



# Optum Labs Overview

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Bijan J. Borah, Ph.D.

Mayo Clinic College of Medicine, Rochester, MN

Prevention Committee Meeting, May 13, 2016

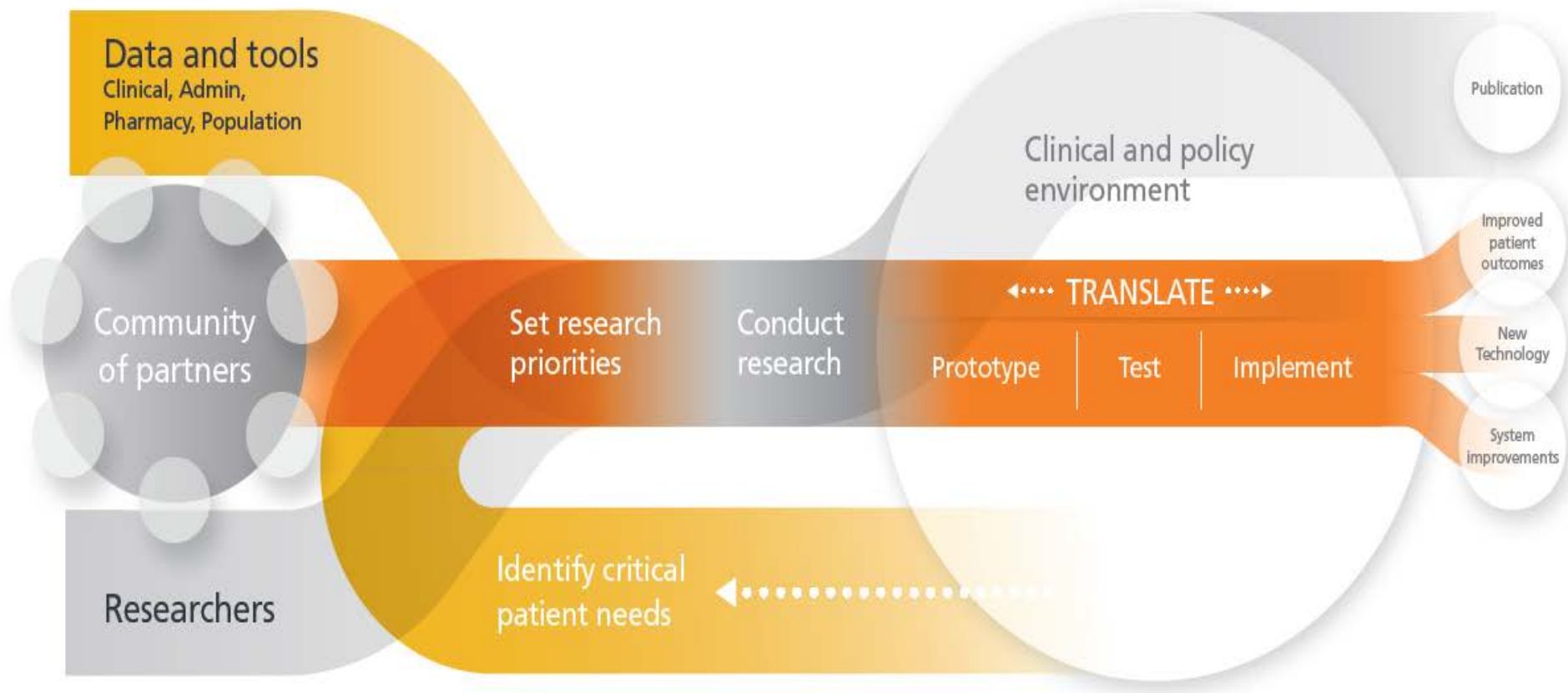
# Objective

- To provide an overview of Optum Labs

# Optum Labs

- Founded as a partnership between Optum and Mayo Clinic in January 2013
- Optum Labs provides data and analytic resources
- Clinical, academic, and policy partners provide scientific and medical knowledge, and enable translation to improve patient care

