Big Data
The Purposeful Health Journey

http://consultant.uhc.com
Driving results through individual health ownership

INFORMATION that motivates
INTEGRATION that simplifies
INNOVATION that empowers

Personalized experience
Health plan design & cost sharing
Network design & transparency

Simpler member experience
Better outcomes
Lower costs

Population health & productivity
Today’s Session:
Big Data: The Purposeful Health Journey

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Health Plan Design & Innovation
UnitedHealth Group

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Vice President
Strategic Partnerships
Optum Labs

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Senior Vice President
Analytic Innovations
UnitedHealth Group
I have all this data...

Now what?
U.S. Health Care Perspective – $3.2T/18% of GDP

How can Big Data help solve these challenges?

The Employer Sponsored Health Plan

Am I relevant?
Big Data – What is it anyway?

1990’s
- Credit scoring – early bellweather as to how big data can impact insurance

2000’s
- Predictive modeling becomes mainstream
- Personal insurance: rating / price
- Commercial: underwriting, prospecting, etc.

Today+
- Health Insurance
- Risk and triage models
- Devices connectivity and real time data analysis

Original 3 V’s
- Velocity
- Variety
- Volume

Evolving to 6 V’s
- Veracity
- Visualization
- Value

Original 3 V’s
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Doug Laney, 2001
UnitedHealth Group Overview

Helping people live healthier lives

Helping make the health system work better for everyone

Foundational Competencies and Culture

Clinical Care Insight

Technology

Data and Information

Integrity • Compassion • Relationship • Innovation • Performance

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We accelerate research, innovation and translation by giving our partners access to the largest U.S. linked patient database, world class thought leaders and the power of multi-partner collaboration.

**Value proposition:**
- Drive change through Big Data analytics
- Improve outcomes
- Reduce healthcare spend
- Collaborate on health care’s biggest issues
OptumLabs: Our partners
Our Data Today: De-Identified & Linked

315 million U.S. population

- 1,500+ data fields:
  - Medical claims
  - Pharmacy claims
  - Lab claims and results
  - Health risk assessments
  - Standardized costs of care
  - Race
  - Income
  - Education level
  - Household
  - Geography
  - Mortality

- Tests, treatments

300+ additional data fields:
- Consumer behavior: general trends
- Demographic view including income, assets, home value, education level, marital status, occupation, home ownership, household make-up (multi-generational, presence of: children, grandchildren, grandparents), ethnicity data
- Psychographic data including interest and participation in: travel, various leisure activities, charitable giving, advocacy, volunteering, community involvement

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

>37 million consumers

>33 million people 20+ years

Claims (unlinkable)

EHR (linkable)

>47 million patients 3 to 7+ years

>131 million people 20+ years

Claims (linkable)
$1.6 Trillion in spend, 1993-2014 (normalized)
Pathways to Chronic Renal Failure
Big(ger) Data… Tackling Bigger Challenges

• “Constellations” - Collaborative multi-year, multi-partner, multi-project research, innovation and translation efforts to address
  – Heart Failure
  – Alzheimer’s Disease
  – Cancer
  – Spine Related Disorders
  – Methods
  – Patient Safety
  – Pharma Value

• Performance Measure Incubator and Accelerator
HF Clusters: Top 10% @ Risk for IP Admission*

*For illustration purposes only, diagram not to scale
Big Data Research Initiative to Fight Alzheimer’s Disease

- Early prediction
- Staging and progression
- Patient registry
- Care planning

Data scientists
Machine learning
Life sciences

Government and thought leaders
OptumLabs partner network
OptumLabs data
Optum CommunityHealth
Communities where your employees live can influence your outcomes

Social Determinants
- Community Engagement
- Health Literacy
- Individual Engagement
- Addictive Behavior
- Healthy Communities
- Insurance
- Obesity

Community Outcomes
- Life Expectancy
- Well Being
- Avoidable Utilization
- Care Match Patient Goals
- Evidence Based Care
- Preventive Services

Health System Attributes
- HIT Adoption
- Integration
- Payment Incentives
- Care Access

Employer Outcomes
- Covered PMPM
- Claim risk score
- ER visits per 1000
- Nurse engagement
  ... etc.
A Large National Employer Example

Optum CommunityHealth can help understand employee outcomes

In this example, Social Determinants for each location are compared to a national average.

