ADVISORY COUNCIL

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The Past, Present and Future of Our Mortality Improvement Journey (MI+)

Johns Hopkins and Gen Re Collaboration

JOHNS HOPKINS BLOOMBERG SCHOOL of PUBLIC HEALTH

Vision – Objective – Partnerships

Lengthening insureds lifespans while improving KPIs
A win-win-win for all stakeholders

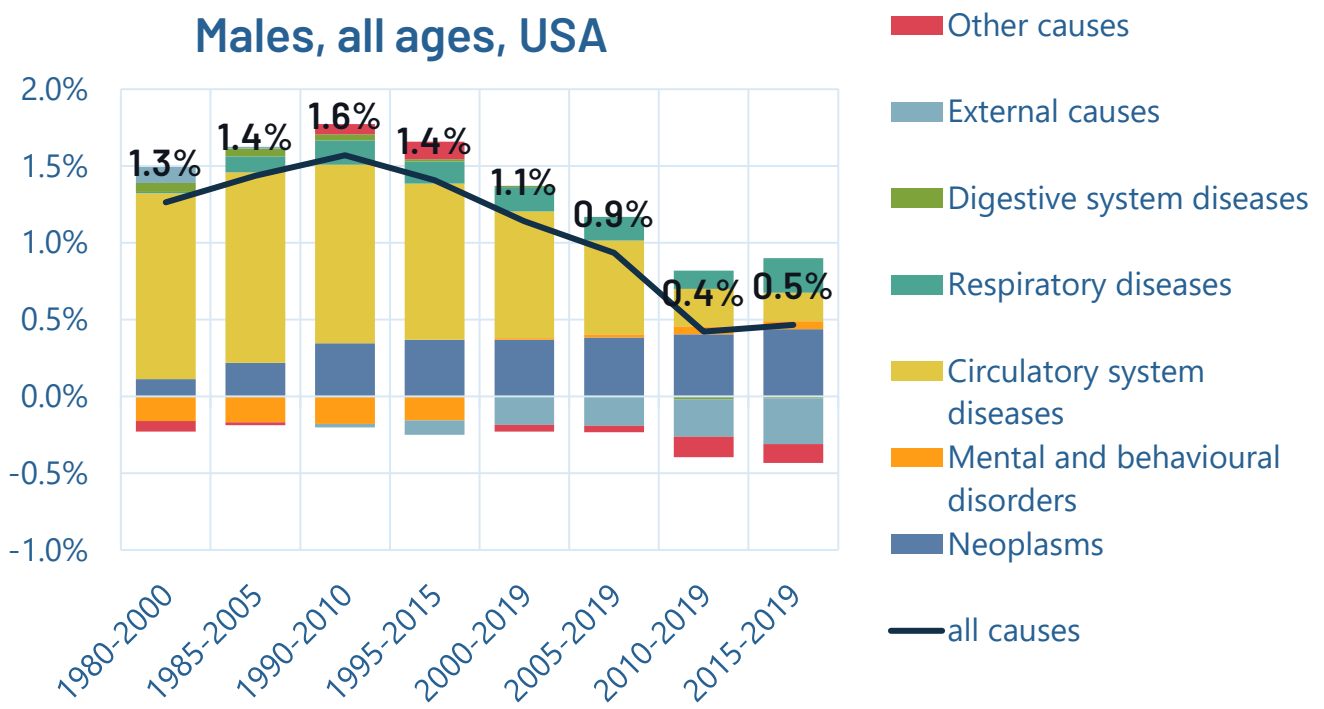
Reverse negative mortality trends through
active interventions and wellness promotion

Partnership with JHU to explore three key areas and develop a deeper understanding of MI

Industry Leading Mortality Improvement Trends Analysis

- Gen Re's examination of recent mortality trends versus historical mortality data show a slowdown in mortality improvement since 2011.
- Much of this is driven by significant decreases in mortality improvements for circulatory system diseases.
- These trends have continued to persist even after the pandemic.

Decomposition of Mortality Trends by Cause of Death



Source: Human Mortality Database

History of Behavioral Modification Efforts

2015-2019

- Improving wearable technology inspired a broad array of new health engagement tools designed for life insurance clients.
- Many insurance carriers attempted pilots, offering innovative health apps to inforce clients.
- Gen Re collaborated with Johns Hopkins and developed partnership with PAI health based on this research.

2020-2024

- COVID pandemic forced most carriers to focus innovation resources on new underwriting programs.
- Most inforce engagement pilots were paused or deferred.
- Many health engagement insurtechs folded or were bought out by bigger IT vendors.