# Optum Labs



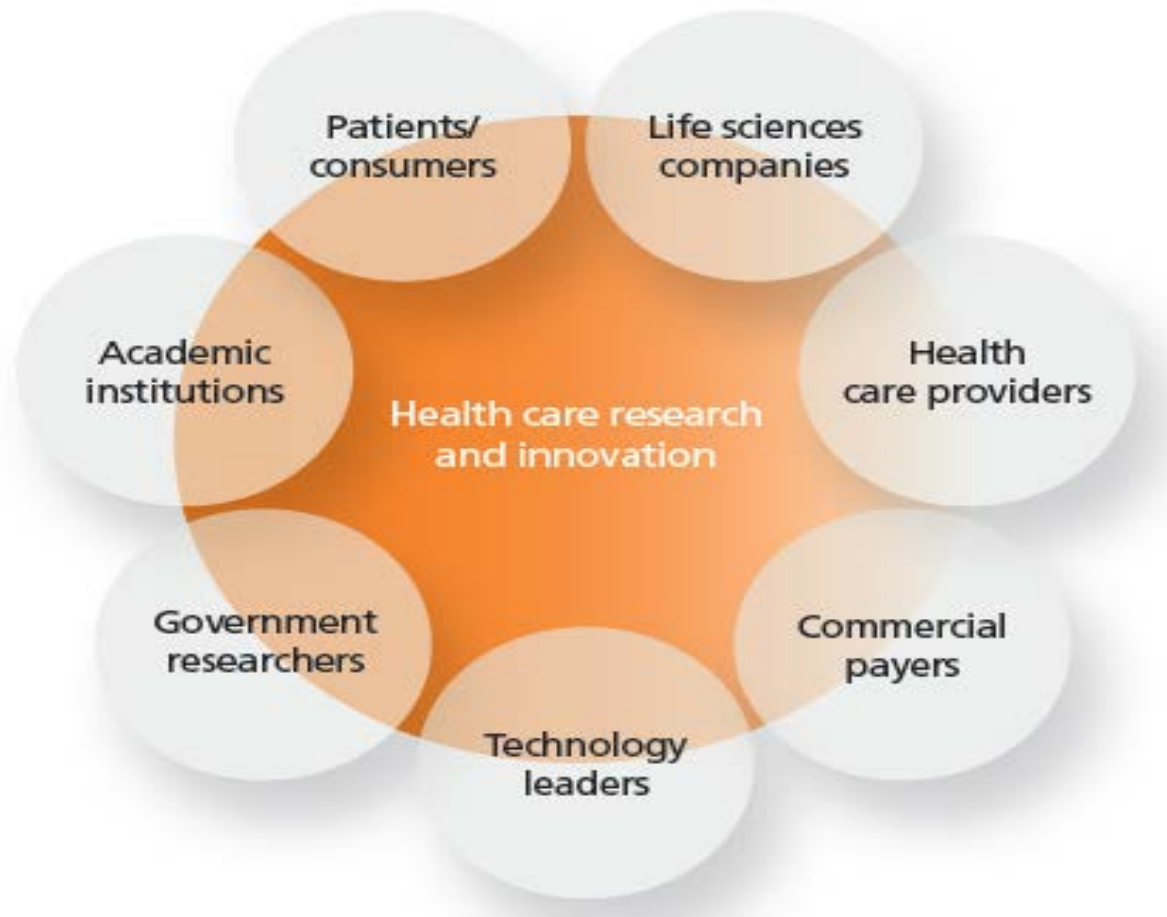
# Optum Labs

- Improving patient care through collaborative research and innovation
- Research that can directly benefit patients and population health
  - Comparative effectiveness research
  - Cost and value
  - Behavioral research
  - Health policy and health care delivery
  - Variation in care delivery and health outcomes
  - Management of multiple chronic conditions

# Optum Labs

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A partnership of perspectives