Chicago has 878 members and some of the lowest social determinant scores observed nationally.
Social Determinants include Community Engagement, Health Literacy, Individual Engagement, Healthy Communities, Insurance and Obesity.

ER Visits for this employer may be impacted by the poor Social Determinants observed in Chicago.

NOTE: All Employer-specific data is illustrative only.
Chicago, IL

Individual Engagement appears to be a real challenge in Chicago.

<table>
<thead>
<tr>
<th>Membership</th>
<th>Sites</th>
<th>ER Visits Per 1000</th>
<th>Social Determinants</th>
<th>Community Engagement</th>
<th>Health Literacy</th>
<th>Individual Engagement</th>
<th>Addictive Behavior</th>
<th>Healthy Communities</th>
<th>Insurance</th>
<th>Obesity</th>
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<tbody>
<tr>
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<td>942 Melrose Park, IL</td>
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</tbody>
</table>

**NOTE:** All Employer-specific data is illustrative only.

Individual Engagement, Health Literacy and Addictive Behavior and Healthy Communities are all lower in Chicago.
Chicago, IL
Specifically, Medication Adherence is a key challenge for the community

**Chicago, IL** | 878 members

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**EMPLOYER**

- Covered PMPM: $291.38
- Days per 1000: 179.1
- Claim risk score: 0.882
- Paid PMPM: $221.22
- Paid PMPM (C.C.): $76.97
- ER visits per 1000: 183.9
- Pharmacy paid PMPM: $25.98
- Plan cost share (net): 76.3%
- Nurse engagement: 1.2%
- Premium provider utilization: 31.6%
- Paid: $73.21M
- Contracted discounts: 52.3%

**COMMUNITY MEASURES**

**SOCIAL DETERMINANTS**

- Addictive Behavior
- Community Engagement
- Health Literacy
- Healthy Communities
- Individual Engagement
- Insurance
- Obesity

- Depression Medication Adherence: 0.56
- Asthma Medication Adherence: -0.79
- CAD Medication Adherence: -0.79
- Hyperlipidemia Medication Adherence: -1.20
- Hypertension Medication Adherence: -1.30
- Diabetes Medication Adherence: -1.81

**NATIONAL MEAN**

**Diabetes Medication Adherence** has the most room for improvement relative to a National Average

**NOTE:** All Employer-specific data is illustrative only.
Lincoln, NE
Unlike Chicago, Lincoln has high Individual Engagement

Note: All Employer-specific data is illustrative only.

Medical Adherence in Lincoln is very good compared to the national average.
Health System Attributes, which include HIT Adoption, Integration, Payment Incentives and Care Access, are worse in Lincoln than they are nationally. 

NOTE: All Employer-specific data is illustrative only.
Lincoln, NE
Limited Healthcare Technology adoption may be increasing costs

Lower adoption of Healthcare Information Technology (HIT) may be increasing costs in Lincoln... particularly the % of Hospitals with EMRs

NOTE: All Employer-specific data is illustrative only
How do we make Big Data Useful for the various stakeholders?
How do we make Big Data Useful for the various stakeholders?

**Plan Sponsor**
Help me manage the health and productivity of my population.

**Individual**
Help me access and navigate the system and make better choices.

**Providers**
Help me manage the health and risk of my attributed population.

**Policy / Research**
Help inform innovation and regulations to ensure favorable market conditions for health plans.

Small & Purposeful Data for each player
Good Personal Choices exceeds the collective Power of Heredity, Medical Innovation, and our Gadgets

- **C+** Medication Adherence
- **52%** Diabetes/PreDiabetes by 2020
- **43%** Sub-optimal Decisions
- **1/5** Adult Mental Illness/Year
- **88%** Lack Health Literacy
- **18%** Adult Smokers

