
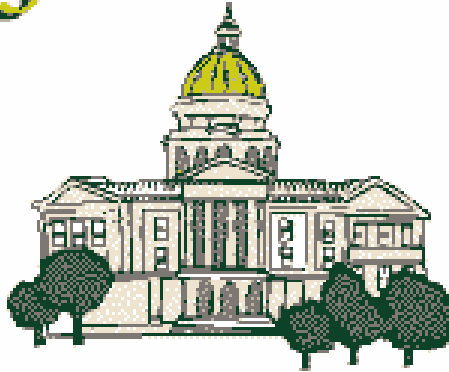
Collaborate with
Wearables+ and
Activity Trackers+
*Promote Ease of
Data Appended to
Survey Questions
*Increase Use of
Wearables
*Suggest Use of
Alternate Methods
of Data Capture
and Transmission

+Product icon is used for demonstration purposes and does not imply endorsement of presented material or product preference.

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Government

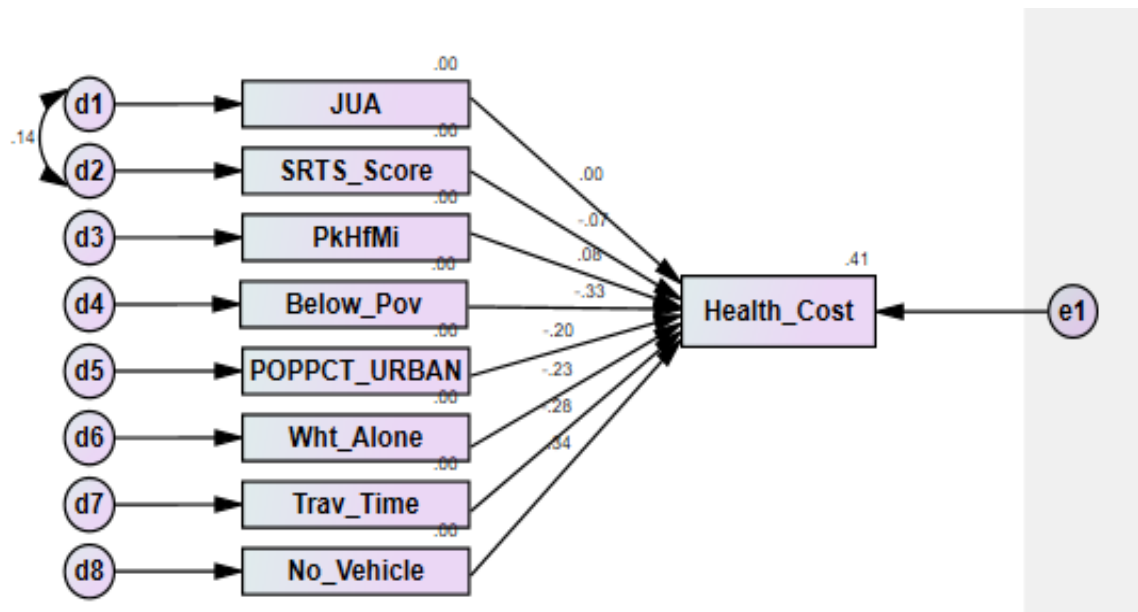


Key Resources

- *Academic
- *Business
- *Government
- *Medical
- *Science
- *Statistics

-Frequency Data Collected Independent
of Outcome Data (i.e., individual health status, cost efficiency,
equitable resource distribution, program effectiveness) has little,
if any, Predictive Value

-Collecting Data with different data types misrepresents
outcomes and also preempts analysis



Poor
Metrics

Resources See Append ix 1:
Behavioral Risk Factor Surveillance System (BRFSS)
CDC 500 Cities Project
Kaiser Family Foundation
Safe Routes to School National Partnership *State Report Card*
U.S. Census Bureau : American Community Survey 5-year estimates

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Dichotomous-Used to Maintain Historical Frequency Data, Collect Tangential Health Information (mental, social), and Promote Options to Engage

- **Predictor (mental):** Do you sometimes overeat (snacking between meals, eating more than serving size portions, eating more than your recommended daily calories?
- **Predictor (social):** Are you aware of opportunities to attend community development and planning meetings?
- **Outcome:** Do you suffer from a non-communicable disease(s)? Enter ICD Code/Describe
- **Outcome:** Do you suffer from communicable disease(s)? Enter ICD Code/Describe

