Improving care and increasing patient value through collaborative discovery and innovation.
With thought leaders from across the health care ecosystem assembled and robust research underway, 2015 was the year of leveraging OptumLabs’ collaborative environment to drive discovery. Grounded in big data and elevated by new and diverse perspectives, a variety of initiatives launched to push the needle on improving patient care and patient value.

In the following sections, you’ll learn how the work of OptumLabs in 2015 illustrates the theme of this report — building on research and collaboration to accelerate discovery.
In 2015, we added new partners to grow our collaborative and expand perspectives to tackle health care’s biggest challenges.

<table>
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<tr>
<th>New partners</th>
<th>Current collaborators</th>
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<tr>
<td><strong>Yale</strong></td>
<td>Partners</td>
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<tr>
<td><strong>U.S. Department of Health and Human Services</strong></td>
<td>• Mayo Clinic</td>
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<tr>
<td>• Administration for Children and Families (ACF)</td>
<td>• AARP</td>
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<td>• Administration for Community Living (ACL)</td>
<td>• AMGA</td>
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<td>• Agency for Healthcare Research and Quality (AHRQ)</td>
<td>• Pfizer</td>
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<td>• Agency for Toxic Substances and Disease Registry (ATSDR)</td>
<td>• Lehigh Valley Health Network</td>
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<tr>
<td>• Assistant Secretary for Administration (ASA)</td>
<td>• Rensselaer Polytechnic Institute</td>
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<td>• Assistant Secretary for Financial Resources (ASF)</td>
<td>• University of Minnesota School of Nursing</td>
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<td>• Assistant Secretary for Global Affairs (ASGA)</td>
<td>• Tufts Medical Center</td>
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<td>• Assistant Secretary for Health (ASH)</td>
<td>• Boston University School of Public Health</td>
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<td>• Assistant Secretary for Legislation (ASL)</td>
<td>• Harvard Medical School</td>
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<td>• Assistant Secretary for Planning and Evaluation (ASPE)</td>
<td>• MIT Sloan School of Management</td>
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<td>• Assistant Secretary for Preparedness and Response (ASPR)</td>
<td>• Boston Scientific</td>
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<td>• Assistant Secretary for Public Affairs (ASPA)</td>
<td>• The Johns Hopkins University</td>
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<td>• Centers for Disease Control and Prevention (CDC)</td>
<td>• University of Maryland – Baltimore</td>
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<td>• Centers for Medicare and Medicaid Services (CMS)</td>
<td>• Brown University School of Public Health</td>
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<td>• Departmental Appeals Board (DAB)</td>
<td>• Medica Research Institute</td>
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<td>• Food and Drug Administration (FDA)</td>
<td>• ResMed</td>
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<tr>
<td>• Health Resources and Services Administration (HRSA)</td>
<td>Sponsors</td>
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<tr>
<td>• Immediate Office of the Secretary (IOS)</td>
<td>• AstraZeneca</td>
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<td>• Indian Health Services (IHS)</td>
<td>• Janssen</td>
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<td>• National Institutes of Health (NIH)</td>
<td>• National Health Council</td>
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<td>• Office for Civil Rights (OCR)</td>
<td>• Optum Analytics</td>
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<td>• Office of Inspector General (OIG)</td>
<td>Advisory Board/TEP Members</td>
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<tr>
<td>• Office of Intergovernmental and External Affairs (IEA)</td>
<td>• Brigham and Women’s Hospital</td>
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<td>• Office of Medicare Hearings and Appeals (OMHA)</td>
<td>• Valley Health System</td>
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<td>• Office of the General Counsel (OGC)</td>
<td>• American Heart Association</td>
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<tr>
<td>• Office of the National Coordinator for Health Information Technology (ONC)</td>
<td>• Mayo Clinic</td>
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<tr>
<td>• Substance Abuse and Mental Health Services Administration (SAMHSA)</td>
<td>• AARP</td>
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| American Cancer Society |  |
| University of Rochester |  |
| **Yale** |  |
| **Hospital** |  |
| **University** |  |
| **Research** |  |
| **Health** |  |
| **Education** |  |
| **Service** |  |
| **Innovation** |  |
| **Sustainability** |  |
| **Leadership** |  |
| **Community** |  |
| **Global** |  |

**Sponsors**
- AstraZeneca
- Janssen
- National Health Council
- Optum Analytics

**Advisory Board/TEP Members**
- Brigham and Women’s Hospital
- Valley Health System
- American Heart Association
- Mayo Clinic
- AARP
- University of Maryland, Baltimore
- Boston Scientific
- UnitedHealthcare
- National Health Council
- Age UK
- Imperial College
- The Johns Hopkins University
- AMGA
- Yale
2015 ADVANCEMENTS AT A GLANCE:

150+ PROJECT PROPOSALS
across diverse topics
utilization epidemiology safety comparative effectiveness
methods prediction economics policy
comparative effectiveness

100+ PRINCIPAL INVESTIGATORS
across domains
cardiovascular multimorbidity oncology diabetes
prevention orthopedic diagnostics neurology

23 PUBLICATIONS RESEARCH OUTCOMES in high-impact journals

30+ PRESENTATIONS at national and global conferences

A rise in projects involving CROSS-PARTNER COLLABORATIONS

AARP + Mayo Clinic research trends in the use of hospital observation status service over time.

Mayo Clinic + Yale collaborate to examine the impact of tight glycemic control in complex patients.

AARP + Johns Hopkins University + University of California, San Francisco (external collaborator) launch a proof of concept project for the NQF Measures Incubator with OptumLabs on homebound measures.

AND MORE.
BROAD COLLABORATION

THE U.S. BIG DATA RESEARCH INITIATIVE TO FIGHT ALZHEIMER’S DISEASE

Global CEO Initiative on Alzheimer’s Disease (CEOi) launched a program to harness the power of big data, accelerating the pace of Alzheimer’s research.

- Sponsorship from AstraZeneca, Janssen and Optum®.
- Advisory board formed with representation from AARP, UnitedHealthcare, Mayo Clinic, University of Maryland, Baltimore, National Health Council and Age UK.
- Two foundational projects underway: claims-based predictive model with University of Maryland, Baltimore and National Language Processing (NLP) development with Optum Analytics.

NQF MEASURES INCUBATOR WITH OPTUMLABS

An array of stakeholders, data partners and experts convened to facilitate the development of measures that matter.

- A proof of concept program launched with five OptumLabs partners — Mayo Clinic, AARP, University of Maryland, Baltimore, The Johns Hopkins University and AMGA — to conduct measure projects in: complex comorbidity, Alzheimer’s disease and homebound patients.

DATA SCIENCE

HEART FAILURE CLUSTERS

A cross-functional team of data scientists, researchers and clinical experts collaborated to design and develop initial patient clusters using a hybrid approach of machine learning — guided by and refined with clinical experts — to create potential for personalized care management.

- Multi-stakeholder technical expert panel (TEP) engaged in cluster validation — Mayo Clinic, Yale, Boston Scientific, Brigham and Women’s Hospital, Valley Health System, Imperial College London, UnitedHealthcare and American Heart Association.
  - Spring 2015 — First TEP convened to review the OptumLabs research portfolio and the potential significance of patient clustering.
  - Fall 2015 — Second TEP convened to confirm the face validity of initial patient clustering outcomes and establish short- and long-term priorities for enhancements.
**INNOVATION**

**OPTUM® COMMUNITY HEALTH (OCH)**

Optum® CommunityHealth (OCH) is a dataset designed to enable a deeper understanding of variations in care and outcomes at the community level. OCH communicates how the local health care ecosystem — social determinants, community outcomes, health system attributes — can influence outcomes and spending.

- OptumLabs is integrating OCH into Health Plan Manager, an existing Optum product used by employers to analyze employee population health and inform benefits programs.

- OCH enables large national employers to understand the local headwinds their employees may face in different markets and places.

- Employers can adjust the various drivers of outcomes to model their impact on a community and prioritize interventions and programs.

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**ADVANCEMENTS IN DATA**

**CENTERS FOR MEDICARE & MEDICAID SERVICES (CMS) QUALIFIED ENTITY (QE) STATUS**

OptumLabs achieved Qualified Entity (QE) status with the CMS. This program allows organizations to apply for CMS data access to link with a large claims dataset for the purpose of public reporting on quality measures.

- Successful completion of this first phase in the application process is an endorsement of an organization’s ability to securely house data, link data with other sources and efficiently report on the data.
OPTUMLABS RESEARCH & TRANSLATION FORUM

On November 18–19, 2015, our second-annual signature event showcased research and translation thought leadership, project results sharing and inter-partner collaboration opportunities. The broadest range of OptumLabs partners were represented by 150 attendees.

• Pre-event workshop — Integrated Claims and Clinical Data in Action
  Provided an overview of OptumLabs clinical data, the use of natural language processing (NLP) to create structured data, and applications in the use of linked clinical and claims data in research.

