Using Population Identification Strategies to Tailor Care for Individuals with Complex Needs

May 17, 2021, 12:30-2 pm ET

Made possible with support from the Seven Foundation Collaborative —Arnold Ventures, The Commonwealth Fund, The John A. Hartford Foundation, the Milbank Memorial Fund, Peterson Center on Healthcare, the Robert Wood Johnson Foundation, and The SCAN Foundation.
Questions?

To submit a question, click the Q&A icon located at the bottom of the screen.
Welcome & Introductions
About the Better Care Playbook

Robust online resource center offering the latest knowledge on evidence-based and promising practices for people with complex health and social needs

Provides practical how-to guidance to inform health system leaders, payers, policymakers and others on strategies to improve care for high-need, high-cost populations

Coordinated by the Center for Health Care Strategies through support from seven leading national health care foundations — Arnold Ventures, The Commonwealth Fund, The John A. Hartford Foundation, the Milbank Memorial Fund, Peterson Center on Healthcare, the Robert Wood Johnson Foundation, and The SCAN Foundation.

www.BetterCarePlaybook.org
Welcome and Introductions

Kaiser Permanente: Using Population Identification Methods to Inform Complex Care Management

New York City Health + Hospitals: Employing a System-Wide Tool to Identify and Treat Patients with Complex Needs

CareOregon: Leveraging Data Analytics to Predict Rising Risk Populations within a Managed Care Plan

Moderated Q&A
Today’s Presenters

Rachel Davis, MPA
Director, Complex Care, Center for Health Care Strategies

Michelle Wong, MPH, MPP
Director, Care Management Institute, Kaiser Permanente

Jillian Diuguid-Gerber, MD
Lead Physician, Woodhull Hospital Primary Care Safety Net Clinic, New York City Health + Hospitals

Anna Davis, PhD
Research Scientist-Investigator, Center for Effectiveness and Safety Research, Kaiser Permanente

Anne Marie Young, MBA
Director of Complex Care, New York City Health + Hospitals

Jonathan K. Weedman, LPC, CCTP
Vice President, Population Health, CareOregon
Significance of Population Identification in Complex Care

- Individuals with complex health and social needs are a heterogeneous population.

- The effectiveness of specific complex care interventions depends on whether they engage the people who will most benefit from them. A “one size fits all” approach won’t work for everyone.

- Many complex care interventions have identified populations based on by cost/utilization measures, medical diagnoses, and/or insurance status- there is a lot more under the surface!

- Better understanding the population supports more targeted and tailored interventions.
Using Population Identification Methods to Inform Complex Care Management

Anna Davis, PhD, MPH
Research Scientist, Kaiser Permanente Center for Effectiveness and Safety Research
Instructor, Kaiser Permanente Bernard J Tyson School of Medicine

Michelle Wong, MPH, MPP
Director, Care Management Institute

May 17, 2021
The CORAL Research Program: Complex Care Collaboration: Operations, Research and Leadership

• Goal: Pair KP research investigators with operational leaders to generate actionable evidence to improve Complex Needs care.
• Administrative Lead: Elizabeth Bayliss, MD, MSPH
• Sponsor: Garfield Memorial Fund
• Four projects were funded in 2018; a second set of funded projects was launched in 2020

Today’s talk focuses on two CORAL studies:

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<th>Operationalizing a Taxonomy of Populations with Complex Needs</th>
<th>PIs: Anna Davis &amp; Michael Gould</th>
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<td>Meaningful Outcomes &amp; Missed Opportunities</td>
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Operationalizing a Taxonomy of Populations with Complex Needs

Research Team

Anna C. Davis, PhD, MPH -- Co-PI
Michael K. Gould, MD, MS -- Co-PI
John Chen, MD -- Clinical Champion
Thearis Osuji, MPH -- Research Project Manager
Aiyu Chen, MPH -- Research Data Analyst

Sponsor: Garfield Memorial Fund
Project Overview

• This study explored the many ways in which complex populations have been conceptualized and operationalized

• Our goal was to provide insights to support informed population selection decisions for complex care interventions

• Rationale:
  ▪ In practice, complex care programs generally use a set of criteria to select eligible patients, based on characteristics such as prior costs, prior utilization, or clinical conditions
  ▪ Selection of a target population is central to intervention planning
  ▪ Little consistency in how cohorts of patients with complex needs are defined or described
Two Stages of Work

Aim 1
Catalogue approaches to conceptualizing and operationalizing complex population definitions using pragmatic review of the literature and key informant interviews

Aim 2
Leverage available data to explore the implications of using different approaches for identifying patients with complex needs
Question:
How varied are the approaches being used to define populations with complex needs?