Questions Designed to Enhance Analysis

Ordinal-Used for Advanced Statistical Analysis: 3-Point Likert Scale

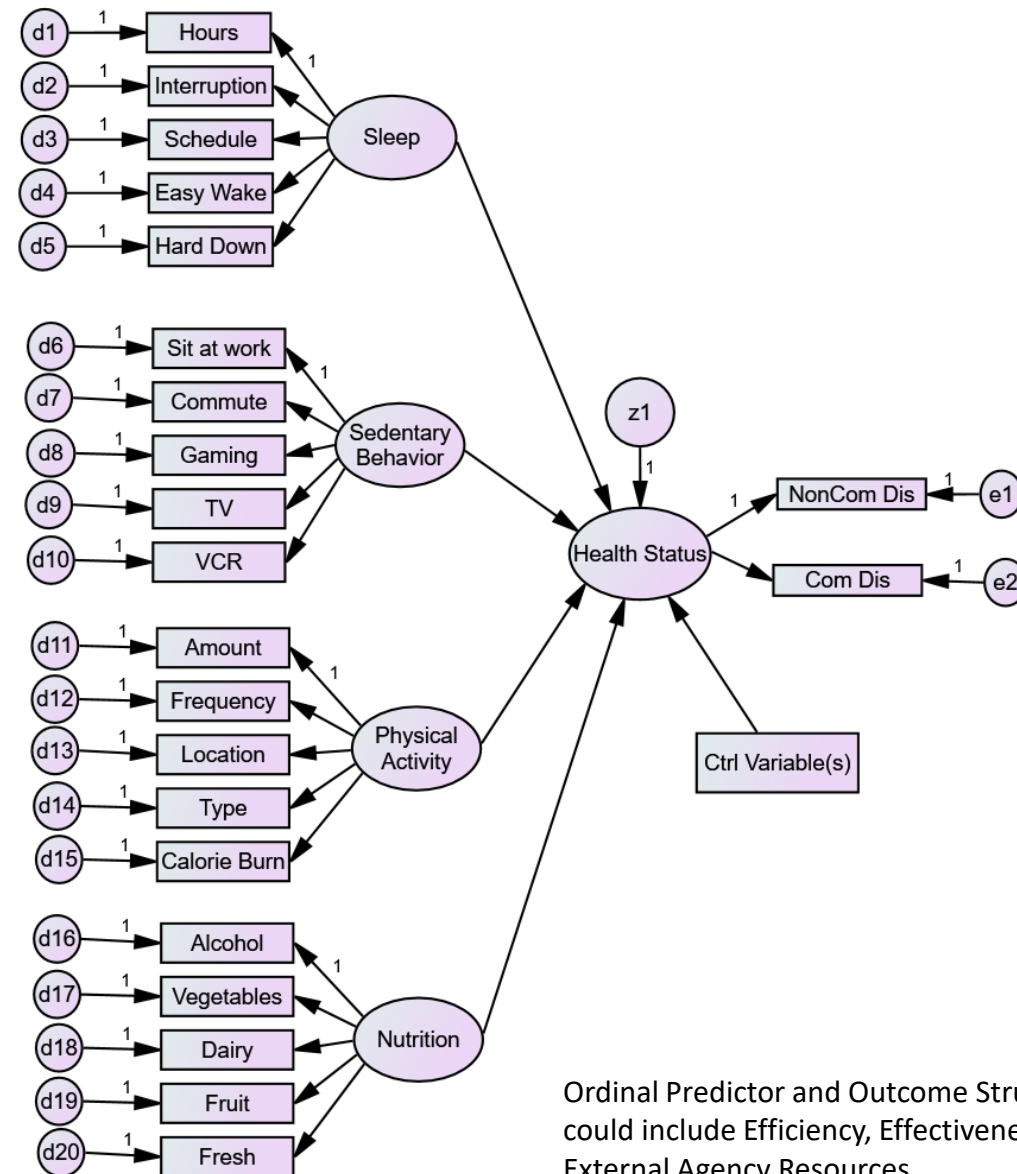
- **Predictor (mental):** Do you overeat at least once a week? twice a week? three or more times a week?
- **Predictor (social):** In the past year, have you attended at least one community development or planning meeting? at least two? three or more?
- **Outcome:** Are you diagnosed with than one non-communicable disease? At least two? Three or more?
- **Outcome:** Are you diagnosed with more than one communicable disease? At lease two? Three or more?