People still have to make a **Choice** (Culture).
## Design Means Architecting for Better Choices

**UnitedHealthcare Large Employer 2015 – Opportunity Remains**

<table>
<thead>
<tr>
<th>Benefits and Cost Share</th>
<th>Initiator</th>
<th>Awareness</th>
<th>Accountability</th>
<th>Ownership</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDHP = 47%</td>
<td>High</td>
<td></td>
<td></td>
<td>High</td>
</tr>
<tr>
<td>Richness = 83%</td>
<td>High</td>
<td></td>
<td></td>
<td>High</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Network and Transparency</th>
<th>Initiator</th>
<th>Awareness</th>
<th>Accountability</th>
<th>Ownership</th>
</tr>
</thead>
<tbody>
<tr>
<td>OON Differentials (all) / Narrowing (few)</td>
<td>High</td>
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<td></td>
<td>High</td>
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<tr>
<td>COEs (most) / Tiered Benefits (few)</td>
<td>High</td>
<td></td>
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<td>High</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Clinical and Well-Being</th>
<th>Initiator</th>
<th>Awareness</th>
<th>Accountability</th>
<th>Ownership</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinical (all) and Population Health (few)</td>
<td>High</td>
<td></td>
<td></td>
<td>High</td>
</tr>
<tr>
<td>Rewards (72%, $550) / Outcomes (few)</td>
<td>High</td>
<td></td>
<td></td>
<td>High</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Experience and Culture</th>
<th>Initiator</th>
<th>Awareness</th>
<th>Accountability</th>
<th>Ownership</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enrollment / Communications</td>
<td>High</td>
<td></td>
<td></td>
<td>High</td>
</tr>
<tr>
<td>Health Culture / ‘C’ Suite Emphasis</td>
<td>High</td>
<td></td>
<td></td>
<td>High</td>
</tr>
</tbody>
</table>
Modernization Value – 24% Lower Costs

INITIATION → AWARENESS → ACCOUNTABILITY → OWNERSHIP

So Far …  More to Achieve …

$9,310
Annual cost per year/per person
Low Initiation

- No clinical programs; low RX integration
- Richness >90%; no CDHP
- Passive PPO/Minimal INN vs OON benefit differential; some COEs
- No rewards strategy

N=30 Clients, (10th pctile), 477k members

$7,080
Annual cost per year/per person
Early Accountability

- Clinical suite of programs; Rx integrated 70% of the time
- Richness average of 77%; CDHP average of 68%
- Network almost all have COEs
- Consequential incentives

N=30 Clients, (90th pctile), 1.3 million members

*Annual Net Per Employee Per Year Costs – 2012 experience: after cost share and adjusted for demos, geo mix and high cost claimants. 24% cost attributed to 12% for covered decrease and 12% for richness.
The Challenge of Health – Avoid/Slow Illness
Burden from Metabolic Conditions

Sample client of 83,000 adults.

- Adults by state of health risk
  -- Average cost per year
  (from $2k to $24,000)

$24,000 and 9-25 lost workdays

2012 baseline results for 83,000 continuously enrolled adults from 2011. Estimated progressing adults are based on UnitedHealthcare book of business conversion rate studies applied to client population. Costs are shown for both those who were already in the risk level vs those who are progressing in the year.
Each year, unabated, 5-8% of the population advances to a higher state of health risk. 2012 baseline results for 83,000 continuously enrolled adults from 2011. Estimated progressing adults are based on UnitedHealthcare book of business conversion rate studies applied to client population. Costs are shown for both those who were already in the risk level vs those who are progressing in the year.

Sample client of 83,000 adults.