2025 +

- Uptick in inforce engagement pilots as carriers explore ways to help clients live healthier.
- Health engagement ecosystem has started to rebound as carriers seek new tools to help inforce clients.

Gen Re – Behavioral Economics Research

Key Focus Areas

- Non-medical and medical condition disclosure
- Widely-used Interstate Compact questions
- "Live" applications; Accelerated Underwriting
- BE training and insights from Suffolk University

Gen Re – JHU Research Collaborative

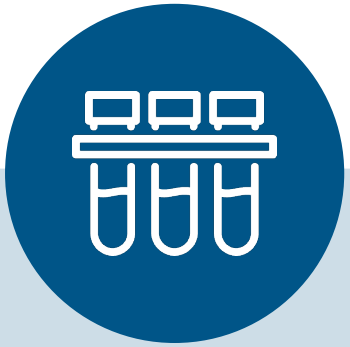
Clinical & Research experts at JHU to help identify promising new avenues

+

Synergistic Gen Re perspectives & skillsets

Leading to 3 Main Areas of Research Investigation

Gen Re – JHU Projects



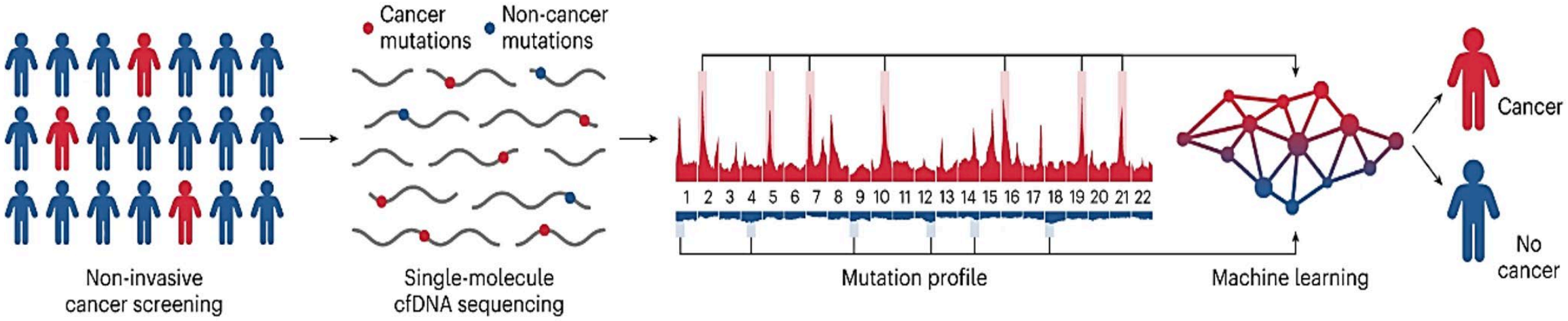
"Liquid biopsy"
to aid in the detection of
cancer disease

Cost Benefit Analysis of
U.S. Preventive Services
Task Force
recommendations

Effectiveness of
implementing
behavioral health tools to
decrease mortality

Liquid Biopsy MCED Tests

- Multi-Cancer Early Detection (MCED) tests are liquid biopsies that detect evidence of cancer
  - Blood tests that try to detect cancer DNA, sometimes augmented with protein biomarkers and AI modeling
- Galleri (GRAIL) is the only commercially available product
- CancerSEEK in development (Cancerguard, same vendor as Cologuard)



Source: Bruhm et al Nature Genetics 2023.

Galleri Evidence in PATHFINDER Study

- Study comprised 6,621 people age > 50 who had no current cancer symptoms.
  - Most were current on screening (colonoscopy, mammogram, etc.)
- Sensitivity = 29% with 122 total cancers discovered during the study period
  - Galleri detected 35 cancers
  - 87 others manifest clinically during study period
- Positive predictive value = 38%
  - Likelihood that positive result is true
  - 57 false positive with no cancer found on clinical investigation
  - Nearly twice as many false positive as true positive
- Number needed to screen: 189

Source: Blood-based tests for multicancer early detection (PATHFINDER): a prospective cohort study. Schrag, Deb et al. The Lancet, Volume 402, Issue 10409, 1251 - 1260

Cost-Benefit Analysis

Benefits

- With MCED tests, cancer can be detected earlier with a better chance of a successful outcome.
- Provides potential solution for certain cancers with no current screening test (e.g., Pancreas)
- Less invasive than some other screening tests.

Costs

- Financial Cost
  - Current retail price per test is roughly $1,000.
  - Translates to roughly $180K for each true positive cancer test
- Non-Financial Cost
  - Emotional impact on false positives with 162 days to complete clinical evaluation
  - 2% of false positives had surgical procedure

No evidence yet for longer life, but studies are ongoing.

