Roundtable Panel Discussion: *Stakeholder Perspectives on a Pathway Toward Developing PB-TCOC Models*

Panelists:

Subject Matter Experts

- **Don Calcagno, Jr., MBA** – Senior Vice President, Chief Population Health Officer, Advocate Health, and President, Advocate Physician Partners at Advocate Health
- **Mark McClellan, MD, PhD** – Director & Professor, Business, Medicine, and Policy, Duke-Margolis Institute for Health Policy, Duke University
- **Palav Babaria, MD, MHS** – Chief Quality Officer and Deputy Director of Quality and Population Health Management, California Department of Health Care Services
- **Michael E. Chernew, PhD** – Professor, Health Care Policy, Director, Healthcare Markets and Regulation (HMR) Lab, Department of Health Care Policy, Harvard Medical School
- **Charlotte S. Yeh, MD, FACEP** – Founder, Yeh Innovation and Former Chief Medical Officer, AARP Services, Inc.

Roundtable Panel Discussion: Stakeholder Perspectives on a Pathway Toward Developing PB-TCOC Models

Don Calcagno, Jr., MBA

Senior Vice President, Chief Population Health Officer,
Advocate Health, and President,
Advocate Physician Partners at Advocate Health

Don Calcagno

SVP, Chief Population Health Officer | Advocate Health
President | Advocate Physician Partners

13K+
Participating Physicians

15
ACOs | CINs | Networks

2.4M
Managed Lives

110+
Value-Based Contracts

$761.5M
Total CMS/CMMI Taxpayer Savings

$1.4B
Total Value Savings Paid Out

73
Participating Hospitals

- **Adaptability to Policy Changes**
- **Size, Scale and Multidisciplinary Clinical Integration across continuum**
- **Sophisticated Population Health Platform (infrastructure)**

ADVOCATE HEALTH

Key Tenets to Success in TCOC Models

		Provider Differences	Geographic Differences	Incentivizing Participation	Physician Compensation	Incentivize Beneficiaries	Payor Lessons
basic	Resource limits and lack of infrastructure	✓					
	Funding upfront costs						
	Opportunity differences due to baseline spend	✓					
	Risk of financial losses	✓					
	Level competition and more fragmented care						
	Access to technology		✓				
	Level of socio-economic deprivation		✓				
	Level of social determinants of health						
advanced	Degree of model flexibility			✓			✓
	Approach to risk-adjustment			✓			
	Integration of SDOH incentives						
	Continuum alignment (hospital, PCP, SPC)			✓			✓
	Embedded bundles				✓		
	Balance of mandate and resources availability						
	Physician compensation alignment				✓		
	Enhanced Benefits					✓	
	Patient awareness						
	Tailored care programs					✓	
	Coordination across payors and continuum						✓

Multiple programs in a single market causes conflict between programs resulting further fragmentation of the market

Appendix

Advocate Health Population Health Platform

Managing Health, Quality, and Total Cost of 2.4M Lives and $1.6B in capitated risk

13K+
Participating Physicians

15
ACOs / CINs / Networks

2.4M
Managed Lives

2 of 7
CMS ACO REACH Health System Participants in the Nation

110+
Value-Based Contracts

$761.5M
Total CMS/CMMI Taxpayer Savings

$1.4B
Total Value Savings Paid Out

73
Participating Hospitals

Value-Based Care success built-on capabilities fine-tuned over decades of experience managing shared savings, shared risk, professional and global capitation across CMS, commercial and Medicaid contracts.

- **Network Management**
- **Advanced Analytics**
- **Value Innovation**
- **Clinical Programs**
- **Data Management Infrastructure**
- **TPA/MSO**

TCOC Success Factors

Adaptability to Policy Changes

Early adoption and leadership in transformation initiatives, including participation in CMMI models, 1115 Medicaid waiver/transformation and commercial ACO risk

Size & Scale of Clinical Integration

CINs Across States: 3 Clinically Integrated Networks (CINs) managing 2.4 million value-based lives across five states

Multidisciplinary Engagement: Inclusion of primary care, specialists, hospitals, and post-acute networks

.

Population Health Platform

Advanced Analytics & Risk Modeling

Evidence-Based Protocols

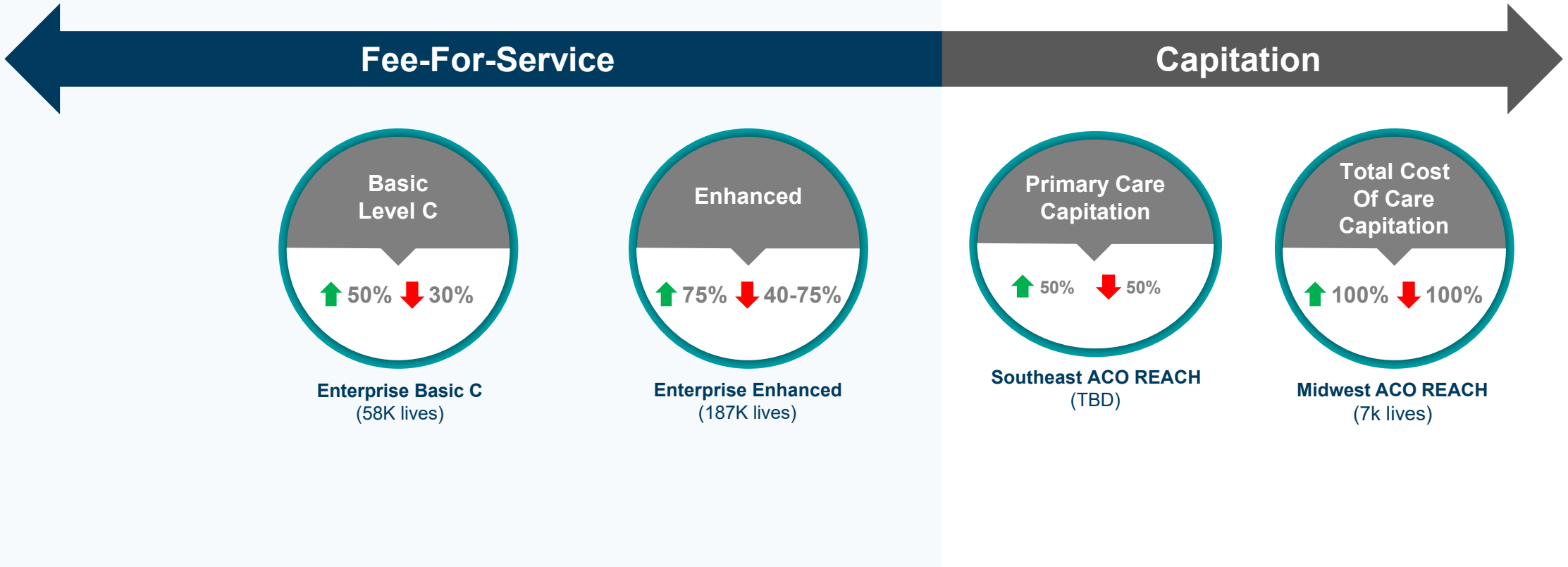
Focus on Preventive Care

Avoidable Cost Reduction & Quality Improvement

Value Innovation/Learning Health System

ADVOCATE HEALTH

Advocate Health CMS ACO Participation - 2025



~252,000 MSSP/REACH lives in downside risk
77% significant downside financial risk

Advocate Health ACO's

259,998
2024 Total Lives

94.2%
Average Quality Score

$761.5M
Total Generated Savings

$384.3M
Total Savings to the Networks

$128.2M
2022 Generated Savings

$69.9M
2022 Savings to the Network

$25.2M
2022 Total Savings Retained by AH

$46.5M
2023 Forecast

$79.8M
2023 Projected

Population Health Capabilities

Population Health Services

Network Management

- Contract Consulting & Negotiation
- Contract Management
- Field Operations
- Governance
- Network Steerage
- Network Curation
- Physician Engagement
- Risk-based Capital Reserves & Strategy

Infrastructure

- Sophisticated Interfaces to Ingest Payer, Employer, HIE Data
- Web-based Provider Tools
- Data Extracts & Mapping Multi-Systems
- Data Warehouse
- Licensed, Trained Staff Source
- Legal, Regulatory & Compliance Expertise
- Plug/Play API's for System-to-System Ease of Use
- Systematic Support for EMR Integration
- E-commerce

Clinical Programs

- Integrated Care Management & Navigation
  - Social Determinant Screening & Resolution
  - Care Transitions Program
  - Chronic Care Management
  - Disease Management
- Quality Improvement
- High Cost Claimant Assessment
- Condition Management & Documentation
- Palliative & Advance Care Planning
- Pharmacy Programs
- Integrated Behavioral health
- Continuing Post-acute care
- Clinical Transformation/Care Model Design
- Care Team Enablement (Actionable Data)

Analytics

- Gap Analysis
- Business Intelligence, Data Science & Analytics
- Performance Program Management
- Predictive/prescriptive analytics
- Scorecard/ feedback loop
- Risk Stratification

Value Innovation

- Deploy and test VBC innovation initiatives at scale across enterprise/diverse populations (equity) and geographies (rural vs. urban)
- Place emphasis on ensuring the aLHS and real world applicability/operations to new models of care, risk prediction and episodes of care to inform VBC operations, policy and payment.

TPA/MSO

- Enrollment, Attribution, Benefits
- Credentialing
- Claims Administration
- Referrals Management
- Utilization Management
- Financial Reporting & Solutioning
- Member-Provider Resolution Call Center
- Government Program Management

ADVOCATEHEALTH

Q&A

TOGETHER WE ARE ADVOCATE HEALTH

Roundtable Panel Discussion: Stakeholder Perspectives on a Pathway Toward Developing PB-TCOC Models

Mark McClellan, MD, PhD

Director & Professor, Business, Medicine, and Policy,
Duke-Margolis Institute for Health Policy,
Duke University

Perspectives on a Pathway Toward Developing Person-Based Total Cost-of-Care Models

Physician-Focused Payment Model Technical Advisory Committee (PTAC)

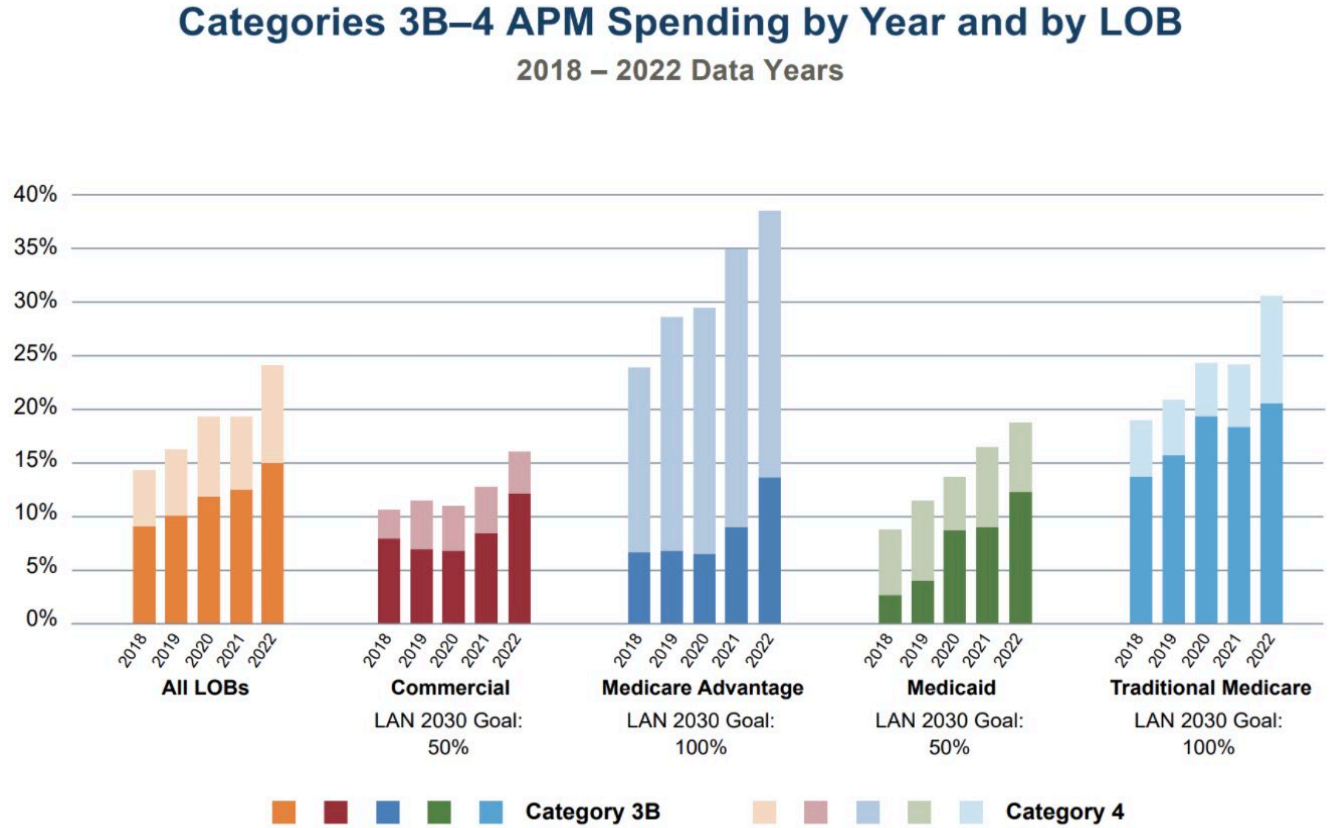
Mark McClellan, MD, PhD
September 16, 2024

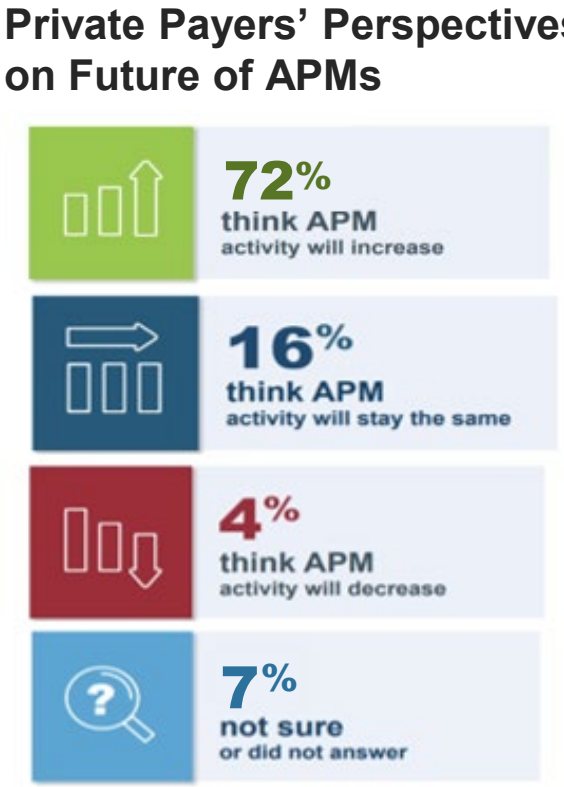
Duke | MARGOLIS INSTITUTE for Health Policy

Disclosures

Mark McClellan is an independent director on the boards of Alignment Healthcare, Cigna, Johnson & Johnson, and PrognomIQ. He serves as an advisor for Arsenal Capital, Blackstone Life Sciences, CRG, and MITRE, and is a Co-Chair of the Executive Forum of the Health Care Payment Learning and Action Network.