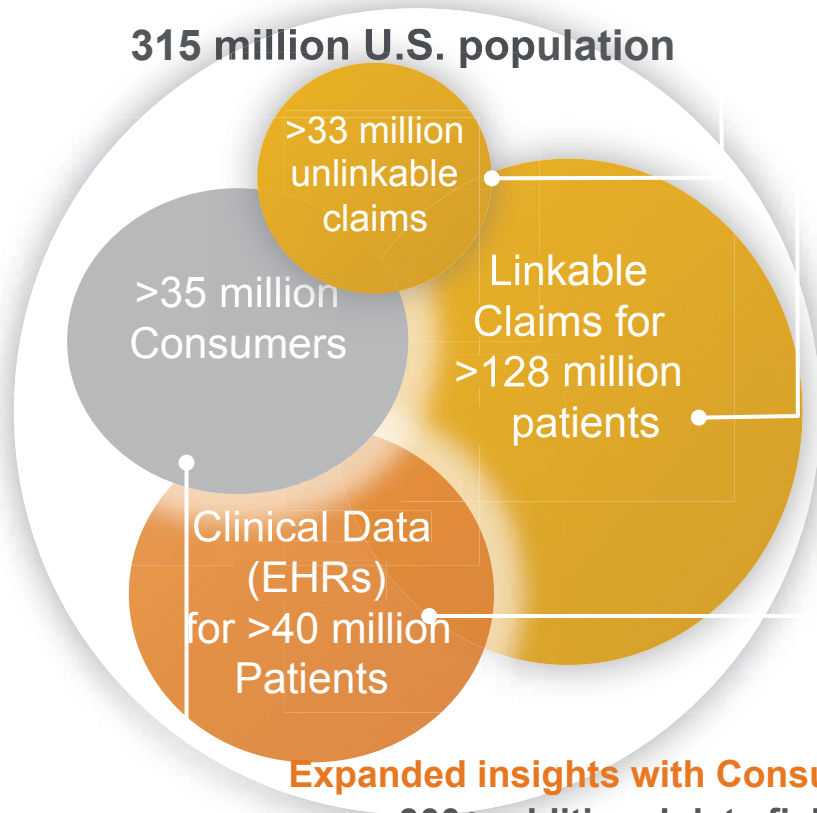


# Optum Labs Partners – more on the way



# Optum Labs Data: Claims, EHRs and Consumer Behavior

315 million U.S. population



**Expanded insights with Consumer data**

**300+ additional data fields:**

- Consumer Behavior: general trends
- Demographic view including Income,, Education Level, Marital Status, Occupation,
- Psychographic Data including interest and participation in : travel, various leisure activities, charitable giving, advocacy, volunteering, community involvement

**1,500+ data fields:**

- Medical claims
- Pharmacy claims
- Lab claims and results
- Health risk assessments
- Costs of care
- Race
- Income
- Education level
- Household
- Geography