Methods:
• Pragmatic review of the literature via PubMed and key informant interviews
• Data abstraction to capture specific criteria used for defining the study populations
• Thematic analysis guided by a deductive coding process and data displays
Deriving a Typology of Criteria

STRATIFICATION
Separate according to risk level

SEGMENTATION
Drive toward homogeneous clusters

TARGETING
Match people & services

Domains
- Cost
- Utilization
- Age
- Income
- Health Conditions
- Subjective Criteria

Sub-Domains

Detailed Criteria

Common Themes

Most studies employed a combination of criteria across several domains to structure their complex population

- 75 of the 90 complex population definitions (83.3%) included a cost-based criterion, a utilization-based criterion, or both
- 35 of 90 complex population definitions (38.9%) included a health conditions-based criterion
- 19% - 20% of these population definitions also included a subjective component (e.g., referral or screening of the candidate patient list)

Variation in Criteria Specifications

Even within the common conceptualizations of complexity, we observed an array of distinct criteria specifications

- **4+ treat and release emergency department visits in the prior year**
- **1+ inpatient stay in the prior year**
- **2+ emergency department visits in the prior 28 days**
- **3+ emergency department visits or inpatient stays in the prior year**
- **Predicted inpatient readmission risk score of ≥50 out of 100 within the next year**

Concept of “frequent acute care utilizer”

Conclusions

• “Schools of thought” in population identification methods were unsurprising
• Variability in details of criteria specifications
• Very little information is available about how important such distinctions in criteria specifications are
• Vague language (e.g., “high utilizers”) creates potential confusion about comparability of seemingly similar cohort definitions
• Better understanding the implications of population selection decisions is critical to interpreting and comparing results of interventions

Full text available from Population Health Management: http://doi.org/10.1089/pop.2020.0153
“Schools of thought” likely reflect the specific priorities of individuals in the complex care community. Even within similar conceptual understandings, specific criteria used to define population inclusion are inconsistent. Very little information is available about how important distinctions in criteria specifications such as these are. Language used to describe groups of complex patients can be vague, leading to confusion about comparability of seemingly similar cohort definitions. Better understanding the implications of population selection decisions is critical to interpreting and comparing results of interventions.

Meaningful Outcomes & Missed Opportunities

Research Team
Richard W. Grant, MD, MPH -- Co-PI
James D. Ralston, MD, MPH -- Co-PI
Elizabeth A. Bayliss, MD, MSPH -- Co-PI

Sponsor: Garfield Memorial Fund
Question:
What distinct patient profiles can be identified within a population of the most medically complex patients?

Methods:
• 104,869 KPNC members with COPS > 14 and high ED or LOH
• Latent Class Analysis (LCA)
• 97 clinical variables from multiple domains (medication classes, procedures, lab results, utilization, SES, durable medical equipment)
Seven Patient Profiles Derived From Latent Class Analysis: Defining Features and Suggested Management Strategies

<table>
<thead>
<tr>
<th>Profile</th>
<th>Key defining features</th>
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<tbody>
<tr>
<td>Highest acuity</td>
<td>Patients with highest utilization (both inpatient and outpatient) with most comorbid conditions</td>
</tr>
<tr>
<td>Older patients with CVD</td>
<td>Older patients with high prevalence of CVD-related conditions and complications</td>
</tr>
<tr>
<td>Frail elderly</td>
<td>Oldest group with highest 1-y mortality and most frailty-related needs</td>
</tr>
<tr>
<td>Chronic pain management</td>
<td>High outpatient utilization and medical needs complicated by mental health needs</td>
</tr>
<tr>
<td>Active cancer treatment</td>
<td>Intensive oncologic therapy with associated medical and pain management issues</td>
</tr>
<tr>
<td>Psychiatric illness</td>
<td>Severe mental illness complicated by low income, social needs, and pain management</td>
</tr>
<tr>
<td>Less clinically engaged</td>
<td>Prevalent comorbidities but fewer visits</td>
</tr>
</tbody>
</table>

Conclusions

• Highly medically complex patient populations may be categorized into distinct patient profiles
• Patient clusters may be amenable to varying intervention strategies
• Although some group profiles were labeled by a key distinction, such as undergoing chemotherapy, every patient in each profile also had multiple other chronic conditions
• Care programs focused on supporting a single issue are not likely to fit the full range of needs in this medically complex patient population

Reflections
Kaiser Permanente’s Complex Needs initiative identifies health care delivery models that improve care for individuals who experience a combination of medical, functional, behavioral, and social needs.