Growing Use of Alternative Payments to Support Whole-Person Care – Mainly for Primary Care, and Still A Ways to Go





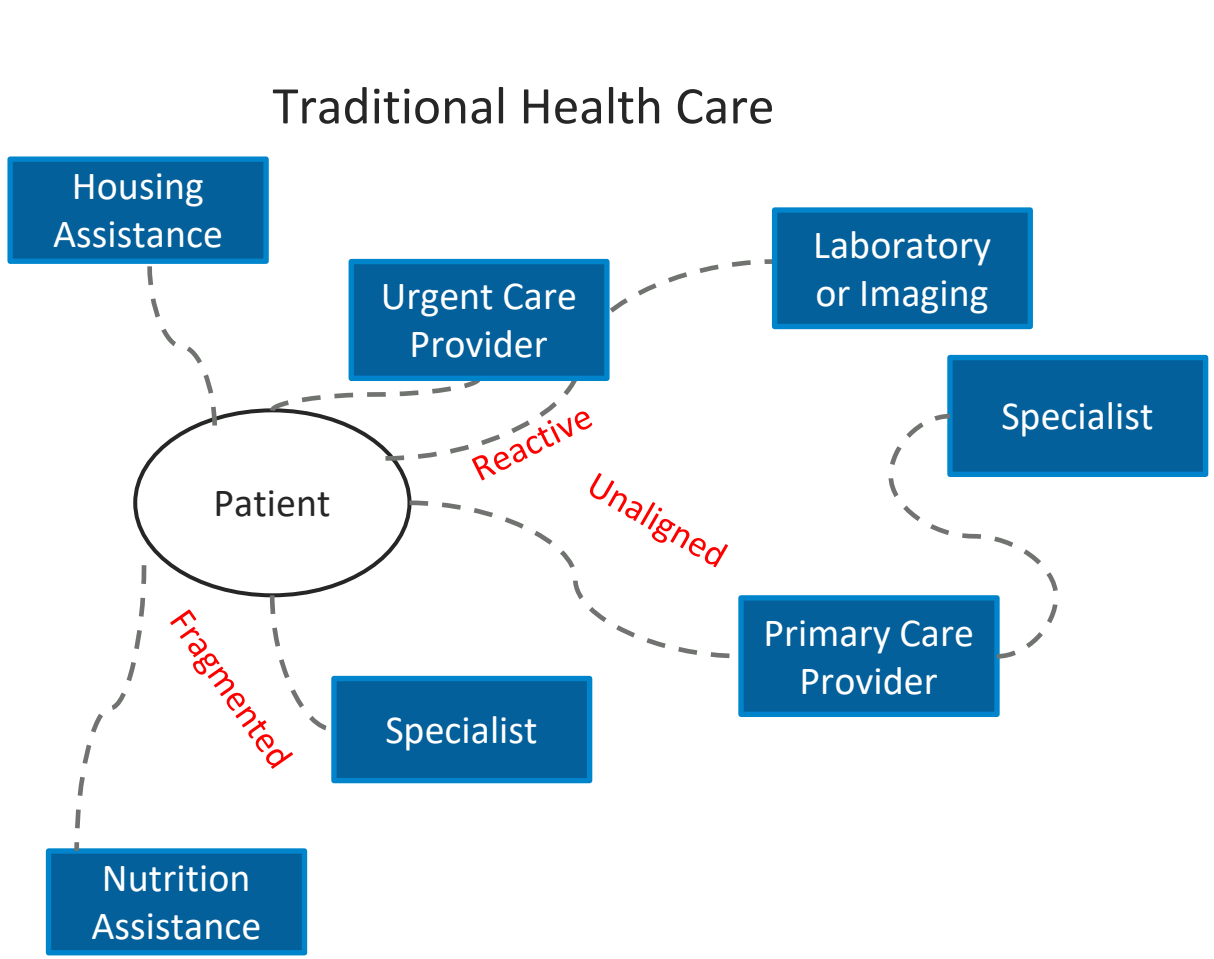
Alternative payment models feature partial ("Category 3B") of full ("Category 4") risk-adjusted, per-beneficiary payments to a primary care group or health care system that is accountable for results and total costs of care, with greater flexibility to pay for team members, products and services, and coordination activities not covered under "fee-for-service"

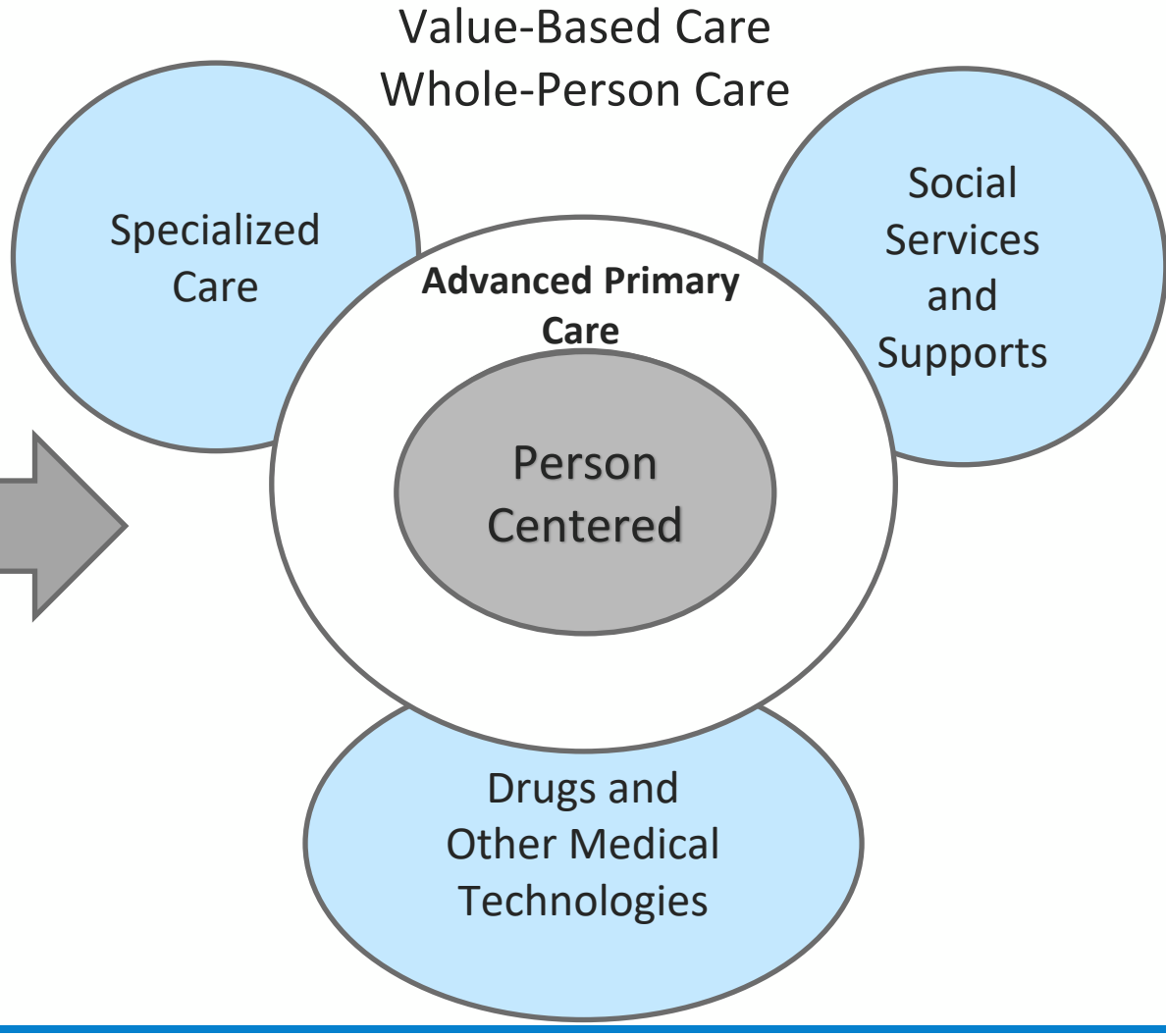
HCPLAN Health Care Payment Learning & Action Network

Source: https://hcp-lan.org/workproducts/apm-methodology-2023.pdf

Duke | MARGOLIS INSTITUTE for Health Policy

Transition to Value-Based Care Starting with Advanced Primary Care





Accelerating Progress Toward 2030 Goals

- Provide short-term incentives with more long-term certainty
  - Expanded opportunities in advanced alternative payment models to bill for supporting services (e.g. telehealth, community health workers, digital supports, care coordination)
  - Aligned transitional payment supports and quality bonuses, especially for smaller providers
  - Path to mandatory models including REACH/direct contracting
- Deepen multipayer alignment on standard data, measures, and core components
- Implement specialty support for longitudinal, coordinated care
  - "Nested" person-based alternative payments and data sharing for specialty care – voluntary for physician-led ACOs, mandatory for hospital-based ACOs
  - Enable aligned drug and technology payment reforms
- Shift Medicare Advantage payments from FFS toward whole-person benchmarks
  - Use EHR data not FFS claims data for risk adjustment
  - Transition to aligned, modernized STARS measures
- Support rapid learning networks to evolve payment and care within 5-year models
- Engage beneficiaries

Thank You

Contact Us

healthpolicy.duke.edu

Subscribe to our monthly newsletter at dukemargolis@duke.edu

1201 Pennsylvania Avenue, NW,
Suite 500 • Washington, DC 20004

DC office: 202-621-2800
Durham office: 919-419-2504

Follow Us

DukeMargolis

@dukemargolis

@DukeMargolis

Duke Margolis

Duke-Margolis Institute For Health Policy

Duke | MARGOLIS INSTITUTE *for* Health Policy

Appendix

CMS strategic commitment to advance coordinated, person-centered care and equity

CMS Strategic Aims

- All Medicare beneficiaries will have access to a care relationship with accountability for quality and total cost of care by 2030
- The vast majority of Medicaid beneficiaries will have access to a care relationship with accountability for quality and total cost of care by 2030

https://www.cms.gov/priorities/innovation/about/strategic-direction
https://www.healthaffairs.org/content/forefront/medicare-value-based-care-strategy-alignment-growth-and-equity

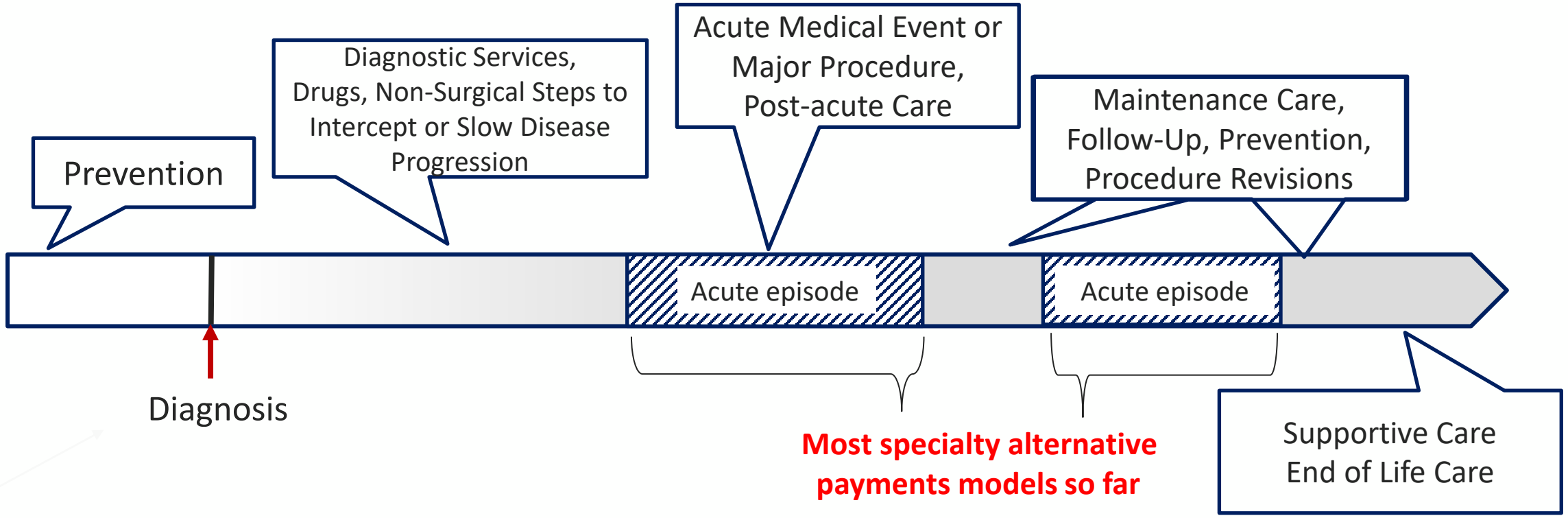
Duke | MARGOLIS INSTITUTE for Health Policy

