Health Equity from an Actuarial Perspective
Managing Population Health

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About the Academy

• The American Academy of Actuaries is a 19,500-member professional association whose mission is to serve the public and the U.S. actuarial profession. For more than 50 years, the Academy has assisted public policymakers on all levels by providing leadership, objective expertise, and actuarial advice on risk and financial security issues.

• The Academy also sets qualification, practice, and professionalism standards for actuaries in the United States.

For more information, please visit:

www.actuary.org
Why actuaries care about health equity

• Key health decision-makers rely on actuaries for advice
• Unique skillset to quantify costs of health disparities to the health care system
• Commitment to identifying and addressing issues on behalf of the public interest
• Desire to explore and understand whether any actuarial practices inadvertently lead to or exacerbate health disparities and inefficient use of health care dollars
• Potential to use actuarial principles to reduce health disparities and improve health outcomes
American Academy of Actuaries
Health Equity Committee

• Created to contribute actuarial perspective to health equity

• Focus:
  ➢ Evaluate actuarial practices in the context of health equity
  ➢ Educate actuaries and other stakeholders on health equity issues
  ➢ Apply an equity lens when considering the impact of current or proposed health care policies
Definitions used by the Health Equity Committee

Health Equity: Everyone has a fair and just opportunity to be as healthy as possible. This requires removing obstacles to health such as poverty, discrimination, and their consequences, including powerlessness and lack of access to good jobs with fair pay, quality education and housing, safe environments, and health care.

Health Disparities: Differences in health or its key determinants that adversely affect marginalized or excluded groups. Disparities in health and in the key determinants of health are the metric for assessing progress toward health equity.

Social Determinants of Health: Nonmedical factors such as employment, income, housing, transportation, child care, education, discrimination, and the quality of the places where people live, work, learn, and play, which influence health.

Initial phase—Discussion brief developed a list of questions and topics to explore further

- Comprehensive list served as starting point for further analysis
- Four areas of focus:
  - Health plan pricing
  - Health plan benefit design
  - Provider contracting and network development
  - Population health management
Subsequent papers explored issues in more detail
Health equity and managing population health

In what ways can efforts to assess health risks and efforts to address these risks affect health disparities?

- one-year time horizon
- program assessment metrics
- wellness programs
- financial risk
- care management
- complex algorithms
- disease management
- social determinants of health
- specific populations
- choice of data
- return on investment
Population health definitions

- Population health: health outcomes of a defined group of individuals, including the distribution of such outcomes within the group
- Population health management: the processes used to improve health outcomes of a population
Actuarial considerations in managing population health

• Defining the population and determining outcome measures
• Interpreting large data sets
• Developing and managing complex algorithms
• Collaborating with cross-functional teams
• Measuring financial risk
• Conducting cost/benefit analyses
Algorithms and proxy data

• Used to identify individuals who are eligible for the intervention
  • Interventions may be wellness based or disease focused
• Claims data is generally used but does not necessarily reflect need
  • Can lead to bias by de-prioritizing individuals with lower claim cost even if they would benefit from the intervention
• Testing algorithms could identify racial, gender, or other types of bias (may require collecting demographic data)
Population Health Example: Diabetes Management Program

Historical Claims

\[ y = mx + b \]

Identifies population for program

DM Program

Unidentified Diabetic Population
No Historical Claims
Population Health: Diabetes Management Program (cont.)

Diabetes Prevalence by Race/Ethnicity

- non-Hispanic whites: 7.5%
- Asian Americans: 9.2%
- Hispanics: 12.5%
- non-Hispanic blacks: 11.7%
- American Indians/Alaskan Natives: 14.7%

Addressing Social Determinants of Health (SDOH)

• Predictive analytics and data mining can be used to identify individuals needing SDOH support
  • Can help overcome some limitations of claims data
• Interventions to improve health outcomes may not be directly related to healthcare, e.g.,:
  • Renovating public housing to address asthma
  • Building supermarket in a “food desert”
  • Investing in transportation services
• SDOH interventions may not be as easily implemented in the context of a health plan
• Legal/regulatory hurdles may impede the design of care management programs
• “One size fits all” may not work when designing solutions to address SDOH needs
Time horizon

- Cost/benefits of interventions are often measured over a one-year time horizon
  - Most insurance plans reset on an annual basis and members/employees may turnover
- This short time horizon could undervalue benefits that take longer to materialize
  - For populations with lower utilization, this may exacerbate real or perceived disparities
Measuring outcomes