**Tests, Treatments**

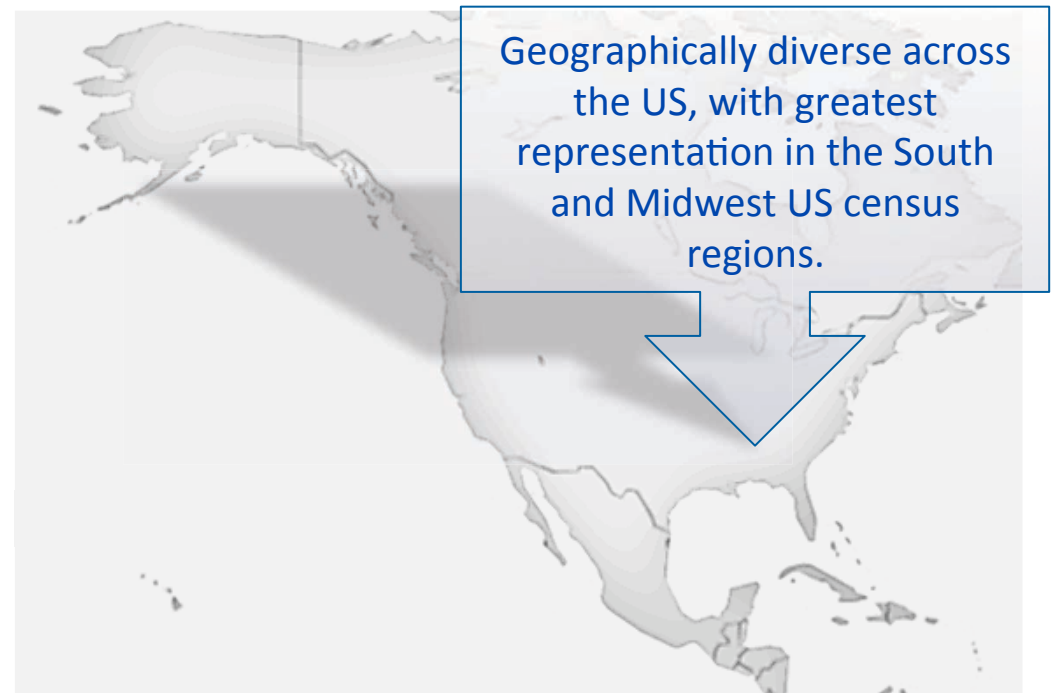
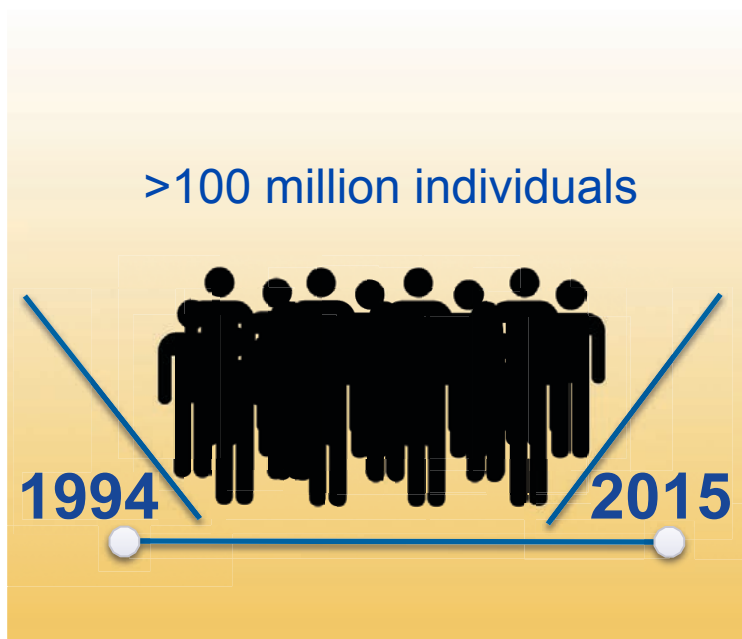
**Expanded insights with deeper clinical context**

**250+ additional data fields:**

- Encounters
- Vitals (BMI, BP, Heart Rate ...)
- Labs
- Medication orders
- Procedures
- Admissions, discharges and transfers
- Patient-provided information