Payment Reform and Specialty Care

- Advanced primary care with aligned supports for social needs provides foundation for improving access to care and reducing health disparities
- But all phases in a patient's care journey – prevention, screening, treatment, and longitudinal care – depend heavily and increasingly on specialized care
- And payment reforms to support value-based, coordinated *specialty care* are much less advanced than payment reforms to support primary care

Health Care from *Person* Perspective

Care Pathway or Care Journey with Primary, Specialty, and Primary-Specialty Care



Components of care pathway generally influenced by specialty care

The CMS Innovation Center's Strategy to Support Person-Centered, Value-based Specialty Care

1	Enhance Specialty Care Performance Data Transparency	Short-term Long-term
2	Maintain Momentum on Acute Episode Payment Models and Condition-Based Models	Short-term Long-term
3	Create Financial Incentives within Primary Care for Specialist Engagement	Short-term Long-term
4	Create Financial Incentives for Specialists to Affiliate with Population-based Models and Move to Value-Based Care	Long-term

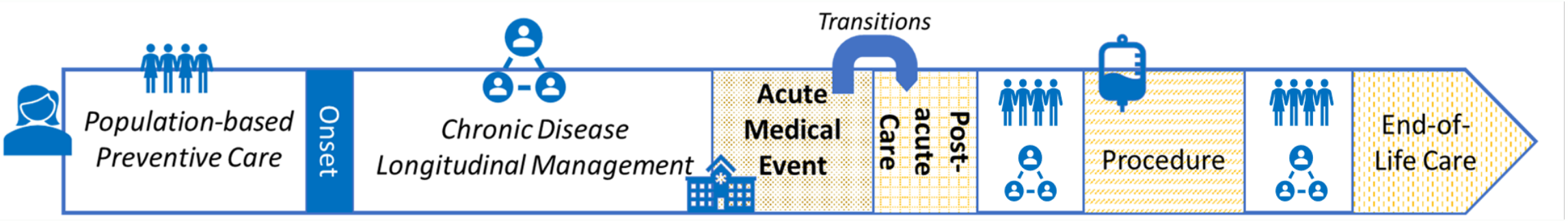
Source: Fowler et al., The CMS Innovation Center's Strategy to Support Person-Centered, Value-Based Specialty Care
https://www.cms.gov/blog/cms-innovation-centers-strategy-support-person-centered-value-based-specialty-care#_ftn10
(Figure based on Duke-Margolis/UT Dell presentation on comprehensive specialized care, Aug 2022.

Duke | MARGOLIS INSTITUTE *for* Health Policy

CMMI's Specialty Care Strategy

1 Increase Transparency Through Enhanced Data Sharing and Specialist Performance Measures

2 BPCI Advanced Extension
Mandatory Episode Payment Model



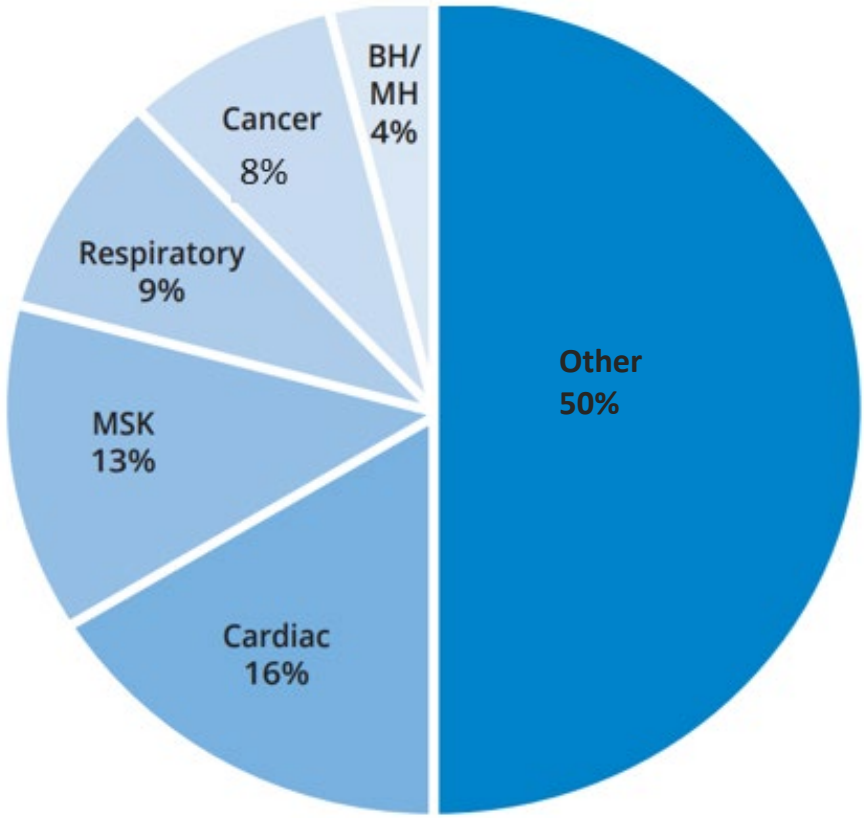
3 Specialist Engagement with Advanced Primary Care

4 ACO Condition and Procedure Management

Source: Fowler et al., The CMS Innovation Center's Strategy to Support Person-Centered, Value-Based Specialty Care
https://www.cms.gov/blog/cms-innovation-centers-strategy-support-person-centered-value-based-specialty-care#_ftn10
(Figure based on Duke-Margolis/UT Dell presentation on comprehensive specialized care, Aug 2022.

Duke | MARGOLIS INSTITUTE for Health Policy

Importance of Longitudinal/Chronic Care: Five Specialties Account for Large Share of Medicare Disease Burden and Spending



Important Considerations

Cardiology and Musculoskeletal	Many procedures of low/no value – better longitudinal patient management and accountability can encourage appropriateness
Respiratory	Many acute hospitalizations could be avoided with better-coordinated management of COPD and other chronic respiratory conditions
GI	Limited support for longitudinal care coordination for patients with IBD to avoid and manage flares
Cancer	Efficient and effective prevention and screening Shared decisionmaking and use of evidence-based therapies for initial treatment and subsequent care Coordinated management of treatment complications Collaborative management of surveillance and downstream complications for cancer survivors

Source: https://healthpolicy.duke.edu/sites/default/files/2022-11/Strengthening%20Specialist%20Participation%20in%20Comprehensive%20Care%20through%20Condition-Based%20Payment%20Reforms.pdf

Duke-Margolis Medicare Risk Adjustment Modernization Framework

- Key features
  - Transition to use of data derived from electronic data systems that support and improve care delivery, with the goal of detecting and managing important patient risks, to increase risk measurementt accuracy and reduce burden
  - Use such data from non-FFS beneficiaries for accurate estimates of risk adjustment factors, particularly for conditions that may be underdiagnosed/undertreated in FFS, claims-based diagnoses associated with higher resource costs in FFS practice than accountable care practice, and other sources of accuracy gains in moving away from reliance on traditional claims data
  - Create synergies between data exchange and collection requirements for risk adjustment and for other major CMS programs, including CMS' quality measurement modernization strategy

- Aligns with emerging CMS strategy for modernizing performance measurement
  - Current regulations and proposed steps for "Universal Foundation" strategy for modernizing data and methods used for quality improvement and performance reporting build upon electronic standards and interoperability
  - For example, certified EHRs must support provider-authorized bulk export of clinical data to platforms used by CMS and other payers, and could enable incorporation of relevant data from other sources, creating stronger incentives to invest in data infrastructure and analytics that improve care

Source: https://healthpolicy.duke.edu/sites/default/files/2024-03/Modernizing_Medicare_Risk_Adjustment_and_Performance_Measurement.pdf

Roundtable Panel Discussion: Stakeholder Perspectives on a Pathway Toward Developing PB-TCOC Models

Palav Babaria, MD, MHS

Chief Quality Officer and
Deputy Director of Quality and Population Health Management,
California Department of Health Care Services

California Department of Health Care Services

- Palav Babaria, MD, MHS
- Chief Quality & Medical Officer; Deputy Director, Quality & Population Health Management

Population Health. One in three Californians (>14 million) are enrolled in Medi-Cal, with more than 65% of enrollees identifying as people of color

Children & Youth. Medi-Cal covers >40% of all births in California, with about two-thirds of children enrolled in Medi-Cal identifying as Black and Latino

Complex Needs & Unmet Care. More than two in three patient days in a California long-term care facility are covered by Medi-Cal

Justice-Involved. At least 80% of justice-involved individuals are eligible for Medi-Cal

DHCS

Key Takeaways for TCOC Models

- Creating multi-payer alignment with public purchasers
- Strengthening and centering primary care across payers
- Creating an approach to quality measurement that spans different populations

DHCS

Roundtable Panel Discussion: Stakeholder Perspectives on a Pathway Toward Developing PB-TCOC Models

Michael E. Chernew, PhD

Professor, Health Care Policy, Director, Healthcare Markets and Regulation (HMR) Lab, Department of Health Care Policy, Harvard Medical School

Perspectives on a Pathway Toward Developing PB-TCOC Models

Michael Chernew
Leonard D. Schaeffer Professor of Health Care Policy
Harvard Medical School

Sept 16, 2024

Disclaimer

- The opinions I present represent my personal views and do not necessarily reflect the views of organizations I am affiliated with, most importantly, MedPAC.

Main Thoughts

- Not a fan of the ‘test and diffuse’ paradigm
  - The performance of any given model depends on other available models
    - Selection effects
    - Siphoned savings
  - Sunsetting of models may degrade impact

➔ Create a portfolio of synergistic models

➔ Tweak but don’t continually redesign and launch new models

Design/Policy Issues

- Avoid Ratchet
  - Prior savings adjustment
  - Regional benchmark blends
  - Administrative benchmarks
- Improve ability to detect stinting
- Don’t micro-manage ACO activities
  - Success depends on context
  - ACO success requires flexibility
- APM bonus must be coordinated with primary care capitation policies and various primary care global service/ care management codes

Roundtable Panel Discussion: Stakeholder Perspectives on a Pathway Toward Developing PB-TCOC Models

Charlotte S. Yeh, MD, FACEP

Founder, Yeh Innovation and
Former Chief Medical Officer, AARP Services, Inc.

Charlotte S. Yeh, MD FACEP

Emergency Physician
Innovator in Consumer Design & Engagement

- **Former Chief Medical Officer**
  - **AARP Services, Inc.**
- **Founder**
  - **Yeh Innovations, LLC**
- **Chief Experience Officer**
  - **Cherish Health**
- **Former CMS Regional Administrator**
- **Numerous advisory, consultant, board roles across the HealthCare ecosystem**

Success Means:

- Improved Outcomes
- Improved Experiences
- Cost Savings
- Actionable
- Scalable

Equal engagement

Physician **Beneficiary**

Beneficiary Value:

Cost

Convenience

Choice

Coordination

Compassion

Opportunity for Success:

Integrated Care Management, Medicare Supplemental Plan

Appendix:

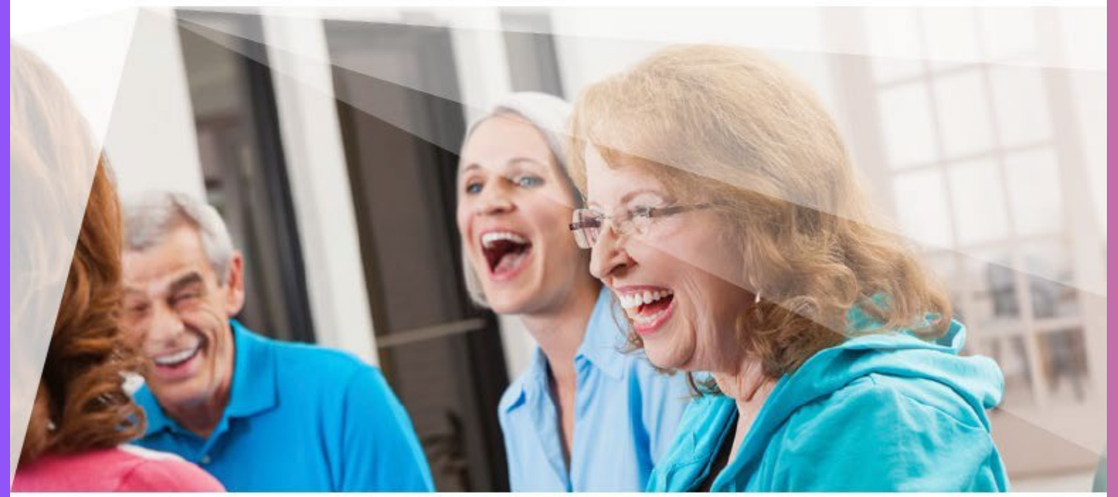
- **Mercer (2014):** Integrated Patient-Centered Care Management in the Medicare Supplement Population, A Viable Solution to Fragmented Care and Escalating Costs
- **Mercer (2018):** Integrated Patient-Centered Management in the Medicare Supplement Population, Updated Results from the MyCarePath Pilot Program
- **Ongoing Nurse Support (2021):** Information Sheet and Experience Overview – Creating a Consumer Centric Personalized Experience of Trust
- **Musich, S. (2020):** The Additive Impact of Multiple Psychosocial Protective Factors impact on Selected Health Outcomes Among Older Adults

MERCER

TALENT • HEALTH • RETIREMENT • INVESTMENTS

INTEGRATED PATIENT-CENTERED CARE MANAGEMENT IN THE MEDICARE SUPPLEMENT POPULATION

A VIABLE SOLUTION TO FRAGMENTED CARE AND ESCALATING COSTS



MARSH & McLENNAN COMPANIES

EXECUTIVE SUMMARY

- Results of a voluntary care management pilot program suggest that using a patient-centered approach, focused on the needs and personalized goals of the patient (patients participating in the program), reduces care fragmentation while lowering Medicare and patient out-of-pocket costs.
- Care coordination and assisting the patient and family with navigation beyond just medical treatment increases patient satisfaction and supports the ability to live independently longer.
- This approach is promising and can be implemented in the current fee-for-service environment while the transition to a fee-for-value delivery system is under way.

