

# Creating an Ambulatory Preventive Care Database: Uses for Health Disparities

Cunegundo Vergara, MD, FACP  
Medical Director of Ambulatory Services  
Department of Medicine, Hartford Hospital

# WHY CREATE A DATABASE?

1. Quality of care indicators
2. Essential for research infrastructure
3. Pay-for-performance environment

# 1. Quality of care indicators

- Quality-driven healthcare
- Data-driven healthcare (Outcomes and cost-effectiveness)
- Benchmarking (quality of care and health disparities research) e.g. HEDIS and CORE measures

## 2. Essential component for research infrastructure

- Baseline data for future research
- Potential to expand the database
- Minimize manual extraction of data
- Successful research programs possess vast database

### 3. Pay-for-performance environment

- Medicare PQRI (voluntary currently)
- Private medical insurance carriers (United Healthcare and BlueCross)

# PHASES OF DATABASE CREATION

- PHASE I: PLANNING (longest and most important)
- Phase II: TECHNICAL (Fun part)
- Phase III: IMPLEMENTATION (Fun part)
- Phase IV: EXPANSION (Future)

# Planning phase: Data Factors

- Longest and most important phase
- Identify variables (data) of interest
- Identify sources of data of interest
- Identify format of data of interest
- Identify reliability of data of interest
- Identify funding and resources

# Identify data of interest

Planning phase: Data Factors

Be specific and exact !

- Demographics
- Clinical data
- Financial data
- Process data

# Identify data of interest

Planning phase: Data Factors

## Demographics

- Usual variables (age, sex, race)
- Health disparities variables (language, employment, marital status, religion, education, etc.)

# Identify data of interest

## Planning phase: Data Factors

### Clinical data

- Blood tests (cholesterol, HgbA1c, BUN/Cre, etc.)
- Radiology (DEXA, mammogram, barium enema, etc.)
- Procedures (Colonoscopy, breast or prostate biopsy, etc.)
- Office-based tests and procedures (PAP, Urinalysis, Immunizations, DRE/fecal occult blood, Hearing test, Snellen eye test, etc.)

# Identify data of interest

Planning phase: Data Factors

## Financial data

- Administrative claims data (i.e., accounts billable, service charge, etc.)
- Essential for cost-effective analysis
- Least important for clinicians and providers
- Most important for bean counters!

# Identify data of interest

Planning phase: Data Factors

## Examples of Financial data

- Cost of a tests
- Professional fee of PCP and subspecialists
- Facility fees
- Hospitalization costs

# Identify data of interest

Planning phase: Data Factors

## Process data

- Important for analysis of outcomes, resource utilization, and access to care
- Examples: Frequency of hospitalizations, ER visits, office visits, no-shows, etc.)

# Identify sources of data of interest

If data is available where do I get it?

- Demographics (registration department)
- Clinical data (diagnostic databases, medical records)
- Financial data (claims data)
- Process data (registration, claims data)

# Identify format of data of interest

## Electronic versus Hardcopy?

- Demographics (electronic)
- Clinical data (electronic and hardcopy)
- Financial data (electronic)
- Process data (electronic)

# Identify format of data of interest

## Data Format Issues

- Compatibility of software applications for combining electronic data
- Electronic data: "hard value" vs. PDF format
- Manual abstraction of hardcopy data (abstraction tool and personnel)
- Database input of manual data (personnel)

# Identify reliability of data of interest

- "Garbage in = Garbage out"
- Select data from sources with vested interest in maintaining data integrity
- Select data sources with up-to-date data

# Identify reliability of data of interest

## Examples of reliability

- **Demographics** (registration department) Registration personnel may fail to validate at time of visit
- **Clinical data** (diagnostic databases, medical records) Electronic databases highest reliability. Paper medical records notoriously unreliable
- **Financial data** (claims data)  
Claims data is fraught with inaccuracies but usually the only source of financial data.
- **Process data** (registration, claims data)

# Identify funding and resources

- Institutional support
- Funding (intramural and extramural)

# Phase II: Technical Creation

## Factors for Consideration

- Homegrown vs. commercially available
- User friendly database
- Ability for real-time queries and reports
- “Customizable” and Expandable
- Frequent briefings on progress of database creation

# Phase II: Technical Creation

## Homegrown vs. commercially available

- Homegrown (usually cheaper)
- Homegrown (more amenable for customization)
- Homegrown (Dependent on experience and skills)

# Phase II: Technical Creation

## User Friendly Database

- Easy to use
- Interface pleasant-appearing and inviting
- Easy to access but secure
- As fast a system as possible
- Minimize manual data entry\*

# Phase II: Technical Creation

Ability for real-time queries and reports

- Push of button convenience
- Avoid middleman
- Avoid institutional red-tape

# Phase II: Technical Creation

## "Customizable" and Expandable

- Allow for addition of new variables
- Allow for manual data entry and corrections
- Allow for use of existing data for future projects (1. preventive care access, 2. preventive care outcome, 3. other medical conditions)

# Phase II: Technical Creation

Set up frequent briefings on progress

- Catch mistakes earlier
- Saves time and effort in the long-run
- Allows for customization
- Provides detailed knowledge of database (i.e., strengths and limitations)

# Phase II: Technical Creation

## HH Adult Primary Care Preventive Care Database

- Homegrown
- 3 or more sources of non-compatible, electronic data: patient roster (*Excel*), financial software (*Siemens*), clinical software (*Eclypsis*)
- Combine all 3 via *Microsoft Access*
- Primarily measures access-to-care and not outcomes of care
- Funded by research grant