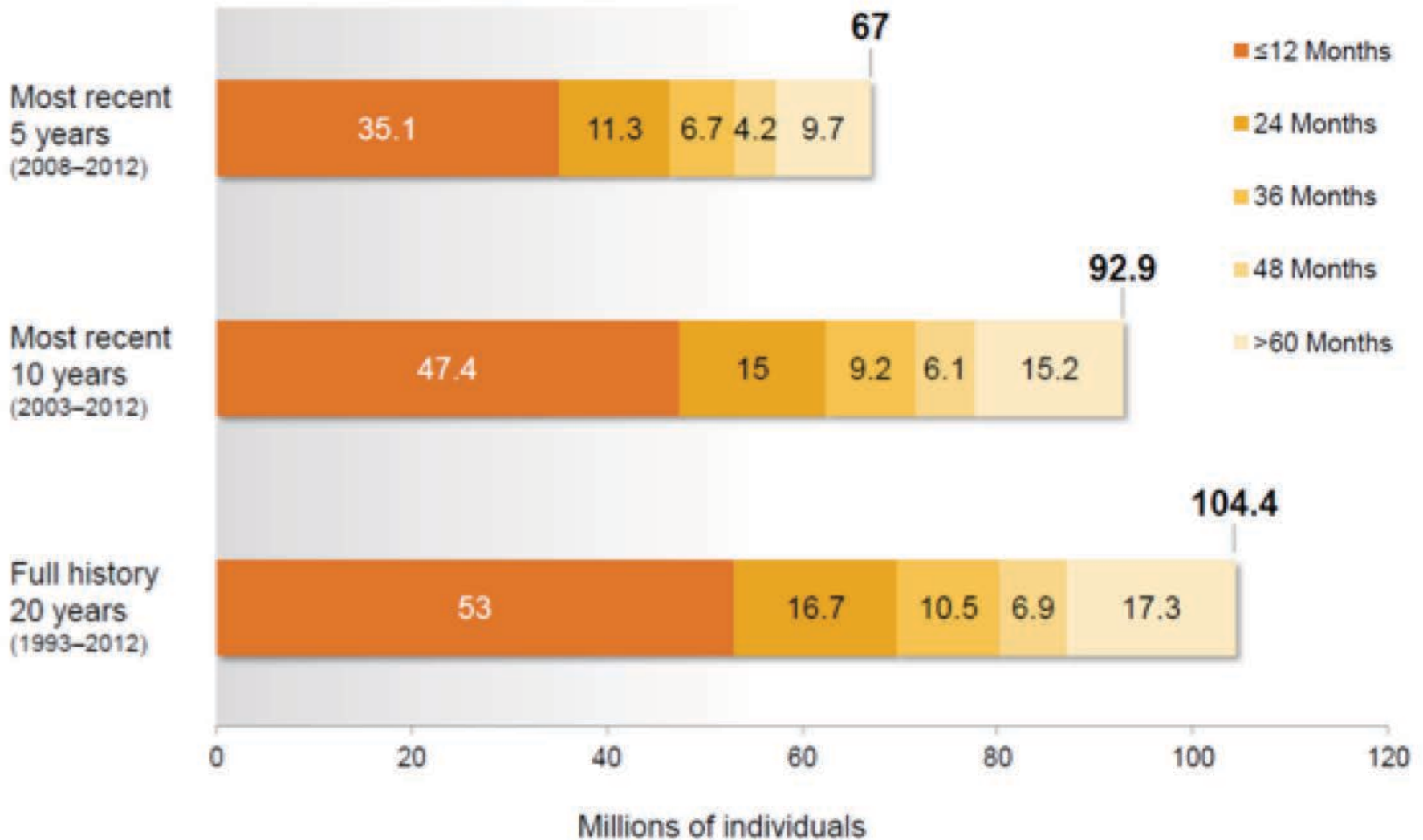
*Currently,* the data reflect the linkage of large claims data sources that provide detailed health care services information about privately-insured and a number of Medicare Advantage beneficiaries.



# Optum Labs Population over the Last Decade (2004-present)

- Commercially covered life
  - *Primary* Medical Coverage
    - 78 Million Enrollees
  - *Primary* Medical **and** Pharmacy Coverage
    - 47 Million Enrollees
- Medicare Advantage (Medicare Part C):
  - *Primary* Medical Coverage
    - 4.8 Million Enrollees
  - *Primary* Medical **and** Pharmacy Coverage
    - 4.7 Million Enrollees

# Individuals with Continuous Enrollment



# Optum Labs Data Warehouse

<ul style="list-style-type: none"> <li>• Family link</li> <li>• Continuous Coverage               <ul style="list-style-type: none"> <li>• Plan</li> </ul> </li> <li>• Geographic location</li> <li>• Gender</li> <li>• Age</li> <li>• Dates of eligibility</li> </ul>	<ul style="list-style-type: none"> <li>• Prescribing physician ID</li> <li>• Pharmacy ID               <ul style="list-style-type: none"> <li>• Drug dispensed (NDC)</li> <li>• Date dispensed</li> </ul> </li> <li>• Drug strength</li> <li>• Days supply               <ul style="list-style-type: none"> <li>• Dollar amounts</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Provider ID</li> <li>• Procedures (CPT4, revenue codes, ICD9)</li> <li>• Diagnosis (ICD9)</li> <li>• Admission, discharge dates, LOS</li> <li>• Provider specialty</li> <li>• Date and place of service</li> <li>• Actual paid amounts</li> </ul>	<ul style="list-style-type: none"> <li>• Lab test name</li> <li>• LOINC codes               <ul style="list-style-type: none"> <li>• Result (numeric and text)</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Income</li> <li>• Net worth</li> <li>• Education</li> <li>• Race and ethnicity</li> </ul>	<ul style="list-style-type: none"> <li>• Results</li> <li>• Orders</li> <li>• Sensitivity</li> <li>• Medications</li> <li>• Vital signs</li> <li>• Social history</li> <li>• Diagnosis/procedures</li> <li>• Encounters</li> <li>• Patient event</li> </ul>	<ul style="list-style-type: none"> <li>• Height</li> <li>• Weight</li> <li>• Tobacco use</li> <li>• Other metrics (based on U of Michigan HRA)</li> </ul>	<ul style="list-style-type: none"> <li>• Month and year of death (from SSA)</li> </ul>
Enrollment	Pharmacy claims	Physician and facility claims	Lab test results	Socio-economic status (SES)	Clinical (EMR/EHR)	Health Risk Assessment	Date of death (DOD)