THE PROBLEM

One of the greatest problems facing health care in America today is the rapidly increasing number of older adults struggling with multiple chronic conditions. These "poly-chronics" see many different health care providers in many care settings. According to the Congressional Budget Office,[1] annual growth in health care spending has outpaced growth in Gross Domestic Product (GDP) by an average of 1.5% since 1985, and net government expenditures for health care are projected to increase from 4.6% of GDP in 2013 to 8% in 2038 — more than half of which would be spent on Medicare.[2]

Of the 50 million Americans covered by Medicare, 20% choose to purchase a Medicare supplement insurance plan (typically referred to as a "Medigap" plan) to help defray out-of-pocket expenses from copayments, coinsurance, and deductibles associated with Medicare coverage.[3,4,5] Consumer surveys indicate that beneficiaries value the supplemental benefit because it fills gaps in their Medicare coverage without restricting the providers they can see.

While older Medicare beneficiaries generate some of the highest health care costs due to their numerous health conditions and are at risk for poor outcomes, more could be known about the complexity of issues this population faces. In order to better serve this population and achieve a more coordinated care management experience, additional research is needed to understand their demographics, lifestyle choices, socioeconomics, family/caregiver support systems, condition prevalence, and — most important — what these individuals want and hope for as they face health issues that come with aging. Until recently, very few attempts have been made to help fee-for-service beneficiaries with multiple health issues effectively manage their health by providing care coordination. New and better tools and/or services specifically developed for the aging population are critical to meet this growing demand for healthier and less costly aging.

[1]Congressional Budget Office. The 2013 Long-Term Budget Outlook, available at http://cbo.gov/sites/default/files/cbofiles/attachments/44521-LTBO2013_0.pdf.

[2]deBruyn J. "Blame the ACA as Health Care Spending Increases Relative to GDP" (Nov. 5, 2013), Triangle Business Journal, available at http://www.bizjournals.com/triangle/news/2013/11/05/blame-the-aca-as-health-care-spending.html.

[3]The Henry J. Kaiser Family Foundation. Total Number of Medicare Beneficiaries, available at http://kff.org/medicare/state-indicator/total-medicare-beneficiaries.

[4]AHIP Center for Policy and Research. Trends in Medigap Coverage and Enrollment, 2012 (May 2013), available at http://www.ahip.org/trends-medigap-coverage-enroll2012.

[5]Jaffe S. "Officials Looking to Cut Federal Spending Eye Medigap Policies" (Nov. 21, 2011), Kaiser Health News, available at http://www.kaiserhealthnews.org/stories/2011/november/22/medigap-and-federal-policies.aspx.

KEY FINDINGS

1. While not a silver bullet for improving quality or reducing costs, a consumer-engagement strategy can work toward these goals. It requires building a trusted relationship and focusing on living well at home, inclusive of the patient's personal environment, family, and caregivers. This is not an easy task, but keeping the focus on the patient's needs can yield better outcomes and reduced costs.

2. Programs that focus on the coordination of care delivered through the consumer have been underutilized to date, but with the right approach they can address the fragmentation and growing costs of health care.

3. To date, the Medigap population — as a potential opportunity to address Medicare fee-for-service program challenges — has been largely ignored despite the population being nearly two-thirds the size of the Medicare Advantage population, and about the size of the dual-eligibles population.

4. The Medigap plans can be utilized/considered for more than simply transactional secondary payer activities.

A UNIQUE APPROACH

While some Medicare Advantage plans have demonstrated improved cost and quality with care-coordination efforts, many have questioned whether this could be achieved within the Medigap plans while still preserving freedom of choice to beneficiaries. Unlike Medicare Advantage plans, fee-for-service Medicare and Medigap plans do not have the traditional levers of narrow provider networks, negotiated fees, and benefit design to help facilitate provider navigation. In contrast, fee-for-service Medicare and Medigap plans (for those consumers who enroll in them) preserve freedom of choice with the standardized Medicare benefit structure, which means consumer engagement in health management support becomes the dominant lever for improvement.

Those who serve the aging population have long known about the problems associated with caring for individuals with chronic conditions — a population that is challenged to stay independent for as long as possible. To address this, AARP Services Inc. (ASI, a taxable subsidiary of AARP) and UnitedHealthcare (UHC) joined forces as part of a health care transformation initiative, with the goal of gaining a better understanding of the characteristics, needs, and general health of older adults who purchase Medigap coverage. Equally important, the initiative strove to test whether UHC could enhance care coordination and the delivery of services to Medigap insureds with complex needs, while managing costs and improving their quality of care. After several years of monitoring the program, results suggest that delivering care coordination through a Medigap plan has great potential in creating concrete change in the current health system.

THE PROGRAM

In 2008, pilot programs ("pilots") were created, focusing on Medicare beneficiaries with chronic diseases who enrolled in AARP™ Medicare Supplement Insurance Plans insured through UnitedHealthcare. The objectives of the pilots were to improve the experience of care, make a meaningful difference in the AARP Medicare Supplement Plan insureds' daily lives, and demonstrate a social impact — the latter of which could be accomplished by improving care affordability through the provision of guidance, navigational help, and support to address both the health and the other personal needs of participating insureds. While the pilots sought to examine how well existing tools and services benefited this population, a critical goal was to test new approaches. This "test and learn" philosophy was implemented to reveal both successes and failures among all pilot features to help keep pace with the changing world of health care delivery and make adjustments as needed.

The pilots utilized various case management, disease management, and depression management program components to determine how best to support the care of AARP Medicare Supplement Plan insureds with complex needs. Participation was voluntary and was provided at no

additional cost to the insureds. Those selected ("participants") were at least 65 years of age and the more complex patients (that is, they had multiple conditions and/or life-threatening illnesses). Each participant was supported through a trained team of nurses, social workers, behavioral health specialists, and medical directors. Initial care assessments were performed either in the home or over the phone.

ASI and UHC believed that a consumer-centric approach focusing on care coordination and navigation, beyond just medical treatment, would not only help the consumer but could also reduce variation and provider costs — and ultimately, Medicare program costs. Resources were built around the patient's needs and personal goals. Importantly, sometimes these goals were oriented toward social, rather than clinical, objectives, such as attending a granddaughter's graduation or being able to live at home. Participants received personalized care plans developed by their nurse/case manager in collaboration with their physician and caregiver(s). In some pilots, trained social workers assisted participants with social services, such as facilitating in-home assessments, coordinating meals and social activities, and identifying transportation options. In others, technology and innovation played an important role, with initiatives that included in-home monitoring devices for patients with congestive heart failure.

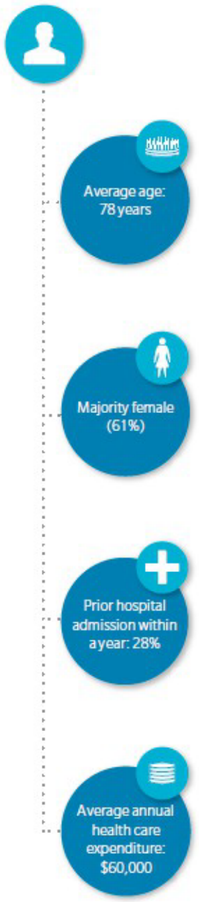
PILOT RESULTS

The evaluation of the pilot programs showed that comprehensive case management, depression care, and remote monitoring of congestive heart failure in particular hold the greatest promise in transforming health care for older individuals with some of the most prevalent health conditions. Standalone telephonic disease management, however, was not successful in reducing costs and it did not adequately address issues of greatest concern to Medigap users, their families, and caregivers in terms of coping successfully at home and staying independent while dealing with serious health conditions.

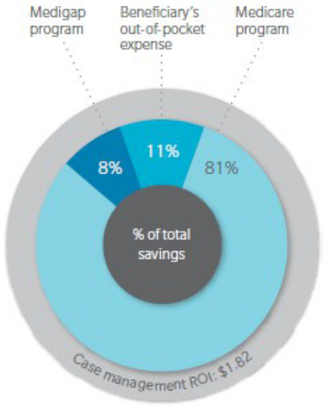
Between 2009 and 2012, more than 28,000 AARP Medicare Supplement Plan insureds participated in the pilot programs. Approximately 7,000 active participants were enrolled in the pilots each month. Along with a high satisfaction rate among participants, other noteworthy findings included:

- Financial results tended to be more favorable for those participants who received the most intensive interventions through case management ($1.82 ROI) and depression management ($1.67 ROI), as compared to the disease management programs and telephonic case management, which did not result in a positive return on investment.
- Savings accrued predominantly to the Medicare program itself (81% of total savings) and to a lesser extent to the Medigap program (8%) and the beneficiary's out-of-pocket expense (11%).

PILOT PARTICIPANT PROFILE



SAVINGS DISTRIBUTION



- Participants who received interventions that included a component of remote monitoring by nurses experienced a significant reduction in hospital readmissions.
- Participants who received face-to-face case management were more likely to keep up with recommended annual office visits and laboratory tests and avoid drugs not suitable for the elderly — and they demonstrated better understanding of how to better manage their conditions after participating.
- Participants in the face-to-face case management program experienced a reduction in hospital readmissions and were more compliant with office visits.
- Clinical support for depression resulted in an average reduction in overall depression symptoms.

Of significant importance is the revelation that patients feel they are more than merely discrete "diseases" — they see themselves as individuals trying to succeed with multiple complex conditions. AARP Medicare Supplement Plan insureds valued the pilots because they provided a means to stay independent at home. Specifically, the program showed that individuals needed and wanted as much support with nonmedical aspects of care — such as transportation, social-network development, home improvement, and nutrition — as with medical aspects of care. High participant satisfaction rates, increased use of appropriate services, and a greater understanding of what insureds perceived as quality care were demonstrated when the program delivered care that centered on those things that insureds valued as meaningful and necessary to coping and living successfully. Furthermore, participants reported that their quality of life improved as a result of participating in the pilots, and they also said they were better able to manage their pain.

Building on the promising findings to date and making adjustments based on lessons learned, ASI and UHC have evolved these programs into a new, more comprehensive program. The new focus of the program is aimed at providing "whole person" support by focusing on both physical and mental health, with a special emphasis on targeting a participant's personal goals and needs, such as living independently.

The new comprehensive care management program consists of both telephonic and in-home care management support, to include co-morbid depression care and remote monitoring for those insureds with congestive heart failure. Care management is provided by a team of clinical support staff, led by a licensed registered nurse, who is the engaged insured's primary point of contact and care-coordination navigator. In order

to achieve the insureds preference to live well at home, the "whole person" approach includes, but is not limited to, services outside of the typical medical management of various conditions, such as:

- Assessment of medical and psychosocial needs and strengths.
- A plan of care based on the participant's personal goals.
- Assessment and support of caregiver(s) needs.
- Social worker services (for example, helping arrange financial assistance, transportation, and other logistical planning).
- Home safety checks, with home improvement referral services as needed.
- Nutritional advice, with meal preparation services, as needed.
- Advance-care planning, including medication review and management.
- Specialty and ancillary referrals (for example, dental, vision, hearing, and/or physical therapy services).
- Social support and networking.
- Use of "storytelling" to assist with improving the individual's sense of self-worth.

IMPLICATIONS FOR FUTURE OPPORTUNITIES AND HEALTH CARE POLICY

This study shows that:

- The perceptions and experiences of fee-for-service Medicare as a traditional, transaction-based system can shift to a personalized service that incorporates partnership, family support, and navigational help while preserving freedom of choice to match individual values (that is, the ever-pressing goal of transforming US health care into a fee-for-value model).
- The consumer-engagement approach can improve health outcomes and health care affordability, bringing savings for the Medicare program and reduced cost for the AARP Medicare Supplement Insurance Plan policyholder through reduced out-of-pocket expenses and stable premiums. More research and efforts are warranted to support additional private/public partnerships, such as between traditional Medicare and Medigap plans, to improve the well-being of Medicare beneficiaries and affordability of Medicare. A program such as the pilots described in this paper is something that can be implemented in the current fee-for-service environment while the transition to fee for value is under way.

For further information, please contact:

Dan Gold, PhD
Minneapolis

Kristin Parker, PhD, MPH
Norwalk

Mercer was retained by AARP Services Inc. (ASI) to provide guidance on the program evaluation design of care management pilot programs for Medicare beneficiaries enrolled in AARP Medicare Supplement Insurance Plans insured through UnitedHealthcare and to help interpret the results of the program evaluation based on information and materials provided by UnitedHealthcare. Mercer was retained by ASI to produce this paper, including the development of the content, layout, and final production.

MERCER

For further information, please contact
your local Mercer office or visit our website at:
www.mercer.com

Argentina	Netherlands
Australia	New Zealand
Austria	Norway
Belgium	Peru
Brazil	Philippines
Canada	Poland
Chile	Portugal
Colombia	Saudi Arabia
Denmark	Singapore
Finland	South Africa
France	South Korea
Germany	Spain
Hong Kong	Sweden
India	Switzerland
Indonesia	Taiwan
Ireland	Thailand
Italy	Turkey
Japan	United Arab Emirates
Mainland China	United Kingdom
Malaysia	United States
Mexico	Venezuela

13553-HB-2910-2014

HEALTH WEALTH CAREER

INTEGRATED PATIENT-CENTERED MANAGEMENT IN THE MEDICARE SUPPLEMENT POPULATION

UPDATED RESULTS FROM THE MYCAREPATH PILOT PROGRAM

MAKE TOMORROW, TODAY MERCER

New and better tools and/or services specifically developed for the aging population are critical to meet this growing demand for healthier and less costly aging.

THE PROBLEM

One of the greatest problems facing healthcare in America today is the rapidly increasing number of older adults struggling with multiple chronic conditions. These "poly-chronics" see many different healthcare providers in many care settings. According to the Congressional Budget Office,[1] annual growth in healthcare spending has outpaced growth in Gross Domestic Product (GDP) by an average of 1.5% since 1985, and net government expenditures for healthcare are projected to increase from 4.6% of GDP in 2013 to 8% in 2038 — more than half of which would be spent on Medicare.[2]

Of the almost 60 million Americans covered by Medicare, approximately 20% choose to purchase a Medicare supplement insurance plan (typically referred to as a "Medigap" plan) to help defray out-of-pocket expenses from copayments, coinsurance and deductibles associated with Medicare coverage.[3,4] Generally, beneficiaries indicate they value the supplemental benefit because it fills gaps in their Medicare coverage without restricting the providers they can see.