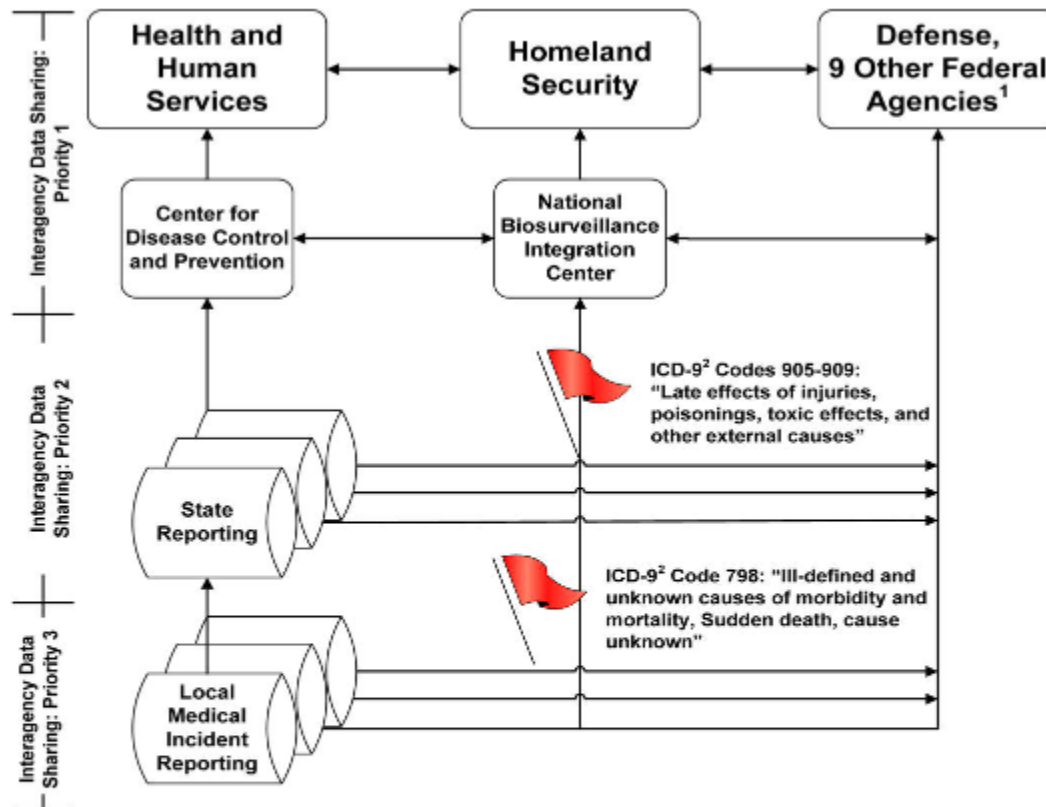
Enhanced Metrics

- *Advanced statistical analysis
- *Custom survey question development allowing for extended analysis
- *Transformable embedded measures (i.e., continuous, dichotomous, ordinal, and customizable ratios)
- *Evidence-based decision-making
- *Theory-based modeling

Ordinal Predictor and Outcome Structural Equation Modeling ; Outcomes could include Efficiency, Effectiveness and Equity Data from Survey or External Agency Resources

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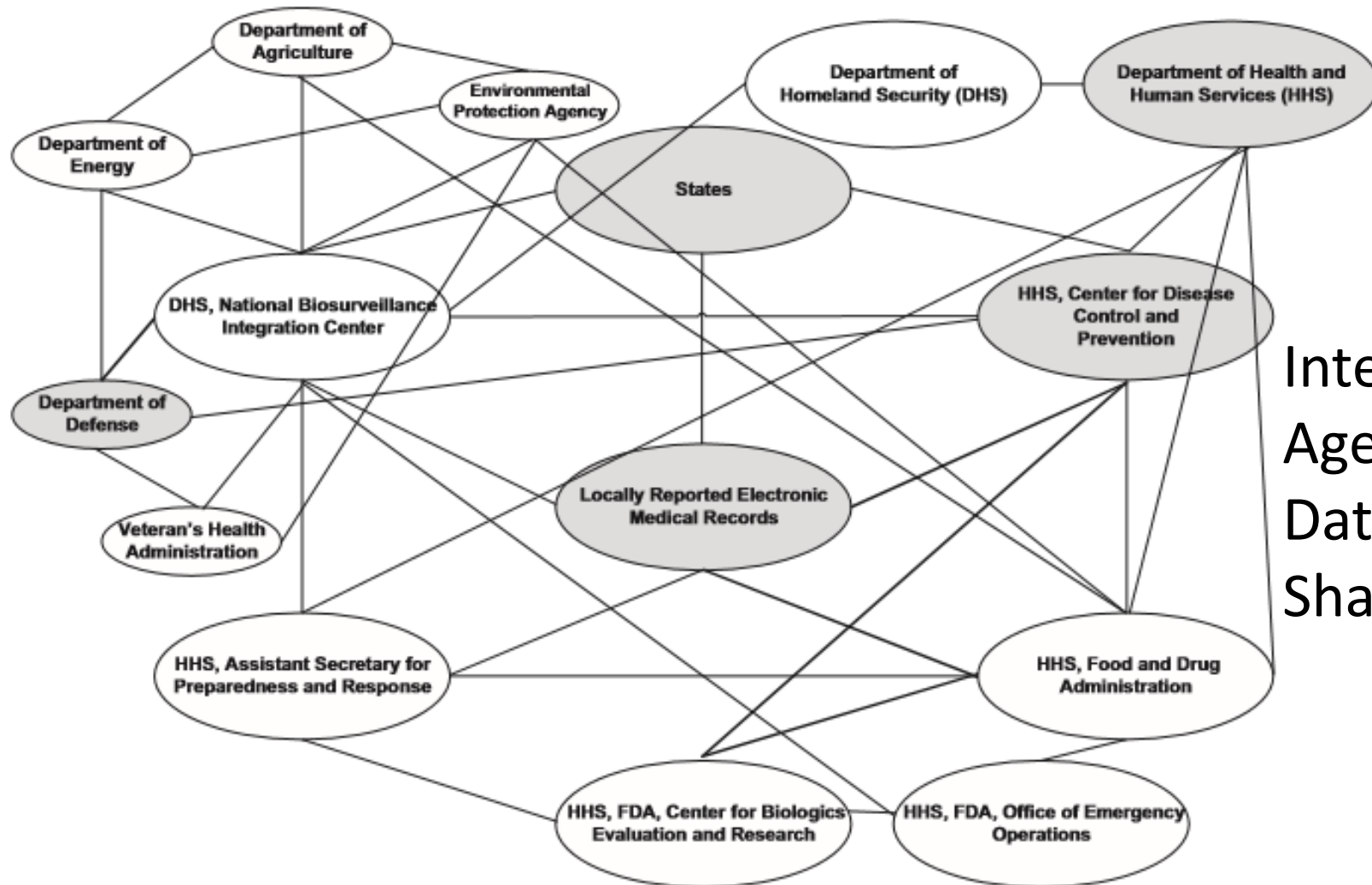