• Day 1 — Big data’s influence on the Triple Aim, opportunities and challenges in the use of linked data, updates on performance measure development and research constellations, interactive partner presentation sessions across a variety of research and translation topics.

• Day 2 — Collaborative workshops and panels focused on bringing the consumer, patient and caregiver voice into the design of research; the integration of patient-reported outcomes (PROs) data, approaches to more meaningful and effective person-centered translation initiatives.

Keynote presentations:

• Leading Transformational Change: Pathways to the Triple Aim — Maureen Bisognano, RN, MS, President and CEO, Institute for Healthcare Improvement

• Behavioral Economics and New Models for Health Care Delivery — Kevin Volpp, MD, MPH, Professor of Medicine and Health Care, University of Pennsylvania Perelman School of Medicine

• Data Visualization: Making Data More Human — Jer Thorp, Data Artist and former Data Artist in Residence, The New York Times

• Reflecting on ‘Patient Centeredness’ — Joe Selby, MD, MPH, Executive Director, PCORI

• Using Communications to Create Behavior Change — Martha Boudreau, Executive Vice President, Chief Communications & Marketing Officer, AARP
OptumLabs partners achieved 23 publications of research outcomes in high-impact journals.

Applying dynamic simulation modeling methods in health care delivery research — The SIMULATE checklist: Report of the ISPOR simulation modeling emerging good practices task force
*Value in Health*

Star power: Angelina Jolie’s personal story of BRCA1 mutation on testing rates among commercially insured women
*AARP Insights on the Issues*
Walker L, Morin P. Jan 2015

Potential application of machine learning in health outcomes research and some statistical cautions
*Value in Health*
Crown WH. March 2015

Selecting a dynamic simulation modeling method for health care delivery research — Part 2: Report of the ISPOR dynamic simulation modeling applications in health care delivery research emerging good practices task force
*Value in Health*

Use of the OptumLabs data warehouse to assess test ordering patterns for diagnosis of Helicobacter pylori infection in the United States
*Journal of Clinical Microbiology*
Theel ES, Johnson RD, Plumhoff EA, Hanson CA. April 2015

Comparative risk of gastrointestinal bleeding with dabigatran, rivaroxaban and warfarin: Population-based cohort study
*The BMJ*
Abraham NS, Singh S, Alexander CG, et al. April 2015

Effect of antiarrhythmics drug initiation on readmission after catheter ablation for atrial fibrillation
*Journal of the American College of Cardiology — Clinical Electrophysiology*

Long-term outcomes after stepping down asthma controller medications: A time-to-event analysis
*CHEST Journal*

*American Journal of Managed Care*

Risk of stroke after catheter ablation versus cardioversion for atrial fibrillation: A propensity matched study of 24,244 patients
*Heart Rhythm*

Trends and predictors of readmission after catheter ablation for atrial fibrillation, 2009–2013
*American Heart Journal*
Noseworthy PA, Kapa S, Haas LR, et al. Sep 2015

Calcium and magnesium use for oxaliplatin-induced neuropathy: A case study to assess how quickly evidence translates into practice
*Journal of the National Comprehensive Cancer Network*
Can statistical linkage of missing variables reduce bias in treatment effect estimates in CER studies?
*Journal of Comparative Effectiveness Research*

Transforming healthcare delivery: Integrating dynamic simulation modelling and big data in health economics and outcomes research
*PharmacoEconomics*

Impact of the Medicare Hospital Readmission Reduction Program on hospital readmissions following joint replacement surgery
*AARP Insights on the Issues*

Trends and predictors of repeat catheter ablation for atrial fibrillation
*American Heart Journal*

Use of post-acute care services and readmissions after left ventricular assist device implantation in privately insured patients
*Journal of Cardiac Failure*

The next frontier: Fostering innovation by improving health data access and innovation
*Clinical Pharmacology & Therapeutics*

Photon and proton radiation therapy utilization in a population of over 100 million commercially insured patients
*International Journal of Radiation Oncology*

Pacemaker implantation after catheter ablation for atrial fibrillation
*Journal of Interventional Cardiac Electrophysiology*

Patterns of anticoagulation use and cardioembolic risk after catheter ablation for atrial fibrillation
*Journal of the American Heart Association*

HbA1c overtesting and overtreatment among US adults with controlled type 2 diabetes, 2001–13: Observational population based study
*The BMJ*
McCoy RG, Van Houten HK, Ross JS, Montori VM, Shah ND. Dec 2015

Clinical prevalence (diagnosed cases) of monoclonal gammopathy of undetermined significance in the US: Estimating the burden on health care
*Leukemia*