While older Medicare beneficiaries generate some of the highest health care costs due to their numerous health conditions and are at risk for poor outcomes, more could be known about the complexity of issues this population faces. To better serve this population and achieve a more coordinated care experience, additional research is needed to understand their demographics, lifestyle choices, socioeconomics, family/caregiver support systems, condition prevalence and — most important — what these individuals want and hope for as they face health issues that come with aging. Until recently, very few attempts have been made to help fee-for-service beneficiaries with multiple health issues effectively manage their health by providing care coordination. New and better tools and/or services specifically developed for the aging population are critical to meet this growing demand for healthier and less costly aging.

[1] Congressional Budget Office. *The 2013 Long-term Budget Outlook*, available at http://cbo.gov/sites/default/files/cbofiles/attachments/44521-LTBO2013_0.pdf.
[2] deBruyn J. "Blame the ACA as Health Care Spending Increases Relative to GDP" (Nov. 5, 2013), *Triangle Business Journal*, available at http://www.bizjournals.com/triangle/news/2013/11/05/blame-the-aca-as-health-care-spending.html.
[3] The Henry J. Kaiser Family Foundation. *Medigap Enrollment Among New Medicare Beneficiaries: How Many 65-Year Olds Enroll In Plans With First-Dollar Coverage?*, available at https://www.kff.org/medicare/issue-brief/medigap-enrollment-among-new-medicare-beneficiaries.
[4] https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/Dashboard/Medicare-Enrollment/Enrollment%20Dashboard.html.

A UNIQUE APPROACH

Although many Medicare Advantage plans have used care-coordination efforts to improve cost and quality of care within their network of providers, it was not certain that the same could be achieved with Medigap plans while still allowing beneficiaries the freedom of provider choice. Fee-for-service Medicare and Medigap plans lack the traditional levers of provider networks, negotiated fees and benefit design to assist with navigating the provider network. Such plans allow beneficiaries to see any provider that accepts Medicare (that is, no network), which preserves freedom of choice given the standardized Medicare benefit structure, which makes consumer engagement in health management support the dominant lever for improvement.

Most individuals want to stay as independent as possible as they age, but those with chronic conditions face extra challenges. To address these challenges, AARP Services Inc. (ASI, a taxable subsidiary of AARP) and UnitedHealthcare (UHC) joined forces as part of a healthcare transformation initiative to better understand the characteristics, needs and general health of older adults with Medigap coverage. The initiative was designed to test whether UHC could enhance care coordination to insured individuals with complex care needs while managing costs and improving the quality of care through focused patient engagement. Results show that care coordination is truly transforming the health system for this population, as this paper will demonstrate.

> Care coordination is truly transforming the health system for this population.

THE PILOT PROGRAM

The pilot programs for Medicare beneficiaries ages 65 and older with complex chronic diseases who were enrolled in AARP™ Medicare Supplement Insurance Plans insured through UHC began in 2008, with the goal of improving the care experience, making a meaningful difference in the participants' daily lives and demonstrating social impact (improved care affordability through guidance, navigational health and other personal needs of the insured members). Participants were supported by a trained multidisciplinary team that tailored resources around each patient's specific needs and personal goals — some of which were more social rather than clinical in nature. ASI and UHC believed that a consumer-centric approach focusing on care coordination and navigation, beyond just medical treatment, would not only help the consumer but could also reduce care variation and provider costs — and, ultimately, Medicare program costs. The pilots, which had more than 30,000 participants, showed that comprehensive case management, depression care and remote monitoring of congestive heart failure and fall prevention in particular hold the greatest promise to transform healthcare for this population. This evidence came through program evaluations conducted by OptumInsight Advanced Analytics. Better adherence with recommended office visits, preventive diagnostic and laboratory tests was achieved, with reduced hospital readmissions and emergency department visits. Furthermore, savings were achieved for the Medicare program itself, the Medigap program and even the beneficiary's out-of-pocket expenses, with the most promising programs demonstrating $1.67–$1.82 returns on investment (ROIs). The program had a high satisfaction rate among participants, who said they valued the pilot program because it provided a means to stay independent at home and improved their quality of life. Specific details about the initial pilot program and its results can be found in the paper *Integrated Patient-Centered Care Management in the Medicare Supplement Population*.[5]

[5] Gold and Parker. "Integrated Patient-Centered Care Management in the Medicare Supplement Population: A Viable Solution to Fragmented Care and Escalating Costs" Mercer. 2014.

MYCAREPATH PROGRAM

With the pilots showing so many positive outcomes, ASI and UHC decided to evolve the programs — making adjustments where needed, based on lessons learned — into a more comprehensive care management program. MyCarePath is designed to address both physical and mental health while taking into account a participant's unique goals and needs, such as living independently. The program, which consists of an annual in-home assessment and telephonic care management, is supported by a team of clinical staff, led by a registered nurse who serves as the participant's primary point of contact and care navigator. In addition, MyCarePath provides co-morbid depression support and remote monitoring for patients with congestive heart failure.

MyCarePath is designed to address both physical and mental health while taking into account a participant's unique goals and needs, such as living independently.

To help insured individuals who prefer to continuing living at home, the program uses a "whole person" approach that goes beyond the typical scope of medical management, including:

- Assessment of medical and psychosocial needs and strengths
- A plan of care based on the participant's personal goals
- Assessment and support of caregiver(s) needs
- Social workers who provide help finding resources in the community that beneficiaries may qualify for, such as financial assistance for medication, long term in-home service and transportation
- Caregiver support
- Home safety checks, with referral to home improvement services, as needed
- Nutritional advice, from a registered dietician with referral to meal preparation services, as needed
- Advance-care planning
- Medication review and management
- Specialty and ancillary referrals (for example, dental, vision, hearing and/or physical therapy services)
- Social support and networking

MYCAREPATH RESULTS

Between mid-2013 and 2016, more than 28,000 AARP Medicare Supplement insureds participated in MyCarePath. Along with a continued high satisfaction rate among participants, the following key findings highlight the successes of the programs:

- The initial target participant pool was broadened to expand beyond those with the highest Hierarchical Condition Category (HCC) scores, yet the program still achieved overall savings of 3% based on comparisons to the engaged members' previous claims history against a control group.
- The data can be used to aid in the selection of the target populations that could benefit most from the program and provide the greatest ROI:
  - **HCC scores:** The program was most effective among members with the highest HCC scores (defined as insureds likely to spend 3.75 times the average), providing a $7.9:1 ROI (a savings of 24% of claims).
  - **Likelihood to succeed:** The use of predictive analytics to identify those most likely to benefit from the program had an ROI of $5.1:1 (a savings of 22% of claims).
  - Highest HCC scores and likelihood to succeed: When combining both of these items, the ROI was $10:1.
- Savings accrued predominantly to the Medicare program itself (87% of total savings) — and, to a lesser extent, the Medigap program (11%) and the beneficiary's out-of-pocket expenses (2%).

It should be noted that ROI did not occur overnight. The highest ROI was related to those engaged in the program for 12 or more months ($2.5:1 ROI) as compared to those who participated for a shorter duration, which did not result in a positive ROI.

The benefits to the insured members are also noteworthy. Inpatient admissions among participants decreased by 28% and emergency room visits decreased by 10% compared to non-participants. Furthermore, among participants engaged in the program for 12 months or longer, inpatient admissions decreased by 44% and emergency room visits decreased by 28%.

Using a patient-centered approach, focused on the needs and personalized goals of the patient, reduces care fragmentation while lowering Medicare spending and patient out-of-pocket costs.

IMPLICATIONS FOR FUTURE OPPORTUNITIES AND HEALTH CARE POLICY

The results of MyCarePath suggest that using a patient-centered approach, focused on the needs and personalized goals of the patient, reduces care fragmentation while lowering Medicare spending and patient out-of-pocket costs. And care coordination and assistance beyond navigating medical treatment increases patient satisfaction and supports the ability to live independently longer. Therefore:

- The perceptions and experiences of fee-for-service Medicare as a traditional, transition-based system can shift to a personalized services that incorporate cooperation, family support and navigational health while preserving freedom of choice to match individual values (that is, the ever-pressing goal of transforming US healthcare into a fee-for-value model).
- The consumer-engagement approach can improve health outcomes and healthcare affordability, bringing savings for the Medicare program and reduced cost for the AARP Medicare Supplement Insurance plan holder through reduced out-of-pocket expenses. More research and efforts are warranted to support additional private/public partnerships, to help improve the well-being of Medicare beneficiaries and affordability of Medicare. A program such as *MyCarePath* is something that can be implemented in the current fee-for-service environment while the transition to fee for value is underway.
- Furthermore, more can be done to transform the current healthcare landscape. With more Americans living longer than ever, and the US population of adults ages 65 and older now is the fastest-growing segment of the population,[6] the challenge to improve the experience and cost of aging will only grow. ASI and UHC are continuing to partner to change the perception of aging, the costs of aging and the health outcomes of aging to result in a more fruitful, positive society.

Aging Strong 2020[7] is a new program designed with a goal of assisting insured members in withstanding life's challenges and becoming more resilient through the three levers of purpose, social connectedness and optimism. Several pilot projects have been developed and will be launched in 2018 to engage members in actions that will strive to have a positive impact on these three levers. ASI and UHC will measure whether a significant impact can be made on members' lives — the expectation is that as members become more resilient, which may translate into better health outcomes and better quality of life. The aim is not only to improve outcomes, the experience of care and affordability of healthcare, but also to improve society as a whole.

For further informstion, please contact:

Kristin Parker, PhD, MPH
Norwalk

Agnes Quiggle, MS
New Orleans

[6] https://www.census.gov/prod/cen2010/briefs/c2010br-09.pdf
[7] Gold and Parker. "Integrated Patient-Centered Care Management in the Medicare Supplement Population: A Viable Solution to Fragmented Care and Escalating Costs" Mercer. 2014.

For further information, please contact your local Mercer office or visit our website at: www.mercer.com.

6004736b-HB

MARSH & McLENNAN COMPANIES

Ongoing Nurse Support (ONS) Information Sheet and Experience Overview

Creating a **Consumer Centric** Personalized Experience of Trust

AARP | Medicare Supplement from UnitedHealthcare

Can a telephonic consumer centric care coordination program improve health outcomes and affordability through engagement in a Fee-for-Service environment?*

YES

Care coordination helps those dealing with complex health situations take charge of their health and build a sense of community with their health plan by understanding and addressing their needs. Evaluation shows improved experience, outcomes, and affordability for Secondary Payer Plans and Fee-for-Service success.

1 Identification & Segmentation

Innovative analytics to identify members for outreach with health risks and propensity to succeed

Propensity to Succeed Index

- Likelihood to engage
- Likelihood to have positive ROI
- Likelihood to have improved clinical quality

Health Check In Assessment

- Self-reported health status based on validated wellness questions

2 Engage & Manage

- **Access to Telephonic Support:** Registered Nurses, Dieticians, Social Workers, Community Health Workers, Physicians, Pharmacist Consultants
- **Engagement Channels:** Phone, Digital, Print

ASSESS | PLAN | CONNECT | EDUCATE | SUPPORT

AREA OF FOCUS: Help with goal setting, medication review, end-of-life discussions, condition-specific education and resources, depression management, reduce falls risk, caregiver support, and connection with community resources and other Healthplan Services as appropriate*

3 Evaluate Outcomes

EVALUATION SHOWS IMPROVED

MEMBER EXPERIENCE

HEALTH OUTCOMES

AFFORDABILITY

FOR SECONDARY PAYER PLANS + FEE-FOR-SERVICE SUCCESS

Source: 2019 UnitedHealthcare Ongoing Nurse Support Evaluation

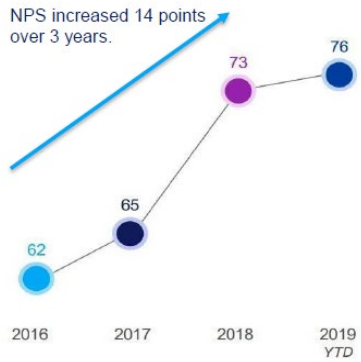
Ongoing Nurse Support (ONS) Information Sheet and Experience Overview

Creating a **Consumer Centric** Personalized Experience of Trust

AARP | Medicare Supplement from UnitedHealthcare

RESULTS: Improved Member Experience

ONS Net Promoter® Score



- Access to a telephonic **dedicated, interdisciplinary team** of nurses, social workers, community health workers and medical staff.
- Trained staff on showing empathy and compassion to our members using Language of Caring
- Tailoring member centric personalized care plan focused on **members' conditions, needs, strengths** and **preferences.**
- Participants are **more confident** in handling unexpected challenges.
- Average participation has ranged from **26,000 – 31,000 per year** due to capped budget.