# Optum Labs Data Warehouse



AHA

Plan Benefit Data

# Strengths...

## Why use administrative data

- OLDW Administrative Data are in electronic format and contains information about: (**timely** and **consistency** in report)
  - Services that are to be paid (The numerator)
  - Information about the enrollees whose services are to be paid (The denominator, eligible population)
  - Medications dispensed (vs. prescribed)
- Complete capture of patient level data
  - diagnosis, procedures, dates of service, source of care
- Demographic information is primarily reliable
  - Age, gender, state of residence, **date of death (limited)**

# Strengths...

## Why use administrative data

- Large population base
  - In Optum Labs we can study approximately 100 million fully covered lives longitudinally
    - Allows for detailed sub-group analysis
    - Little worry about statistical power
- Can be combined with other data sources\*
  - Linking can take place at the group level based on geography, place of service, or at the patient level with external data sources
    - American Hospital Association
    - *Area Resource File*
    - *Provider information*
    - *Cancer Registries*
    - *Clinical data*



depends on view access

# Limitations...Broad limitations of claims data?

- Conditions must be diagnosed
  - depression, obesity, hypertension may often be underdiagnosed
- Exact timing not included:
  - hours from admission to event
  - time of day for ED visits
- Drugs and procedures can have multiple indications
- Diagnosis may not provide enough detail
  - cancer stage or histology
- Inpatient Detail (i.e. medications administered, lab tests, events, interventions)
- Limited Clinical Information (BMI, ejection fraction)

# Limitations...Broad limitations of claims data?

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- Different care settings use different coding systems for procedures
  - Inpatient Care ICD-9
  - Hospital outpatient care is coded as a mix of CPT and revenue center codes
  - Physician claims are coded using CPT codes and HCPCS
- Data limited to covered benefits
  - Covered services for which claims are not submitted
  - Some services are not covered
  - Not all enrollees have pharmacy coverage
- Lab Panels
  - Lack detail when panels are ordered



**Supplemental/Linked Data  
(limited population):  
AHA, HRA, Labs, SES, Clinical,  
Oncology Data...**

# Lab Results

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- ~30% of Patients have at least one lab test result
  - Procedure CPT code
  - Lab test name
  - LOINC codes
  - Result (numeric and text)

*Caution: not all lab results for a particular person*

**Tip:** Interested in Lab Tests, use Physician Claim



# SES: Consumer Profile

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- Race/Ethnicity (all views)
  - Asian, Black, Hispanic, White, Unknown
- Education (SES view)
  - Less than 12<sup>th</sup>, High School, Less than Bach, Bach Degree Plus
- Household Income (SES view)
  - <\$40K, \$40-49K, \$50-59K, \$60-74K, \$75-99K, \$100K+
- Home Ownership(SES view)
  - Probable Homeowner
- Net Worth Range (SES view)
  - <\$100k, \$100K-\$199,999, \$200K-\$349,999, \$350K+

# American Hospital Association Survey

- Timeframe 2006 to 2012 Surveys (full files)
  - Data can currently be used with any view. However, there are various variable roll-ups to protect patient privacy.
  - Project by Project approval
- Variables (over 1,000 variables)
  - Bed Size (1-49, 50-199, 200-399, 400+)
  - Rural vs. Urban
  - Control Code (Government, non-for-profit, for-profit)
  - Primary Service (i.e. heart, cancer, rehab, psych, long-term)
  - Total # of Admissions
  - Total # of Discharges
  - Teaching