# Phase III: IMPLEMENTATION

- Not yet in effect for us (but soon)
- Note go-live date (Important for comparative analysis of any intervention)
- Select clinical intervention
- Determine future point for Comparative data analysis

# Phase III: IMPLEMENTATION

## HH Adult Primary Care Preventive Care Database

- Evidenced-based guidelines (e.g., USPTF, ADA, AAFP, etc.)
- HEDIS measures
- Standards of Care
- Well-defined eligibility criteria for each measure

# Phase III: IMPLEMENTATION

## HH Adult Primary Care Preventive Care Database

### Hartford Hospital Adult Primary Care Practice

- Ambulatory hospital-based
- 15,000-17,000 visits annually
- ~ 5000 unique patients
- Inner-city
- Medicaid(50%), Medicare(25%), Unnsured(20%), Commercially insured (<5%)
- 75% Hispanic
- 75% Hispanic are Puerto Rican
- >60% Spanish-speaking only

# Phase III: IMPLEMENTATION

## HH Adult Primary Care Preventive Care Database

### Preventive Care Database Quality Measures

- Cancer Screening
- Immunizations
- Metabolic Screening
- Osteoporosis Screening
- General Health Prevention
- Diabetes Mellitus Quality Measures
- Hepatitis Vaccination

# Phase III: IMPLEMENTATION

## HH Adult Primary Care Preventive Care Database

### Cancer Screening

- Colon Cancer
- Cervical Cancer
- Breast Cancer
- Prostate Cancer

# Phase III: IMPLEMENTATION

## HH Adult Primary Care Preventive Care Database

### Immunizations

- Flu Vaccination
- Pneumonia Vaccination
- Tetanus Booster (Td or Tdap)
- Hepatitis A and B Vaccination

# Phase III: IMPLEMENTATION

## HH Adult Primary Care Preventive Care Database

### Metabolic Screening

- Hyperlipidemia
- Diabetes Mellitus
- Hypertension
- Osteoporosis

# Phase III: IMPLEMENTATION

## HH Adult Primary Care Preventive Care Database

### General Health Maintenance

- Annual Physical Exam\*
- Annual Hearing test\*
- Annual Vision test\*

# Phase III: IMPLEMENTATION

## HH Adult Primary Care Preventive Care Database

### Disease-specific Quality of Care Measures

- Diabetes Mellitus
- Hypertension
- Hyperlipdemia

# Phase III: IMPLEMENTATION

## HH Adult Primary Care Preventive Care Database

### Diabetes Mellitus Quality of Care Measures

- HgBA1c
- Lipid Profile
- BUN/Creatinine
- Urine tests for protein or microalbumin

# Phase III: IMPLEMENTATION

## HH Adult Primary Care Preventive Care Database

### Hypertension Quality of Care Measures

- BUN/Creatinine\*
- Urine tests for protein or microalbumin\*
- Electrocardiogram (ECG)\*

# Phase III: IMPLEMENTATION

## HH Adult Primary Care Preventive Care Database

### Hyperlipidemia Quality of Care Measures

- Annual lipid profile
- Annual Liver function tests (LFTs)
- Creatine kinase (CK, CPK)\*

# Phase III: IMPLEMENTATION

## HH Adult Primary Care Preventive Care Database

- Evidenced-based guidelines (e.g., USPTF, ADA, AAFP, etc.)
- HEDIS measures
- Standards of Care
- Well-defined eligibility criteria for each measure

# Phase III: IMPLEMENTATION

## HH Adult Primary Care Preventive Care Database

### Example: Colon Cancer Screening

- Eligibility: All  $\geq$  50 years old (average risk)
- Quality measures (independent variables): Colonoscopy (every 10 years), Flexible Sigmoidoscopy (every 5 years), Double Contrast Barium Enema + Flexible Sigmoidoscopy (every 10 years), Fecal Occult (annual)
- Outcome measures (dependent variables): Colon Cancer, Colon Polyp, Hospital Admission, ER visit

# Phase III: IMPLEMENTATION

## HH Adult Primary Care Preventive Care Database

### Example: Colon Cancer Screening

- Eligibility: Age obtained from patient roster (Excel)
- Independent Variables: Obtained via financial software (*Siemens*) and clinical software (*Eclypsis*)
- Dependent Variables: Obtained via financial software (*Siemens*) and clinical software (*Eclypsis*)

# Phase III: IMPLEMENTATION

- Not yet in effect for us (but soon)
- Note go-live date (Important for comparative analysis of any intervention)
- Select clinical intervention
- Determine future point (s) for comparative data analysis

# Phase III: IMPLEMENTATION

## HH Adult Primary Care Preventive Care Database

- Go-live date: July 2009
- Clinical intervention: Provide individual report cards to primary care providers regarding colon cancer quality indicators and other indicators
- Determine future point for comparative data analysis: Quarterly or biannually

# Phase IV: EXPANSION

## (Future)

- Obtain quality data for other medical conditions (e.g., asthma, heart failure, CAD, thyroid disease, etc.)
- Correlate disease-specific data to access to preventive care
- Manual entry of “hard value” of test results or procedures (outcomes of care vs. access-to-care analysis)
- Cost-effective analysis

# Phase IV: EXPANSION

## (Future)

- Baseline data for de novo research
- Assess other clinical interventions (e.g., provider education, patient education, case management, etc) effect on access-to-care and outcomes-of-care
- Modify and submit data for pay-for-performance programs



**QUESTIONS?**

Thank You!