85%

Participants agree with the question from the assessment: *As a result of this program, I am more confident that I can handle unexpected challenges related to my health and well-being.*

RESULTS: Better Health Outcomes

Engaged were **44% less likely to be placed in long-term care**

Demonstrated Reduction in Cost and Utilization

	Overall	12+ Months in Program
Hospitalizations	45%	77%
Emergency Room	8%	40%
EBM Drug-Disease	8%	18%
Injurious Falls	19%	31%
Mortality	46%	

Overall results compared to members with similar conditions

RESULTS: Increased Affordability

Decreased Health Care Costs

- 8% for those in Hospice
- 15% for those with Depression
- 16% for those with Chronic Kidney Disease

Member results (cohorts) = engaged vs matched qualified but not engaged

Moved to **100% telephonic,** which **reduced PMPM by 25%** from 2016 to 2020

Evaluation shows pockets of success for focus of future work

82.8% Medicare

1.8% Member

15.5% Medigap

Overall Program ROI
1.3:1

12+ Months ROI
7:1

Highest Propensity to Succeed ROI
1.95:1

Source: 2019 UnitedHealthcare Ongoing Nurse Support Evaluation

Geriatric Nursing 000 (2020) 1–7

Contents lists available at ScienceDirect

Geriatric Nursing

journal homepage: www.gnjournal.com

The additive impact of multiple psychosocial protective factors on selected health outcomes among older adults

Shirley Musich, PhD[a,*], Shaohung S. Wang, PhD[a], James A. Schaeffer, RPh[a], Sandra Kraemer, MSW[b], Ellen Wicker, MHA[c], Charlotte S. Yeh, MD[c]

[a] Research for Aging Populations, Optum, 315 E. Eisenhower Parkway, Suite 305, Ann Arbor, MI 48108, USA
[b] Medicare & Retirement, UnitedHealthcare Alliances, PO Box 9472, Minneapolis, MN 55440, USA
[c] AARP Services, Inc., 601 E. Street, N.W., Washington, D.C. 20049, USA

ARTICLE INFO

Article history:
Received 3 August 2020
Received in revised form 14 September 2020
Accepted 16 September 2020
Available online xxx

Key Words:
Older adults
Protective factors
Psychological health outcomes
Physical health outcomes
Healthcare expenditures

ABSTRACT

Our objective was to investigate the additive properties of five psychosocial protective factors: purpose-in-life, resilience, optimism, internal locus of control and social connections. Self-reported psychological (depression, stress) and physical (health status, functionality) health outcomes and measured healthcare utilization and expenditures were included. The study sample was identified from adults age ≥65 who completed a health survey during May-June 2019 (N = 3,577). Each of the five protective factors was dichotomized as high/low (1/0) and counted with equal weighting. The protective factors were additive such that significant improvements in psychological and physical health outcomes were evident across factor subgroups: as the number of factors increased, health outcomes improved. The magnitude of the improvements was greatest between 0 and 1 factor. In addition, a significant linear trend for reduced healthcare expenditures ($1,356 reduction per factor added) was evident. Interventions promoting at least one protective factor would be beneficial for older adult populations.

Introduction

Most older adults have expectations to age well, maintain a high level of well-being and have enhanced quality of life in their later years.[1,2] The scientific understanding of the factors that drive successful aging has changed over time. Initially, the focus was on the importance of managing lifestyle health risks and avoidance of chronic diseases. One of the earliest life span theories, the Compression of Morbidity, proposed and later documented that maintaining healthy lifestyle behaviors, especially in midlife, could delay the onset of disability and disease in later life.[3] More recently, theories for successful aging have expanded from identifying and minimizing additional risk factors to an appreciation of the importance of positive psychological factors that could potentially be health-promoting.[1,2] This positive approach to health focuses on proactive actions (what an individual can do) and protective factors inherent to good health rather than behaviors to be avoided. Along with preventive services compliance and healthy lifestyle behaviors, especially physical activity, there is increasing evidence that specific psychosocial protective factors play a role in maintaining health and functionality over a life span.[1,2] Opinions vary on the relative importance of these various protective factors but those considered as essential often included: purpose-in-life, resilience, optimism, internal locus of control and social connections. Assuming these factors are indeed modifiable, interventions could be designed to promote positive health outcomes among older adults. As hypothesized, each protective factor would serve a unique role in enabling an individual to manage his/her health and meet health challenges as they arise. However, the protective factors should also be synergistic in enhancing an impact on health, such that having more protective factors would provide increased benefits. Thus, the unique role each protective factor plays as it intersects with health and functionality can be considered.

Purpose-in-life is generally conceptualized as having goals, a sense of direction and a feeling that there is meaning to present and past life. Higher purpose-in-life has been associated with better self-rated health,[4] fewer chronic diseases (e.g., stroke,[5] myocardial infarctions[6]), less disability,[7] less dementia and Alzheimer's disease[8] and reduced mortality.[9] In addition, those with higher purpose-in-life are more compliant with preventive services,[10,11] more physically active[12] and more proactive in taking care of personal health.[10,11] These positive health outcomes are associated with fewer emergency room (ER) visits and inpatient (IP) admissions[10,11] and reduced healthcare expenditures.[11] Purpose-in-life is potentially modifiable

*Corresponding author. Tel.: 248-626-0082.
E-mail address: shirley.musich@optum.com (S. Musich).

https://doi.org/10.1016/j.gerinurse.2020.09.007
0197-4572/$ – see front matter

with specific behavioral strategies that help individuals identify meaningful activities, such as community volunteering and engagement in goal-oriented behaviors.[4,5,7,8]

Resilience (i.e., the ability to adapt to changes and cope with life's challenges) has been recognized as a concept central to successful aging. Resilience is associated with promoting recovery from negative stressors, reducing depression and improving perceived health status over time.[13–21] As currently interpreted, resilience is operational when an individual is exposed to stressors or trauma.[21] Resilience is influenced by internal factors including personality traits (e.g., optimism) and beliefs (e.g., self-efficacy) and external factors, such as social connections and material resources.[21] Higher resilience has been associated with maintaining positive mental health (i.e., less depression and anxiety) despite stressors or trauma[13–19] while a direct impact of resilience on physical health outcomes, such as physical activity, physical function, recovery from surgery and pain outcomes, has been less consistent.[14,16–20] Most consider resilience amenable to change regardless of age and suggest that strategies to promote resilience be incorporated into physical rehabilitation, stress management and successful aging programming.[13,14,19,21]

Dispositional optimism has been conceptualized with two dissimilar metrics, optimism and pessimism, combined to provide a measure of an individual's expectancy of positive outcomes for future events.[22–31] Higher optimism has been associated with improved lifestyle health behaviors,[24,26–28] less depression and more positive emotions,[23,24,27] increased physical functioning,[29] lower stress,[22,25] better self-reported health status[25,27,28] and lower cardiovascular and all-cause mortality.[26,27,31] The impact of optimism on health outcomes may be mediated by either internal locus of control and/or social support rather than having a direct impact on a specific health outcome.[22,23,30] Optimism is generally characterized with personality trait-like qualities and is stable over time; thus, while change is possible with interventions, optimism may not be as easily influenced as other protective factors.[24,25,27,29]

Internal locus of control (LOC) refers to one's perception of the level of control an individual has over his/her health/life.[32] High internal LOC has been associated with lower pain severity,[33,34] better physical functionality,[33–36] higher self-reported health status,[33,37] lower cardiovascular and mortality risk[35,38] and better quality of life.[33] A person's LOC can have ramifications on specific or general health behaviors.[35,36,39,40] Those with high internal scores tend to be motivated to take proactive voluntary actions to manage their health by participating in healthy lifestyle behaviors, especially physical activity,[35,36,39,40] using more preventive services[35] and tend to be more responsive to treatment protocols (e.g., rehabilitation).[35] LOC, as defined, is considered a psychological characteristic and has been shown to be modifiable given suitable interventions that focus on increasing self-efficacy, skill-building, self-empowerment and goal-management.[35,37,41]

Finally, social connectedness is generally measured as perceived social support evaluating the individual's perception of support whether realized or not.[42,43] More recently, a more quantitative approach to social networks has been designed as a "count" metric for various types of social experiences with more diverse networks across types of social contacts conceived as being more stable and thus more protective.[43,44] Regardless of the specific measure, however, perceived social support, social participation or diverse social networks have demonstrated a protective effect on pain severity,[42] functional abilities,[42] mental health,[43–45] self-reported health status[44,46] and mortality.[45] Robust social networks appear to buffer biological reactivity to stressful events[43] and are health promoting either through better adherence to healthier behaviors[47] and compliance with medical regimens[42] or through minimizing psychological processes, such as depression.[43–45] Historically, interventions to increase social connections within populations have experienced limited success, although there is some evidence that physical activity programs may be effective.[48] Additionally, volunteering in group settings or use of social networking technology may provide additional opportunities.[46]

Most research studies consider these protective factors separately or among two or three factors in mediation studies. We found only one study (Lachman et al.)[36] that focused on the additive benefits of combinations of protective factors. In this study, three factors were included—control beliefs, social support and physical activity.[36] This approach is parallel to a considerable body of research using "counted" health risks and documenting that as the number of health risks that an individual has increases, so too do the negative health outcomes, including increased healthcare expenditures.[49–51] This risk/cost relationship implies that the combinations of health risks provide a unique contribution to health outcomes regardless of the specific individual health risks. In Lachman et al.'s study,[36] a linearly increased benefit was documented for combinations of control beliefs, social support and physical activity: as the number of these factors an individual possessed increased (zero, one, two or three), an incremental improvement in functional health with each additional factor was observed. Consequently, it was of interest to understand if this concept of additive benefits could be extended to include the five psychosocial protective factors defined in this study.

Our expectation was that the combinations of these protective factors would provide increasing benefits on the various psychological and physical health outcomes and that the impact of these combinations of factors on health outcomes would be reflected in reduced healthcare utilization and expenditures.

Thus, our objective was to examine the additive properties associated with psychosocial protective factor subgroups ranging from 0 to 5. These factors included purpose-in-life, resilience, optimism, internal LOC and social connections dichotomized as high/low and counted as 1/0. The relative impacts of the subgroups were tested on selected self-reported psychological (depression, perceived stress) and physical (health status, functionality) health outcomes and measured healthcare utilization and expenditures. This research was covered under the New England IRB #120160532.

Methods

Study Sample

In 2016, approximately 5 million Medicare beneficiaries were covered by an AARP® Medicare Supplement Insurance Plan from UnitedHealthcare.[52] These plans are offered in all 50 states, Washington DC and various US territories. AARP Medicare Supplement insureds at least 65 years of age with a minimum of 12-month continuous medical plan enrollment were used to generate a randomly selected sample mailing list for the health survey. A mailing list of 16,200 was drawn from eligible insureds. Of survey respondents (3,976; 25% response rate), those missing survey values on the five protective factor scales (N = 252) or on self-reported health outcomes (N = 151) were excluded. Thus, the final study sample included 3,573 survey respondents.

Survey

The mailed survey (69 questions) was developed by UnitedHealthcare to assess various aspects of health associated with older adults. The survey included validated scales for five psychosocial protective factors: purpose-in-life, resilience, optimism, internal LOC and social connections. Other questions focused on self-reported health status, depression, perceived stress and functionality. The survey was mailed with a 2-month window to the stratified sample in

May 2019 with a repeat mailing in June 2019 to those who had not yet responded.

Psychosocial Protective Factors

Purpose-in-life was measured using six items adapted from the Life Engagement Test.[53] Responses were scored and averaged across the questions to give a range of scores from 1 to 5. Purpose-in-life was then dichotomized as follows: high (scores ≥ 4; responses agree or strongly agree) and low (scores 1–3).

Resilience was measured using the 6-item Brief Resilience Scale.[54] Responses were scored and averaged across the questions to give a range of scores from 1 to 5. Resilience was then dichotomized: high (scores 4–5; responses agree and strongly agree) and low (scores 1–3).

Dispositional optimism was measured using the 6-item Revised Life-Orientation Test (LOT-R).[55,56] Responses were scored from 0 to 4 on items 1, 3 and 6 and reverse coded for items 2, 4 and 5, and then summed to a total score. Using the total score distribution, high optimism was defined as top 25% percentile of scores and low optimism as the bottom 75%.

Internal health LOC was measured using Wallston's Multidimensional Health Locus of Control (MHLC) scale.[32] The 6-level responses were scored 1 to 6 and averaged across the questions to give a range of scores from 1 to 6. Based on the distribution of the average score, high internal LOC was defined as the top 30th percentile of scores and low internal LOC as the bottom 70%. Although Wallston's scale additionally includes two external LOC dimensions identified as powerful other (typically physicians) and chance, only the internal dimension was utilized in this analysis.

Social connections were measured using the Social Network Index, an objective count of the number of contacts across 4 different types of social connectedness: talking to friends, family or neighbors on the telephone per week; getting together with friends or relatives per week; attending church or religious services per month; attending meeting of clubs or organizations per month.[45] Responses were scored 0 to 3 for the social connections count ranges and 0 or 1 for a yes/no married question for a total score of 0 to 13. Social connections were categorized as high if scores ranged from 8–13 and low if < 8.

Protective Factor Subgroups

Each dichotomized protective factor was then scored as 1 if high and 0 if low. The number of protective factors was assessed with equal weighting for each individual and subsequently categorized by the total number of factors possessed by that individual: 0, 1, 2, 3, 4 and 5 factors. Since the sample size for the 5 factors subgroup was small (3%), subgroups 4 and 5 were combined for regression adjustments or regression modeling.

Self-Reported Health Outcomes

Depression was measured using the self-reported Patient Health Quesionnaire-2 (PHQ-2).[57] The 4-level responses were scored 0 to 3 for a total score range of 0 to 6. The score was then dichotomized as 0–2 (not depressed) and 3–6 (depressed). Perceived stress was measured using the 4-item Cohen perceived stress scale (PSS-4).[58] Questions 1 and 4 were scored 0 to 4 and questions 2 and 3 were reverse scored. Responses were averaged across the questions for a total score of 0 to 4. Average responses were then dichotomized as low stress (scores 0–1; never or almost never) and high stress (scores 2–4; sometimes/fairly often/very often).

Self-rated health status and physical functional ability was assessed from the Veterans Rand-12 (VR-12)[59] quality of life questions. Self-rated health used the question "In general, would you say your health is: excellent, very good, good, fair or poor?" Self-rated health was subsequently dichotomized as fair/poor vs. excellent/very good/good. Functional ability was assessed with the VR-12 question regarding how much health limits the ability for 1) moderate activities, such as bowling or playing golf, or 2) climbing several flights of stairs. The combined questions were dichotomized as limited (limited a lot on either question) and not limited (limited a little or not limited).

Healthcare Utilization and Expenditures

Healthcare utilization was defined from administrative medical claims as IP admissions or ER visits within the one-year pre-survey May 2018-May 2019. Healthcare expenditures were defined as paid medical claims from the same time period aggregated from Medicare, Medicare Supplement and patient out-of-pocket paid amounts. Results were reported as the annual rate of IP admissions or ER visits and the annual total of medical expenditures calculated across the protective factor subgroups 0,1, 2, 3, and 4/5.