This work:
• Builds bridges across system-level siloes between research, care delivery, and clinical decision makers
• Tests and evaluates patient-centered interventions and systems across Kaiser Permanente
• Partners with external organizations to advance the field and evidence-base for Complex Care
Kaiser Permanente Complex Needs Learning Approach

Health Plan and Medical Group Executive Sponsors

Local Operational Leaders

Complex Needs Research (CORAL)

Community of Practice

Define

Scan/Evidence

Disseminate

Test & Evaluate

Adjust

Evidence Reviews

Evaluation

Patients & Caregiver Ethnography

Operational Playbooks

CME and Workforce Training

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Thank you!

Contact: Anna.Davis@KP.org
Complex Care at NYC H+H

An Overview of our Operational Guide for Health Systems and Experience with Designing a Safety Net Clinic Program for Complex Care

CHCS Webinar
May 17, 2021
Jillian Diuguid-Gerber, MD, Lead Physician Safety Net Clinic Woodhull
Anne Marie Young, MBA, Director Complex Care
# Key Elements of Our Operational Guide

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<th>Identify</th>
<th>Risk scoring and stratification: using data and analytics to identify patients with complex needs</th>
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</thead>
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<td>Understand</td>
<td>Segmentation: combining analytics with clinical insight to understanding patients with complex needs</td>
</tr>
<tr>
<td>Treat</td>
<td>Targeting: tailoring care models to fit needs and behaviors of patients with complex needs</td>
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The **Complex Care Operational Guide** contains open-source implementation tools which can be customized and used to support health systems’ efforts to identify, understand, and treat patients with complex needs.
**Identify**  
Risk scoring and stratification: using data and analytics to identify patients with complex needs

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**H+H Selected Approach: Predictive Modeling**

Predictive modeling allows for proactive population risk scoring, which could be used to identify people who will generate the majority of costs or service utilization in the future or are at highest risk for poor health outcomes.

- NYC Health and Hospitals developed a payor-agnostic risk model for super-utilization using administrative and clinical data. This did not require advanced EHR functionality or proprietary claim-based rules, making it timely and affordable for our system.

- Access H+H’s nonproprietary, open source predictive model here: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5910357/
Example: Early Data Driven Segmentation at H+H

1) Action Segments were based on eligibility criteria for existing care management programs, matched to EHR data on conditions.
   - Action Segments included serious mental illness, high ED utilizer, high IP utilizer, and homeless.

2) Financial data helped us understand generally where high risk people were seeking services (Emergency Department, Inpatient, and Primary Care)
### Understand

**Segmentation:** combining analytics with clinical insight to understanding patients with complex needs

### Tool: Qualitative Segmentation

<table>
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<th>Capable, but conflicted</th>
<th>Struggling to self-manage</th>
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<tbody>
<tr>
<td><em>Mixed medical and behavioral health needs with acute utilization driven by recent life event</em></td>
<td><em>Primarily medical needs, with utilization driven by preference and perception</em></td>
<td><em>Mixed behavioral and medical health needs, compounded by limited ability to live independently</em></td>
</tr>
<tr>
<td>• Recent onset, illness exacerbation</td>
<td>• Primary care sensitive conditions</td>
<td>• Mixed BH and medical complexity</td>
</tr>
<tr>
<td>• Change in health, lifestyle, environment, social status</td>
<td>• “Avoidable” utilization</td>
<td>• Functional limitations, DME and skilled nursing needs</td>
</tr>
<tr>
<td>• High ED (psych, CD, and medical), low IP, some ambulatory</td>
<td>• Patient preference/beliefs/values not aligned with existing ambulatory care offerings</td>
<td>• High IP admissions, outpatient MH and geriatrics utilization, polypharmacy</td>
</tr>
<tr>
<td>• “Undertreated,” potentially undiagnosed</td>
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<table>
<thead>
<tr>
<th>Disconnected by disparity</th>
<th>Seeking relief from serious illness</th>
<th>Basic needs for better health</th>
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<tr>
<td>Mostly medical needs, potentially underlying SUD, with significant social risk as barrier to aftercare</td>
<td><em>High disease burden, mostly medical, but also serious, persistent mental illness, with limited insight into prognosis</em></td>
<td>Significant behavioral health, with some chronic medical conditions, but lacking basic resources to get well</td>
</tr>
<tr>
<td>• Appropriate ED/IP utilization</td>
<td>• Advancing illnesses, palliative care needs for symptom management</td>
<td>• Lacking basic fundamentals: housing, social support, food security</td>
</tr>
<tr>
<td>• Unable to follow-up with aftercare</td>
<td>• High IP admissions, ED visits, and specialty</td>
<td>• Health outcomes limited by resources</td>
</tr>
<tr>
<td>• Social risk (uninsured, undocumented)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Conditions worsen, result in readmissions and revisits in ED</td>
<td></td>
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</table>
**Treat** | **Targeting**: tailoring care models to fit needs and behaviors of patients with complex needs