• Return on Investment (ROI) is often used to make decisions about programs but it may focus too heavily on financial results

• Looking at average results over an entire population may not show the benefit for specific marginalized populations

• Including quality metrics, in addition to financial outcomes, may be a way to highlight and ultimately reduce health disparities
Using Risk Assessment to Target Disease Management and Care Management Programs

Goal:
To identify patients who would most benefit from these programs
Identifying Patients for Disease and Care Management Programs

• Eligible plan members can be identified through:
  • claims-based algorithms
  • risk stratification based on risk assessments of underlying conditions and whether outcomes can be improved through interventions

• If predicting costs is part of the identification process, could deprioritize members with lower costs, even if they have higher needs
  • Lower costs may indicate lower access to care rather than lower health care needs
Example of Algorithmic Bias

- Algorithm used to identify patients with complex care needs
- At a given risk score, Black patients are sicker than white patients
- Bias arises because algorithm predicts health costs rather than illness
- Authors estimate that eliminating the bias could nearly double the Black patients selected

https://www.science.org/doi/10.1126/science.aax2342
Options to Address Bias

• Rather than using health care costs, base algorithms on other predictors of need (e.g., avoidable costs, chronic conditions)
• Adjust spending data to better reflect health care needs
• Use constrained regressions
• Incorporate social risk factors when appropriate
Additional Resources

• Algorithmic Bias Playbook (Obermeyer, et al.)
  https://www.chicagobooth.edu/research/center-for-applied-artificial-intelligence/research/algorithmicbias
Area-Level Social Risk Measures

Goal:

• Help measure and understand how the social determinants of health at the community level affect health-related social needs at the individual level
Potential Uses of Area-Level Risk Measures

• Target funding for health-related social needs
• Adjust payments to health insurance plans
• Adjust payments to providers
• Incorporate into risk assessments
Selected Area-Level Indices

- Area Deprivation Index
- Social Vulnerability Index
- Social Deprivation Index
- AHRQ Socioeconomic Status Index
- Baseline Resilience Indicators for Communities
- California Healthy Places Index
- Census Bureau Community Resilience Estimates
- Child Opportunity Index 2.0
- Community Need Index
- Community Resilience Indicator Analysis
- COVID-19 Vaccine Coverage Index
- COVID-19 Community Vulnerability Index
- Distressed Communities Index
- Healthiest Communities
- Material Community Deprivation Index
- Modified Darden-Kamel Composite Socioeconomic Index
- Multidimensional Deprivation Index
- Multidimensional SDOH Index
- National Risk Index
- Neighborhood Concentrated Disadvantage Index
- Neighborhood Deprivation Index
- Neighborhood Socioeconomic Status
- Neighborhood Stress Score
- Opportunity Index
- Social Capital Index
- Social Vulnerability to Environmental Hazards Index
- Townsend Deprivation Index
- U.S. Prosperity Index
Indices Vary in Many Important Ways

• Domains included (e.g., socioeconomic position, race, gender, residential context, social needs)
• Specific indicators within domains
• How indicators are weighted
• Unit of analysis (e.g., census block group, census tract, ZIP code, county)
• Data source, update frequency, and most recent year available
• Availability; cost to access

When contemplating the use of an index, it’s important to understand how the index was developed and its appropriateness to the specific project and goal
Some Key Issues With Using Area-Level Measures

• The population represented in the index often differs from the population being risk adjusted.

• For many indices, the geographic unit of analysis is large enough that many cells won’t be homogeneous.
  • Variance of characteristics within a cell will affect appropriateness of applying the index at an individual level
Additional Resources

- Landscape of Area-Level Deprivation Measures and Other Approaches to Account for Social Risk and Social Determinants of Health in Health Care Payments (RAND/ASPE)  
  https://aspe.hhs.gov/reports/area-level-measures-account-sdoh

- Social Determinants of Health: A Review of Publicly Available Indices (Hinnant et al., RTI)  
  https://rtipress.scholasticahq.com/article/55734

- Assessment of Population-Level Disadvantage Indices to Inform Equitable Health Policy (Kaalund et al.)  

- Use of Area-Based Socioeconomic Deprivation Indices: A Scoping Review and Qualitative Analysis (Trinidad et al.)  
Academy Resources

• Health Equity from an Actuarial Perspective: Managing Population Health

• Health Risk Assessment and Risk Adjustment in the Context of Health Equity
Questions?
Thank You

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