Covariates

Covariates utilized in regression adjustments of prevalence, multivariate logistic regression and linear regression models included measures of demographics, socioeconomic factors and health status.

Demographic questions included age and gender. Age groups were defined as: 65–69; 70–74; 75–79; 80–84; and ≥85 years. Geographical location (Northeast, South, Midwest or West); and low (<$40,179), medium ($40,179 to <$57,199) and high (≥$57,199) median household income levels were geocoded from zip codes as determined by the US Census Bureau. AARP Medicare Supplement plan types were grouped by cost-sharing levels, including high-level coverage plans with minimal copayments or deductibles; least comprehensive plans with relatively more copayments or deductibles; and all other plans. Two measures of health services access were calculated as primary care physicians (PCPs) per 100,000 capita and acute care hospital beds per 100,000 capita. Level of medical services utilization from medical claims was calculated as the Hierarchical Condition Category (HCC) score.[60] This score is used by the Centers for Medicare & Medicaid Services (CMS) to risk adjust medical payments across various medical plans according to the health status of the different insured populations. HCC subgroups were defined as follows and utilized to control for health status: HCC scores < 0.5 (healthy and active); HCC scores 0.5 to < 1.2 (above average); HCC scores 1.2 to < 2.8; (at risk) and HCC scores ≥ 2.8 (very sick).

Statistics

Weighting to Adjust for Survey Non-response Bias

Propensity weighting was used to adjust for potential selection bias often associated with survey response to enhance the generalizability of these findings. The propensity weighting utilized available information about the demographic, socioeconomic and health status variables described above that could potentially influence survey response.[61,62]

Demographics and Regression Models

Demographic variables were unilaterally tested across the protective factor subgroups (0, 1, 2, 3, 4 and 5) using chi-square or t-tests for categorical or continuous variables, respectively. Prevalence rates for health outcomes by number of protective factor subgroups (0, 1, 2, 3 and 4/5) were regression-adjusted using demographic, socioeconomic and health status variables listed in Table 1.

Table 1
Unadjusted Demographic Characteristics by Number of Protective Factors

	All	Number of Protective Factors						p-value
		0	1	2	3	4	5	
Number	3,573	756	788	801	679	445	104	
Gender								
Female	54.0	54.6	53.4	52.8	56.4	51.9	56.7	0.64
Male	46.0	45.4	46.6	47.2	43.6	48.1	43.3	
Age Group								
65-69	15.9	11.6	13.7	18.6	15.5	21.6	22.1	<0.0001
70-74	26.3	22.9	23.5	27.1	29.8	28.1	34.6	
75-79	21.5	17.2	21.3	21.5	25.8	22.5	22.1	
80-85	18.5	20.8	20.6	18.1	16.8	15.3	14.4	
≥85	17.8	27.5	20.9	14.7	12.2	12.6	6.7	
Median Income (from zipcode)								
Low	14.6	15.3	15.2	15.1	14.7	12.6	9.6	0.61
Medium	36.9	35.6	37.8	38.6	34.9	37.1	40.4	
High	48.3	48.7	46.7	46.2	50.4	50.3	50.0	
Region								
Midwest	19.6	20.0	22.5	18.0	18.7	19.1	14.4	0.35
Northeast	24.7	25.7	24.8	25.3	26.2	21.1	19.2	
South	34.6	34.1	34.0	35.2	33.9	35.5	39.4	
West	21.0	20.2	18.7	21.5	21.2	24.3	26.9	
Healthcare access								
Acute hospital beds per 100,000	229.5	227.9	233.1	232.3	227.1	226.4	221.5	0.33
PCP per 100,000	133.0	134.9	134.0	133.2	131.5	131.1	128.5	0.23
Plan type coverage								
High	69.5	66.5	67.5	70.5	73.1	71.2	69.2	0.05
Least comprehensive	5.5	6.8	7.1	4.6	5.0	3.4	3.9	
Other	24.9	26.7	25.4	24.8	21.9	25.4	26.9	
Internal LOC								
High (score ≥4.67)	28.1	0.0	13.2	26.5	40.7	69.2	100.0	<0.0001
Optimism								
High (score ≥22)	26.3	0.0	3.7	14.6	47.0	82.9	100.0	<0.0001
Purpose-in-life								
High (score ≥4)	64.3	0.0	54.7	82.8	96.5	100.0	100.0	<0.0001
Resilience								
High (score ≥4)	43.3	0.0	14.0	48.6	77.5	94.2	100.0	<0.0001
Social connections								
Diverse (score ≥8)	26.3	0.0	14.5	27.6	38.4	53.7	100.0	<0.0001
HCC Score								
<0.50	22.2	14.0	16.2	25.5	25.9	32.1	35.6	<0.0001
0.50 to <1.20	45.1	39.6	48.1	44.8	47.6	45.4	46.2	
1.20 to <2.80	26.2	36.5	27.9	24.3	21.7	18.7	14.4	
≥2.8	6.5	9.9	7.7	5.4	4.9	3.8	3.9	

Notes: PCP = primary care physician; HCC=Hierarchical Condition Category: LOC = locus of control.

Multivariate logistic regression models were used to test the impact of the protective factor subgroups on psychological (depression and perceived stress) and physical (self-reported health status and functionality) health outcomes adjusting for demographic, socioeconomic and health status variables.

Annual healthcare IP admission and ER visit utilization rates and medical expenditures were regression-adjusted using demographic and socioeconomic variables. All analyses were completed using SAS Enterprise Guide Version 7.12 (SAS Institute Inc., Cary, NC, USA).

Results

Overall, 3,976 AARP Medicare Supplement insureds responded to the survey (25% response rate). Of these, 90% (N = 3,573) met the eligibility criteria and were included in the study. Survey respondents were mostly female, 70–74 or 75–79 years of age, lived in the South and had high coverage insurance plans. The population prevalence of the five high protective factors were: purpose-in-life (64%), resilience (43%), optimism (26%), internal LOC (28%) and social connections (26%). (Table 1) The prevalence of the psychosocial protective factor subgroups was as follows: 21%, 22%, 22%, 19%, 12% and 3% for 0, 1, 2, 3, 4 and 5 factors, respectively. In unadjusted demographics, those with fewer factors (0 or 1 factor) were older (≥80 years) and in poorer health (HCC Score ≥ 1.20; at risk or very sick). There were no significant differences across the subgroups for gender, income level, region of the country or healthcare access.

Significant trends were evident across the protective factor subgroups for each of the self-reported psychological and physical health outcomes: depression, stress, health status and functionality. (Table 2) The prevalence of depression was decreased by almost two-thirds by having 1 factor compared to those with 0 factors; the prevalence was further reduced by an additional two-thirds with 2 factors; those with 5 factors had almost no evidence of depression (<1%). Perceived stress demonstrated a significant linear reduction of about 17 percentage points per protective factor added. The prevalence of fair/poor self-reported health status was reduced by about 40% with 1 factor compared to 0 factors and by another 10% with 2 factors. Functionality was less impacted with severe limitations reduced by 30% with 1 factor and another 13% with 2 factors. The magnitude of the health improvements, regardless of health outcome, was greatest between 0 and 1 factors; however, as the number of factors increased, health outcomes consistently improved. Likewise, adjusted odds ratios associated with psychological and physical health outcomes demonstrated the greatest reduction in negative health outcomes between 0 factors and 1 factor with continued health improvements evident as the number of protective factors increased. (Table 2)

Table 2
Self-Reported Psychological and Physical Health Outcomes by Number of Protective Factors

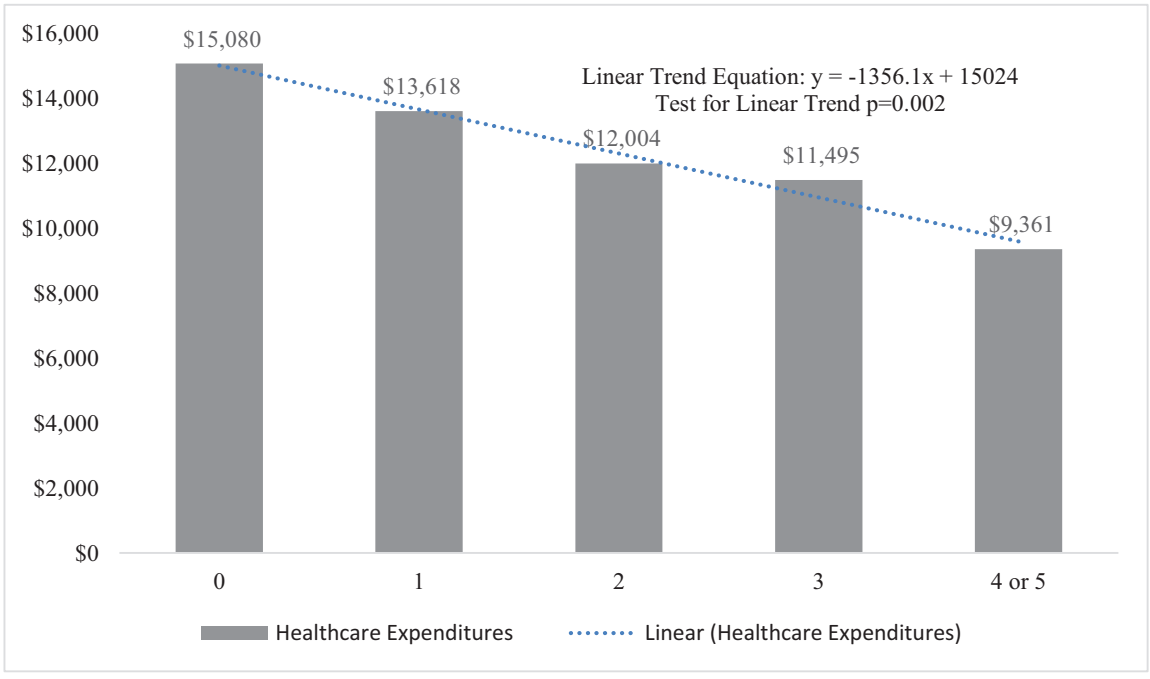
Self-Reported Health Outcome	Number of Protective Factors					Test for Trend p-value
	0	1	2	3	4/5	
Depression (PHQ-2)						
Unadjusted prevalence (%)	25.7	9.6	3.4	1.5	0.4	
Adjusted prevalence (%)	23.8	9.4	3.5	1.4	0.4	0.04
Odds Ratios*	Reference	0.32	0.11	0.04	0.01	
Perceived Stress (high/medium)						
Unadjusted prevalence (%)	75.1	51.7	33.2	16.6	6.9	
Adjusted prevalence (%)	73.8	51.8	33.7	17.3	7.1	0.0009
Odds Ratios*	Reference	0.38	0.18	0.07	0.03	
Health Status (fair/poor)						
Unadjusted prevalence (%)	32.8	17.3	11.9	6.5	2.6	
Adjusted prevalence (%)	28.4	16.8	13.2	7.3	3.7	0.005
Odds Ratios*	Reference	0.45	0.32	0.16	0.07	
Functionality (limited a lot)						
Unadjusted prevalence (%)	46.3	29.6	21.5	20.6	12.4	
Adjusted prevalence (%)	40.2	28.4	23.0	22.9	15.8	0.02
Odds Ratios*	Reference	0.54	0.4	0.39	0.24	

Notes: Adjusted for age, gender, income, region, plan type, healthcare access, and health status. PHQ-2 = Patient Health Questionnaire-2.
* All values significantly different from 0 factors $p < 0.001$.

Associated with improved psychological and physical health outcomes, significant reductions in healthcare utilization and expenditures were also evident. Utilization of ER visits and IP admissions were reduced as the number of protective factors increased. (Table 3; Fig. 1) Notably, there was a significant linear trend associated with reduced healthcare expenditures such that a $1,356 reduction per factor added was demonstrated.

Discussion

In this sample of AARP Medicare Supplement insureds, the weighted prevalence of the psychosocial protective factor subgroups was: 21%, 22%, 22%, 19%, 12% and 3% for 0, 1, 2, 3, 4 and 5 factors, respectively. Of note, in this population, 21% had 0 protective factors. This subgroup consistently was at highest risk for depression, stress, fair/poor health and functional limitations. As hypothesized, the impacts of the protective factor subgroups were additive on the selected health outcomes. We investigated the additive properties for any 3 or any 4 of the 5 factors with similar results (not shown). Beyond 1 factor, the decreasing trends were similar regardless of which 3 or 4 factors were included. From these results, we concluded that apparently no specific factor was more important than any other; however, any additional factor improved the selected health outcomes. Furthermore, despite varying levels of overlap between the individual factors (correlations ranging from 0.05 to 0.40), each factor independently contributed to increased benefits. Although the



Notes: Healthcare expenditures include medical claims paid by plans and co-pays by patients. Expenditures are adjusted for age, gender, income, region, plan type and access to healthcare.

Fig. 1. Adjusted Healthcare Expenditures by Number of Protective Factors.

Table 3
Healthcare Utilization and Expenditures by Number of Protective Factors

Self-Reported Health Outcome	Number of Protective Factors					Test for Trend p-value
	0	1	2	3	4/5	
Emergency Room Visits						
Unadjusted prevalence (%)	35.4	30.3	30.3	29.4	26	
Adjusted prevalence (%)	34.8	30.1	30.6	29.6	26.4	0.04
Inpatient Admissions						
Unadjusted prevalence (%)	19.2	15.0	10.0	12.9	8.9	
Adjusted prevalence (%)	18.4	14.7	10.1	13.2	9.4	0.07
Medical Expenditures						
Unadjusted annual expenditures ($)	15,122	13,602	11,899	11,709	9,190	
Adjusted annual expenditures ($)	15,080	13,618	12,004	11,495	9,361	0.002

Notes: Adjusted for age, gender, income, region, plan type and healthcare access. *All values significantly different from 0 factors $p<0.001$.

protective factors measured were different, our results were consistent with results demonstrated by Lachman et al.[36] in that the incremental improvements in functionality in that study were evident across any 1 or any 2 of the 3 factors studied. It may be that different protective factors feature more predominantly at different times given the health needs of the individual; thus, all are important and needed in managing one's health over time.