Cost-Benefit Analysis of USPSTF Recommendations

- The USPSTF (US Preventive Services Task Force) is an independent panel that evaluates the efficacy of clinical services, providing recommendations graded from A to D based on the certainty and magnitude of health benefits.
- This study reviewed Grade A, B and C recommendations and looked to measure potential lifespan gain of high-impact recommendations.

Focused on grade A recommendations with high probability of substantial net benefit

Recommendations to Study:

- *Colorectal Cancer Screening ages 50-75 years*
- *Hypertension Screening in adult 18 or older*

What is the cost-benefit and cost-effectiveness?

USPSTF Recommendations Analysis

- Analysis of USPSTF recommendations revealed marginal positive impact on years of life saved for Gen Re in-force clients
- Investigation of colon cancer screening with colonoscopy had limited impact on the insured population, due to high current uptake
- Hypertension treatment showed promise due to incomplete treatment
- Improved physical activity appears to have the most significant positive impact

Meta-Analysis + Panel of Experts

Lawrence Appel, M.D., MPH
Professor
JHSOM, SPH

Jennifer Schrack, Ph.D., MS
Professor
JHU Bloomberg, SPH

Seth Martin, M.D.
Professor
JHSOM

Dale Bond, Ph.D.
Director of Research Integration; Co-Director, Center of Obesity Research, Innovation, and Education
Harford HealthCare

Gerald Jerome, Ph.D.
Professor
Towson University

Graham Thomas, Ph.D.
Professor
Brown Alpert Medical School

Key Health Targets from Epidemiologic Studies

1. Systolic Blood Pressure

0.5 mm difference = Mortality reduction in IHD=2%, Stroke=3%

2. BMI

0.3 decrease for BMI>25 = 2-3% reduction in CV & all-cause mortality

3. Activity Level

Lowest vs 2nd activity quartile (5 min/day of moderate/vigorous activity) = 20% reduced CV & all-cause mortality

Effective Tactics from Meta-Analysis & Panel

Education

- Focus on the why, what and how of each behavior change
- Combination of reading with direct instruction
- Education alone is not the solution

Goal setting & Self-Monitoring

- Goals must be SMART with regular review for accountability
- Monitoring can include mix of active (e.g. - weight or calorie tracking) and passive tools (e.g. - wearables)

Feedback

- Electronic reminders, notifications, text messages, emails, etc.
- Can be pre-programmed or personalized to individual goals
- Can have scheduled delivery vs just in time
- Interventionist/coach can encourage better compliance

Key Lessons Learned

Positive Impact Possible

Early data shows encouraging results across several dimensions:

- Improved mortality
- Improved persistency
- Positive selection bias.

No Silver Bullet

- Inforce engagement is a big task with no silver bullet.
- Inforce engagement is not a core competency of life insurers, so outreach requires new skills and partners.