- Adults by state of health risk
  - Average cost per year
    - (from $2k to $24,000)

6,634 adults who advance in risk at a cost of $35M (6.8%) in year 1

$2,300,000 Total cost

2012 baseline results for 83,000 continuously enrolled adults from 2011. Estimated progressing adults are based on UnitedHealthcare book of business conversion rate studies applied to client population. Costs are shown for both those who were already in the risk level vs those who are progressing in the year.
The Challenge of Cost – Better Decisions

How optimal are people’s health care decisions?
1% point increase leads to 0.25%+ medical cost savings

Key Decisions
- Network choices
- Transparency
- Financial (HSA) Compliance
- Preventive / Wellness Program Engagement

% of Individuals

- Poor Decisions Makers
  - 13% at 0% CAI
- Influential Middle
  - 57% average
- Good Decision Makers
  - 8-15%
  - Lower costs

Decision Performance
Value of Health Ownership: Score of B+ will do

$271,400 Value at age 65

- 401(k) Base: $662,200
- Rewards & Avoided Surcharges: $66,000
- Avoidance of Costs / Disease pre and post 65: $73,400
- 401(k) New: $933,600
Case Study – Financial Services

2013 – 43% Engagement (Year 1)

Total reward of $500, of which HA+screening $200,
Deadline of April 30 to qualify; Account deposit

Total Spend
UHC population $794M

Engagement 43%
CAI 64%

BEST PERFORMER 95th Percentile

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15 Divisions (sub groups)
By Business Segments
By Payroll Tiers
2014 – 63% Engagement (Year 2)
Total reward of $1,000 (removed account default funding), of which HA+screening $600, rolling qualification (2013 - Feb 2014)
Case Study: client trend outperformed UHC HSA Norm leading to $156M accumulated savings

- 2015 Client Per member costs are **6.7% favorable** to HSA peer group ($53M run rate savings)

- Relative to Custom peer group, Client costs are **9.5% favorable** ($75M run rate savings).

Norm relativity measured on covered costs, ie. removes the effect of plan richness.

Average UHC Client members of 237k.

<table>
<thead>
<tr>
<th>Year</th>
<th>Client Trend</th>
<th>HSA Norm Trend</th>
<th>Cost Per Member Per Year</th>
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</thead>
<tbody>
<tr>
<td>2011</td>
<td>-10.1%</td>
<td>-8.3%</td>
<td>$3,484</td>
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<tr>
<td>2012</td>
<td>7.9%</td>
<td>9.9%</td>
<td>$3,132</td>
</tr>
<tr>
<td>2013</td>
<td>3.8%</td>
<td>4.0%</td>
<td>$3,379</td>
</tr>
<tr>
<td>2014</td>
<td>5.3%</td>
<td>5.8%</td>
<td>$3,508</td>
</tr>
<tr>
<td>2015</td>
<td><strong>5.3%</strong></td>
<td><strong>5.8%</strong></td>
<td><strong>$3,694</strong></td>
</tr>
</tbody>
</table>

4-Year Trend of 1.5% vs. Full Replacement HSA Norm of 3.2%

- HSA Norm Trend reflects observed performance for UHC National Accounts for full replacement HSA plans in years 1 and 2 (relative to a year 0 where PPO type plans were in place.
- Norm is adjusted to reflect specific demographic and plan richness changes of Client, Client’s catastrophic above norm trend ($100k). Macro trend of 6% is used prior to Client specific normalization items. Macro trend is sloped to reflect +/- norm experience for activation and rush/hush utilization behavior.
Default to the ‘Best’.

The Health Plan Supporting Health as a Human Experience


from wandering to a purposeful health journey
How can your data help us change Medicaid trends?
First, we identified several areas of significant cost.

5 percent of Medicaid enrollees had visited ER for a cold.

St. Mary’s county had the highest prevalence.

And one locality and hospital accounted for most visits.
As a result of our targeted analytics, stakeholders are collaborating to reduce ER utilization, improve outcomes and control costs.
Let’s use data to better serve New York Medicaid populations needing extra health support.
Using Health Plan Manager, we found hot spots of disease, high ER use and cost.

In Far Rockaway Queens, 20% of adults with Medicaid have diabetes.

In Brooklyn, 11% of children with Medicaid have asthma.
As a result, the United Way can target programs by neighborhood, the State of NY benefits from innovative grassroots collaboration, and we build stronger partnerships to affect change.
Driving results through individual health ownership

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