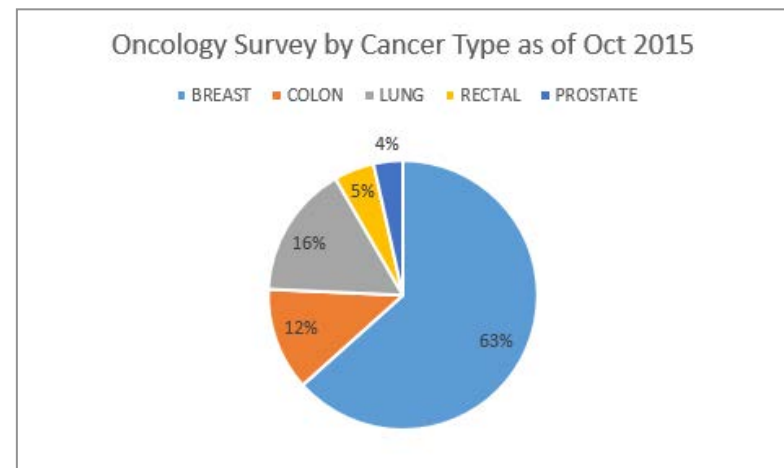
# Clinical Data - TBD

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- Humedica, EMR analytics tool for health care providers
- Approximately 40 Million
- Timeframe 2010 to 2015
  - Data varies by facility; laboratory results, medications administered, procedures, diagnoses, problem list, vitals
  - Data include NLP abstracted variables – to be explored.
- First 2 studies/validation:
  - AMI and Performance Measures
    - Specifically Aspirin Use
  - Heart Failure and EF
    - Range of EF, Measure of EF, Validation of Billing codes

# Oncology Management Data

- Data provided by physicians' as a response to a survey on selected clinical information:
  - Breast
  - Lung
  - Colorectal
  - Prostate
- Timeframe 2008 – 2014
- Approximately 76,000 patients
- Data collected, such as stage, date of diagnosis, histology, tumor type.



# Examples of studies that can be conducted using administrative data

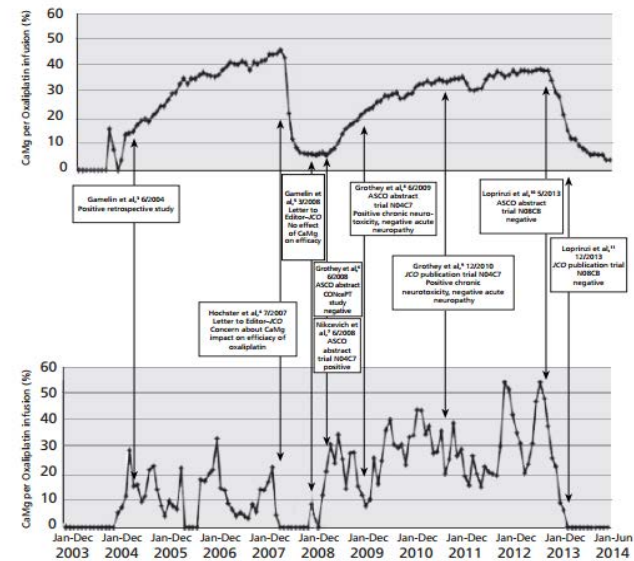
- Longitudinal studies
  - Variation in utilization and outcomes of total hip and knee replacements in the US
- Variation in treatment patterns
  - Hospital readmissions among patients with diabetes
  - HbA<sub>1c</sub> testing frequency among low risk diabetes patients
- Comparative effectiveness of different treatment options
- Behavioral and Policy research
  - How do copays on medications influence adherence?
  - How do high deductible plans influence utilization?

# Calcium and Magnesium Use for Oxaliplatin-Induced Neuropathy: A Case Study to Assess How Quickly Evidence Translates Into Practice

Deirdre R. Pachman, MD<sup>a</sup>; Kathryn Ruddy, MD<sup>a</sup>; Lindsey R. Sangaralingham, MPH<sup>b</sup>; Axel Grothey, MD<sup>a</sup>; Nilay D. Shah, PhD<sup>c,d</sup>; Andreas S. Beutler, MD<sup>a</sup>; Joleen M. Hubbard, MD<sup>a</sup>; and Charles L. Loprinzi, MD<sup>a</sup>

Rapid adoption of evolving evidence over the past decade regarding use of intravenous CaMg to prevent oxaliplatin-associated neuropathy.