No Half Measures

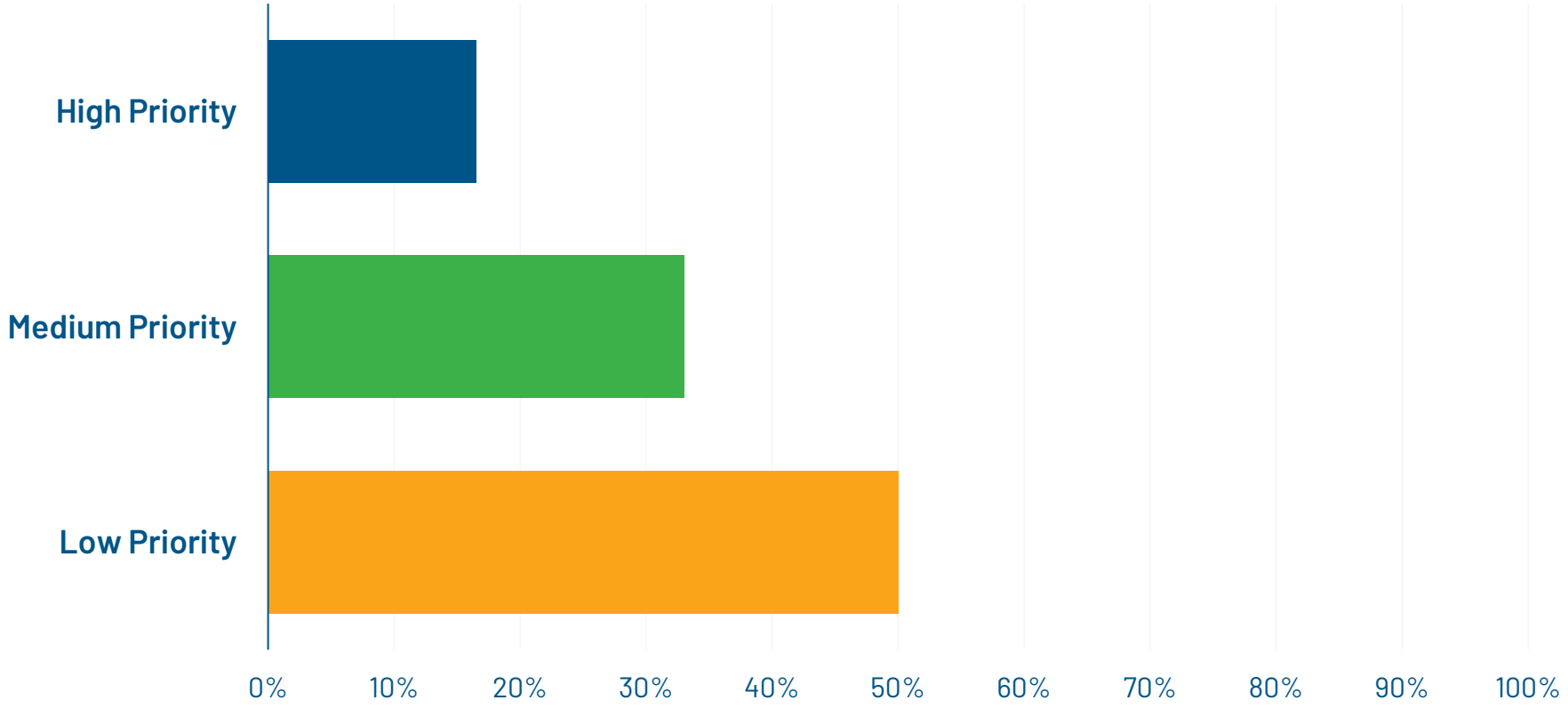
- Many pitfalls involved in DIY engagement approach.
- A robust inforce engagement investment is crucial to drive long-term impact.

BE Expertise

- Need an effective behavioral economics framework to guide successful implementation.

Where are you on your journey?

Where do health engagement programs for inforce policyholders align as a company priority?

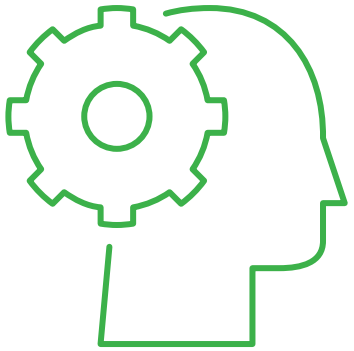


Note: Based on 12 responses.

Gen Re MI+ Toolkit

Gen Re's goal remains creation of an ever-evolving mortality improvement toolkit based on these findings that our clients can provide to their new business and in-force population

Solution Identification



Knowledge Sharing

Project Support

Gen Re MI+ Toolkit

Solution Identification

- Help you identify specific tools most likely to drive user engagement and behavior change
- We can provide recommendations on top engagement tool(s)
- Focus on tools that target the conditions that are best candidates for better mortality
- Principles driven by Gen Re and John Hopkins University knowledge and research.

GRAIL

sureify

sweetch

Vitality

Vastmindz

dacadoo

Optimity

Aktivo Labs

prenuvo

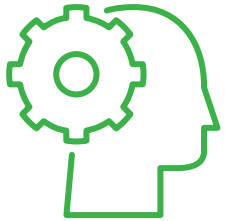
My Heart Counts

Heuro Health

Solution Assessment

- How well does the vendor address client requirements?
- Is the solution targeted to certain niches or more generalized?
- What is the pricing structure and estimated cost of implementation?
- What experience do they have in the insurance market?
- Is the underlying tech suitable?

Gen Re MI+ Toolkit



Knowledge Sharing

- Evaluate delivery platforms in the industry against our research findings
- Guidance on potential impact to post-issue engagement as well as mortality improvement

Project Support

- Potential cost sharing partnerships and implementation assistance on new initiatives
- Support to determine most cost-effective design of pilots
- Expert advice on key assumptions
- Potential risk sharing

Three Key Questions For Our Clients

What is the current priority within your firm?

Where are you on your journey?

How can we help?

MI+ Team – Making the Impossible … Possible

Dr. Chris Yiannias
Senior Medical Director

Donna Sivigny
Head of Individual Life

Frank Chechel
Head of Individual Life Underwriting

Dr. Thomas Ashley
Chief Medical Director

Aaron Nishimura
Head of Underwriting Solutions

Heidi Alpren
Senior Research Manager

Dr. Albert Wu
Professor of Health Policy & Management

Thank you!

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