Optimizing Existing ICD Data Infrastructure

Notes: Departments of Agriculture, Commerce, Interior, Justice, State, Transportation, Veterans Affairs; the Environmental Protection Agency and the US Postal Service; International Classification of Diseases, 9th Revision (ICD-9)

Sources: Fiedler and Bebbler (2011); Fiedler *et al.* (2010)



Inter-
Agency
Data
Sharing

Primary Operatives

- Maintain long-term usability of historical frequency counts
- Introduce digital survey utilizing existing clinical and organizational scheduling systems
- Extend data collection and comparability between and among those who do not use digital activity trackers and those who do
- Optimize questions to provide opportunities to transform data for extended analysis
- Same data types for predictors and outputs to facilitate research
- Introduce new and adaptable measurement scales

Added Value

Secondary Operatives

- Long-term viability of incorporating actual medical device information through interoperability protocols and data exchange
- Increase usability of digital fitness devices
- Inter-agency data sharing
- Data field convergence

Extending Public Health Surveillance Reporting Through Digital Data Collection of Behavior Patterns and Existing Conditions

- Data Collection with clinically diagnosed health status using ICD codes promoting health economics and outcomes research (HEOR)
- Engages study participants through existing digitalization in patient clinical services and scheduling to maintain and potentially increase the annual study participation
- Utilizes append process to survey responses that incorporate wearable /activity tracking information until data field convergence
- Resolves one chance/one call problem of self-reported data collection via multiple opportunities to engage a potential study participant
- Maintains longevity of comparable historical data in frequency count format but incorporates adaptable measurement scales to increase analysis options
- Introduces advanced analysis methods that add value and statistical significance to reported data by adding tracked information from other agencies

Summary

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References

Appendix 1 Ordinary Least Squares Regression Variables and Sources

	Variables	Source	Geographic Level of Data
Independent Variables	Shared Use Policy in Existence (dummy variable; 1=yes, 0=no)	Safe Routes to School National Partnership State Report Card	State
	Safe Routes to School Score (0-200)	Safe Routes to School National Partnership State Report Card	State
	Percent of Population Living within ½-mile of a park	Behavioral Risk Factor Surveillance System (BRFSS)	State
	Percent of Population Living Below Poverty Level	U.S. Census Bureau : American Community Survey 5-year estimates	State
	Urban Population Percentage	U.S. Census Bureau (2010)	State
	Racial Majority Percentage- Percent of Population Identifying as White Alone	U.S. Census Bureau (2015)	State
	Mean Travel Time to Work (minutes)	U.S. Census Bureau : American Community Survey 5-year estimates	State
	Percentage of Population Living without Vehicle Availability	U.S. Census Bureau : American Community Survey 5-year estimates	State
Dependent Variables	Health Costs Per Capita	Kaiser Family Foundation	State
	Obesity among adults aged ≥ 18 years	CDC 500 Cities Project	City
	Cancer (excluding skin cancer) among adults aged ≥ 18 years		
	No Leisure-time Physical Activity among adults aged ≥ 18 years		
	High Blood Pressure among adults aged ≥ 18 years		
	Diagnosed diabetes among adults aged ≥ 18 years		
	Mental health not good for ≥ 14 days among adults aged ≥ 18 years		
	Physical health not good for ≥ 14 days among adults aged ≥ 18 years		