Although the relevant scientific evidence, until recently, was based on small, sometimes retrospective, studies, clinicians clearly did change practice quickly in response to the referenced studies.



**Figure 1** Use of calcium and magnesium (CaMg) over time, including Optum data (top) and Mayo data (bottom), depicted with reference to the discussed publications/presentations. Online publication dates are used when available.



# Submission of a project request

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- Every project requires an engaged clinical proponent
  - Define research questions
  - Ensure effective dissemination and translation
- Preliminary Research Application (**PRA**)
  - Forms available from Tyler Huerter or Lindsey Sangaralingham
  - Prioritized by CSHCD (with liaison support)
  - Reviewed/approved by Research Review Committee
- PRA approval, then...
- Detailed Research Application (**DRA**)
  - Details needed to create dataset and conduct analysis, project plan
  - Outlines plans for dissemination and translation
  - Reviewed/approved by Research Review Committee and Optum Labs Oversight Council

# Mayo Team

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- Medical Directors: Dr. Veronique Roger, Dr. Jay Talwalkar
- Scientific Director: Dr. Nilay Shah
- Administrator: TBD
- Project Assistant: Tyler Huerter
- Statistician: Dr. Jeph Herrin (Yale, 20%)
- Research Associate: Dr. Xiaoxi Yao
- Master Analysts: Lindsey Sangaralingham, Holly Van Houten, Herb Heien
- Statistical Analysts: Stephanie Schilz, Raphael Mwangi, Dennis Asante
- Our clinical partners

# Publications

1. Calcium and Magnesium Use for Oxaliplatin-Induced Neuropathy: A Case Study to Assess How Quickly Evidence Translates Into Practice. Pachman DR, Ruddy K, Sangaralingham LR, Grothey SA et al.
2. Trends and predictors of readmission after catheter ablation for atrial fibrillation, 2009-2013. Noseworthy PA, Kapa S, Haas LR, Van Houten H, et al
3. Use of Post-Acute Care Services and Readmissions after LVAD Implantation in Privately Insured Patients. Dunlay SM, Haas LR, Herrin J, Schilz SR, Stulak JM, Kushwaha SS, Shah ND. J Card Fail.
4. Comparative Risk of Gastrointestinal Bleeding with Dabigatran, Rivaroxaban and Warfarin. Abraham NS, Singh S, Alexander CG, Heien H, Sangaralingham LR, Crown W, Shah ND. BMJ
5. Risk of stroke after catheter ablation versus cardioversion for atrial fibrillation: a propensity matched study of 24,316 patients. Noseworthy PA, Kapa S, Deshmukh AJ, Madhavan M, Van Houten H, Sangaralingham LR, Mulpuru SK, McLeod CJ, Asirvatham SJ, Friedman PA, Shah ND, Packer DL. Heart Rythm Journal
6. Use of the Optum Labs Database to Assess Test Ordering Patterns for Diagnosis of Helicobacter pylori Infection in the United States. Theel ES, Johnson RD, Plumhoff EA, Hanson CA. Journal of Clinical Microbiology
7. Optum Labs- Building a Novel Node in the Learning Health Care System. Wallace PJ, Shah ND, Dennen T, Bleicher PD, Crown WH. Health Aff (Millwod) 2014 Jul; 33(7)
8. Review of Propensity Score Matching in Comparative Effectiveness Research. Borah BJ, Moriarty JP, Crown WH, Doshi JA. Journal of Comparative Effectiveness Research.
9. Second-line Agents for Glycemic control in Type 2 Diabetes. Zhang Y, McCoy RG, Mason JE, Smith SA, Shah ND, Denton BT. Diabetes Care
10. Use and Out-of-Pocket Costs of Insulin for Type 2 Diabetes Mellitus from 2000 to 2010. Lipska KJ, Ross JS, Van Houten HK, Beran D, Yudkin JS, Shah ND. JAMA

# Questions & Discussion