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**Model Domains:**
- Enhanced Medical Home
- Home and Community Models
- Transitional Care Models

**Matching Models to Segments: Intensive Primary Care**

- **Critical point in time**
  - Mixed medical and behavioral health needs with acute utilization driven by recent life event

- **Capable, but conflicted**
  - Primarily medical needs, with utilization driven by preference and perception

- **Struggling to self-manage**
  - Mixed behavioral and medical health needs, compounded by limited ability to live independently

- **Disconnected by disparity**
  - Mostly medical needs, potentially underlying SUD, with significant social risk as barrier to aftercare

- **Seeking relief from serious illness**
  - High disease burden, mostly medical, but also serious, persistent mental illness, with limited insight into prognosis

- **Basic needs for better health**
  - Significant behavioral health, with some chronic medical conditions, but lacking basic resources to get well

*Source: New York City Health + Hospitals Provider Focus Groups, September 2018-November 2018.*
NYC H+H Complex Care Pilot: Designing the Primary Care Safety Net Clinic, An Intensive Primary Care Model

Clinic Mission:

1. To effectively engage homeless patients with complex barriers to primary care.
2. To provide dignified, trauma-informed care focused on patient-oriented care goals while addressing addiction, mental health, and chronic disease.
3. To implement an interdisciplinary care team model in a safety-net health care system combining primary care, social work, care coordination, and nursing.
Staffing Model for Safety Net Clinic Pilot

Hospital-Based Staff

- Primary Care Provider
- Clinic Nurse
- Patient Care Associate
- Front Desk

Support Staff via Partnerships

- Care Coordinators
- Housing Navigator
- Social Worker

= 1 Full Time Equivalent (FTE)
Tips: Replicating a Pilot Program for Patients with Complex Needs

- Conduct a needs assessment to determine what subpopulations may not have existing resources or lack sufficient resources within the health system or community.

- Identify existing resources (space, staffing) that may be underutilized or in the process of being phased out.

- Start small and iterate based on experience, patient feedback, and provider feedback.

- Target outreach to external organizations with shared mission or population focus; prioritize internal stakeholder outreach (just as important!)
CareOregon: Leveraging Data Analytics to Predict Rising Risk Populations

Jonathan Weedman, LPC, CCTP
Vice President, Population Health
For more than 25 years, CareOregon has offered health services and community benefit programs to Oregon Health Plan members. Today, we support the needs of 450,000 Oregonians through three coordinated care organizations, a Medicare Advantage plan, a Tribal Care Coordination program, a dental care organization, and in-home medical care with Housecall Providers. CareOregon members have access to integrated physical, dental and mental health care, and substance use treatment. We believe that good health requires more than clinics and hospitals, so we also connect members to housing, fresh food, education and transportation services. CareOregon is a mission-driven, community non-profit with offices in Portland, Medford and Seaside, Oregon.
CareOregon’s Mission

*Why we exist*

Inspire and partner to create quality and equity in individual community health.

CareOregon’s Vision

*Where we are going*

Healthy communities for all individuals, regardless of income or social circumstances.
Population Segmentation

Rising Risk
A Brief History

Collective Medical-Stayer, Joiner, leaver
Marrying the right intervention with the right population
Using data to guide our process
Historical State

- Acute episode identified members for care coordination
- Interventions were reactive to ED visit or IP hospitalization
- Criteria-based programming (x ED visits in x time) rather than proactive identification
Identifying members prior to acute episodes (IP hospitalization, ED, etc.)

Proactively outreach to members likely needing more attention (yours, mine and ours)

Use data to identify the physical, social and behavioral health needs of members and how they contribute to the health decline process

Successfully disrupt or delay the process of health decline
Current Model - Pop Seg 1.0
What is Segmentation?

Process of putting people into groups based on *similarities*

Commonly used in marketing
Why Segment?

• Understanding our population based on specific patterns/behaviors/needs
• Inform resource allocation to address those specific needs
• Observe population level trends over time (are members collectively getting more healthy, more sick, etc.)
• Identify member-level trends by provider/clinic to inform opportunities for quality improvement and support
How Segmentation Works

That’s only 0.5% of our population!!!
What about the remaining 99.5% of our population?
Segmentation – Model Development

Data Sources
- Medical Claims
- Pharmacy Claims
- ACG

Input Variables
- Age
- ED Visits
- Pharmacy Cost
- Hospital Dominant Count
- Major ADG Count
- Active Ingredient Count
- Inpatient Admissions
- Outpatient Other Visits
- + Other derived variables
- Chronic Condition Count
- Diagnoses Used
- Total Providers Seen

Algorithm Output
- Cluster Analysis

Human assigned Labels
Segments

- Healthy Kids
- Healthy Adults
- Acute Kids & Adults
- Moms & Babies
- Chronic Managed
- Complex Managed
- High Rx
- SA/SMI/Chronic
- Uncoordinated
- Chronic Uncoordinated
- Extremely Complex

Total CareOregon Population

- Utilization patterns of members/patients
- Provides framework for how we can communicate and match the correct intervention with the need
Understanding Segments: Rising Risk

**Chronic Managed**

- At least 4 chronic conditions, 20% have severe mental health issues, have one hospital dominant condition, prevalent conditions are diabetes, hypertension, low back pain, and asthma

- Engagement with PCP/Specialists and OP care, no significant ED/IP use

- 1) Member may need to connect with BH specialist at clinic and/or need referral to specialty MH
   2) Make sure member’s conditions/medications are reviewed

**Complex Managed**

- Has multiple medical conditions

- Have high engagement with PCP/Specialists (on average 30+ OP visits), few IP/ED visits

- 1) Clinic does review of patient on a regular cadence to ensure medical issues are addressed

- Highest rate of specialist visits than any other segment

- Highest prevalence of Cancer & Rheumatoid Arthritis compared to other segments
Understanding Segments: Rising Risk

**Uncoordinated**
- Mostly in their 30’s with no chronic conditions, 30%-40% have SUD and half use tobacco.
- On average has 5+ ED visits, less likely to engage with PCP

1) Connect member to SUD treatment and/or PCP
2) Connection to community resources that are age appropriate

**Chronic Uncoordinated**
- Has at least 4 chronic conditions and 2 hospital dominant conditions, and on average takes medications with over 20 ingredients
- Has had at least one unplanned IP stay, a couple ED Visits

50% of members in Chronic Uncoordinated segment are frail & 50% of them also use Ambulance (~n=1,800)

1) Focus on IP transitions to ensure member has f/u appointment with PCP and med rec happens
2) Clinic focuses on medications and makes sure member’s meds are correct and being taken
3) Ensure member is attending appointments and has support as needed to make sure they get needs met
Application Concept
High Risk: Extremely Complex

Rising Risk: Chronic Uncoordinated

**Rising Risk: Chronic Managed**

Rising Risk: Complex Managed

Rising Risk: Uncoordinated

What are we Trying to Accomplish?

What are we Trying to Accomplish?

Current State: Reactive, event occurs (i.e., ED visit, IP stay) triggers response – which is appropriate for some subpopulations
What are we Trying to Accomplish?

What are the meaningful signals indicating a change in health is beginning (Proactive)

Possible Signals:
- DME
- Medication
- New DX
- MH tx
- SUD tx
- Predictive Analytics

Long-term limitations with intermittent serious episodes

Mostly heart and lung failure

Death
What are we Trying to Accomplish?

What are the meaningful signals that an end of life cycle has begun?

Possible Signals:
- 1st ICU
- Change in Frailty Status
- DME
- Lab Change
- End of Life Indexes
What are we Trying to Accomplish?

Clinical Strategy that is: data driven, covers disease state life-cycle and is truly right care at the right time.
Lessons Learned

Finding the right “signals” is challenging

Current model isn’t predictive

Need to develop a lens into member impactability

Language is important—simplified for providers and trauma informed for members
Next Steps

- Readjust model to include predictive analytics (Pop Seg 2.0)
- Develop mechanism for indicating impactability
- Test with clinic and community partner(s)
- Create clear road map of “Yours, Mine, and Ours”
- Work collaboratively with network to build workflows for road map
- Develop evaluation to determine true changes to risk status
Question & Answer
Questions?

To submit a question, click the Q&A icon located at the bottom of the screen.
Linked Resources

- **Kaiser Permanente**
  - Identifying Populations with Complex Needs: Variation in Approaches Used to Select Complex Patient Populations
  - Use of Latent Class Analysis and k-Means Clustering to Identify Complex Patient Profiles
- **NYC H+H**: Operational Guide to Identify, Understand, and Treat High-Need Patients
- **CareOregon**: Identifying “Rising Risk” Populations: Early Lessons from the Complex Care Innovation Lab
Share Your Successes on the Playbook

- Have you established a promising practice?
- Published a study about your complex care program?

The Playbook welcomes content submissions to help spread best practices in complex care.

www.BetterCarePlaybook.org
Thank you!

Please submit your evaluation survey.