There were significant trends across the subgroups such that as the number of protective factors increased, both psychological and physical health outcomes incrementally improved. Depression was the most dramatically reduced; among those with all five factors, the prevalence of depression was less than 1%. In contrast, stress was linearly decreased in increments of about 17 percentage points per factor added. The additive impacts of the protective factors on self-reported health and functionality were somewhat less; nevertheless, adding 1 factor reduced fair/poor health by about 40% and reduced functional limitations by about 30% compared to having 0 factors. The differences in health outcomes were most evident between 0 factors and 1 factor. The decreases between 1 and 2 factors were somewhat less but notable. The decreases in negative health outcomes with 3, 4 or 5 factors were consistent but with incrementally diminishing impacts. Nevertheless, adding any additional factor resulted in improved health outcomes.

Associated with the robust trends observed across the self-reported psychological and physical health outcomes, significant reductions in measured healthcare utilization and expenditures were evident. A significant linear reduced trend in healthcare expenditures ($1,356 per factor added) was documented. Decreasing trends for ER visits and IP admissions with increasing protective factors were also evident. Social science research seldom includes healthcare expenditure outcomes; we found no studies that considered an association between healthcare expenditures and combinations of protective factors. Two published studies did demonstrate a link between a specific protective factor and healthcare utilization or expenditures.[10,33] These studies both utilized survey results: higher self-efficacy and internal LOC were associated with lower self-reported arthritis-related healthcare utilization and expenditures[33] and higher purpose-in-life was associated with fewer self-reported nights spent in a hospital.[10] The demonstrated robust linear trend of reduced healthcare expenditures with increased protective factors could potentially provide a business case for the development of more interventions targeting protective factors, especially among those with 0 factors.[49,50] Additionally, although protective factors are generally stable over time, frequencies would be expected to decrease with age and/or declining health.[4,19,25,27,36,45] Thus, strategies for maintaining existing protective factors over time will be needed to maximize the health needs of a given population over time. Future longitudinal research will be needed to test the hypothesis if changes in protective factors over time are associated with changes in healthcare expenditures.[51]

Amenability to change varies across the five factors, although there are indications that all can be influenced to some extent. Internal LOC has been shown to be modifiable in interventions that include increasing self-efficacy and skill-building.[35,37,41] There is evidence that purpose-in-life is modifiable with specific behavioral strategies that help individuals engage in meaningful activities.[4,5,7,8] The objective measure of social networks has shown improvement with programs that encourage social interactions, such as physical activity programs, volunteering and online social groups.[46,48] Less focus has been devoted to resilience and optimism interventions, although most consider even these amenable to change.[19,24,25,27,29] More research and better intervention designs are needed to effectively increase or maintain these protective factors over time, especially during times of personal or national health crises.

This study has limitations. The study sample of AARP Medicare Supplement insureds may differ in demographic, socioeconomic or health status characteristics from general older adult and/or specifically overall Medicare populations and, consequently, the results may not generalize to these other populations. The five protective factors and the psychological and physical health outcomes were self-reported and may be subject to bias. This is a cross-sectional study thus the directionality of the associations of protective factors and health outcomes cannot be assumed, although generally protective factors are thought to precede or be concurrent with designated health outcomes. Strengths of the study include a relatively large study sample with survey responses and administrative medical utilization and expenditure variables that could be tested in multivariate regression models.

Conclusions

Overall, in this sample of Medicare Supplement insureds, the subgroups of five combined protective factors were evenly distributed with about 20% in each subgroup. No specific protective factor was apparently more important than any other; the addition of any factor was associated with incrementally improved health outcomes. The group with 0 factors was at highest risk across all health outcomes and incurred the highest level of healthcare utilization and expenditures. Interventions that would increase protective factors, especially among those with 0 factors, or help in maintaining these factors as individuals age or health declines, would benefit older adults in maximizing their health potential and enhancing quality of life as they age.

Declaration of Competing Interest

This work was funded by the AARP Medicare Supplement Insurance Program. Shirley Musich, Shaohung S. Wang, James Schaeffer, and Sandra Kraemer are all employed by UnitedHealth Group and have stock with UnitedHealth Group. Ellen Wicker and Charlotte S.

Yeh are employed by AARP Services, Inc. However, their compensation was not dependent upon the results obtained in this research, and the investigators retained full independence in the conduct of this research. This research did not receive any specific grant or grant number from funding agencies.

References

1. Ryff CD, Singer B. The contours of positive human health. *Psychol Inq*. 1998;9:1–28.
2. Bowling A, Iliffe S. Psychological approach to successful ageing predicts future quality of life in older adults. *Health Qual Life Outcomes*. 2011;9:13.
3. Fries JF. Aging, natural death, and the compression of morbidity. *New Engl J Med*. 1980;303:245–250.
4. Pinquart M. Creating and maintaining purpose in life in old age: a meta-analysis. *Ageing Int*. 2002;27:90–114.
5. Kim ES, Sun JK, Park N, Peterson C. Purpose in life and reduced incidence of stroke in older adults: 'the health and retirement study'. *J Psychosom Res*. 2013;74:427–432.
6. Kim ES, Sun JK, Park N, Kubzansky LD, Peterson C. Purpose in life and reduced risk of myocardial infarction among older U.S. adults with coronary heart disease: a two-year follow-up. *J Behav Med*. 2013;36:124–133.
7. Boyle PA, Buchman AS, Bennett DA. Purpose in life is associated with a reduced risk of incident disability among community-dwelling older persons. *Am J Geriatr Psychiatry*. 2010;18:1093–1102.
8. Boyle PA, Buchman AS, Barnes LL, Bennett DA. Effect of a purpose in life on risk of incident Alzheimer disease and mild cognitive impairment in community-dwelling older persons. *Arch Gen Psychiatry*. 2010;67(3):304–310.
9. Boyle PA, Barnes LL, Buchman AS, Bennett DA. Purpose in life is associated with mortality among community-dwelling older persons. *Psychosom Med*. 2009;71:574–579.
10. Kim ES, Strecher VJ, Ryff CD. Purpose in life and use of preventive health care services. *Proc Natl Acad Sci U S A*. 2014;111:16331–16336.
11. Musich S, Wang SS, Kraemer S, Hawkins K, Wicker E. Purpose in life and positive health outcomes among older adults. *Popul Health Manag*. 2018;21(2):139–147.
12. Hooker SA, Masters KS. Purpose in life is associated with physical activity measured by accelerometer. *J Health Psychol*. 2016;21:962–971.
13. Byun J, Jung D. The influence of daily stress and resilience on successful ageing. *Int Nurs Rev*. 2016;63:482–489.
14. Moore RC, Eyler LT, Mausbach BT, et al. Complex interplay between health and successful aging: role of perceived stress, resilience, and social support. *Am J Geriatr Psychiatry*. 2015;23:622–632.
15. Ong AD, Bergeman CS, Bisconti TL, Wallace KA. Psychological resilience, positive emotions, and successful adaptation to stress in later life. *J Pers Soc Psychol*. 2006;91(4):730–749.
16. Schure MB, Odden M, Goins RT. The association of resilience with mental and physical health among older American Indians: the native elder care study. *Am Indian Alsk Native Ment Health Res*. 2013;20(2):27–41.
17. Battalio SL, Tang CL, Jensen MP. Resilience and function in adults with chronic physical disabilities: a cross-lagged panel design. *Ann Behav Med*. 2020;54(5):297–307.
18. Matzka M, Mayer H, Köck-Hódi S, et al. Relationship between resilience, psychological distress and physical activity in cancer patients: a cross-sectional observation study. *PLoS One*. 2016;11:(4) e0154496.
19. Edwards KA, Alschuler KA, Ehde DM, Battalio SL, Jensen MP. Changes in resilience predict function in adults with physical disabilities: a longitudinal study. *Arch Phys Med Rehabil*. 2017;98(2):329–336.
20. Lim KK, Matchar DB, Tan CS, et al. The association between psychological resilience and physical function among older adults with hip fracture surgery. *J Am Med Dir Assoc*. 2020;21(2):260–266.
21. Chmitorz A, Kunzler A, Helmreich I, et al. Intervention studies to foster resilience - A systematic review and proposal for a resilience framework in future intervention studies. *Clin Psychol Rev*. 2018;59:78–100.
22. Bretherton SJ, McLean LA. Interrelations of stress, optimism and control in older people's psychological adjustment. *Australas J Ageing*. 2015;34(2):103–108.
23. Marshall GN, Lang EL. Optimism, self-mastery, and symptoms of depression in women professionals. *J Pers Soc Psychol*. 1990;59(1):132–139.
24. Carver CS, Scheier MF. Dispositional optimism. *Trends Cogn Sci*. 2014;18(6):293–299.
25. Smith N, Young A, Lee C. Optimism, health-related hardiness and well-being among older Australian women. *J Health Psychol*. 2004;9(6):741–752.
26. Anthony EG, Kritz-Silverstein D, Barrett-Connor E. Optimism and mortality in older men and women: the Rancho Bernardo study. *J Aging Res*. 2016;2016: 5185104.
27. Giltay EJ, Kamphuis MH, Kalmijn S, Zitman FG, Kromhout D. Dispositional optimism and the risk of cardiovascular death: the Zutphen Elderly Study. *Arch Intern Med*. 2006;166(4):431–436.
28. Steptoe A, Wright C, Kunz-Ebrecht SR, Iliffe S. Dispositional optimism and health behaviour in community-dwelling older people: associations with healthy ageing. *Br J Health Psychol*. 2006;11(Pt 1):71–84.
29. Brenes GA, Rapp SR, Rejeski WJ, Miller ME. Do optimism and pessimism predict physical functioning? *J Behav Med*. 2002;25(3):219–231.
30. Ferguson SJ, Goodwin AD. Optimism and well-being in older adults: the mediating role of social support and perceived control. *Int J Aging Hum Dev*. 2010;71(1):43–68.
31. Rozanski A, Bavishi C, Kubzansky LD, Cohen R. Association of optimism with cardiovascular events and all-cause mortality: a systematic review and meta-analysis. *JAMA Netw Open*. 2019;2:(9) e1912200.
32. Wallston KA, Stein MJ, Smith CA. Form C of the MHLC scales: a condition-specific measure of locus of control. *J Pers Assess*. 1994;63(3):534–553.
33. Cross MJ, March LM, Lapsley HM, Byrne E, Brooks PM. Patient self-efficacy and health locus of control: relationships with health status and arthritis-related expenditure. *Rheumatology (Oxford)*. 2006;45(1):92–96.
34. Keedy NH, Keffala VJ, Altmaier EM, Chen JJ. Health locus of control and self-efficacy predict back pain rehabilitation outcomes. *Iowa Orthop J*. 2014;34:158–165.
35. Infurna FJ, Gerstorf D. Perceived control relates to better functional health and lower cardio-metabolic risk: the mediating role of physical activity. *Health Psychol*. 2014;33(1):85–94.
36. Lachman ME, Agrigoroaei S. Promoting functional health in midlife and old age: long-term protective effects of control beliefs, social support, and physical exercise. *PLoS One*. 2010;5(10):e13297.
37. Zhang A, Jang Y. The role of internal health locus of control in relation to self-rated health in older adults. *J Gerontol Soc Work*. 2017;60(1):68–78.
38. Duan-Porter W, Hastings SN, Neelon B, Van Houtven CH. Control beliefs and risk for 4-year mortality in older adults: a prospective cohort study. *BMC Geriatr*. 2017;17(1):13.
39. Mercer DA, Ditto B, Lavoie KL, Campbell T, Arsenault A, Bacon SL. Health locus of control is associated with physical activity and other health behaviors in cardiac patients. *J Cardiopulm Rehabil Prev*. 2018;38(6):394–399.
40. Robinson SA, Lachman ME. Perceived control and cognition in adulthood: The mediating role of physical activity. *Psychol Aging*. 2018 Aug;33(5):769–781.
41. Dulin PL, Hanson BL, King DK. Perceived control as a longitudinal moderator of late-life stressors on depressive symptoms. *Aging Ment Health*. 2013;17(6):718–723.
42. Lopez-Olivo MA, Landon GC, Siff SJ, et al. Psychosocial determinants of outcomes in knee replacement. *Ann Rheum Dis*. 2011;70(10):1775–1781.
43. Uchino BN, Kent de Grey RG, Cronan S. The quality of social networks predicts age-related changes in cardiovascular reactivity to stress. *Psychol Aging*. 2016;31(4):321–326.
44. Aung MN, Moolphate S, Aung TN, Katonyoo C, Khamchai S, Wannakrairot P. The social network index and its relation to later-life depression among the elderly aged ≥80 years in Northern Thailand. *Clin Interv Aging*. 2016;11:1067–1074.
45. Pantell M, Rehkopf D, Jutte D, Syme SL, Balmes J, Adler N. Social isolation: a predictor of mortality comparable to traditional clinical risk factors. *Am J Public Health*. 2013;103(11):2056–2062.
46. Coyle CE, Dugan E. Social isolation, loneliness and health among older adults. *J Aging Health*. 2012;24(8):1346–1363.
47. Kobayashi LC, Steptoe A. Social isolation, loneliness, and health behaviors at older ages: longitudinal cohort study. *Ann Behav Med*. 2018;52(7):582–593.
48. Brady S, D'Ambrosio LA, Felts A, Rula EY, Kell KP, Coughlin JF. Reducing isolation and loneliness through membership in a fitness program for older adults: implications for health. *J Appl Gerontol*. 2020;39(3):301–310.
49. White J, Hartley SK, Musich S, Hawkins K, Ozminkowski RJ. A more generalizable method to evaluate the association between commonly reported health risks and health care expenditures among employers of all sizes. *J Occup Environ Med*. 2013 Oct;55(10):1179–1185.
50. Goetzel RZ, Carls GS, Wang S, et al. The relationship between modifiable health risk factors and medical expenditures, absenteeism, short-term disability, and presenteeism among employees at novartis. *J Occup Environ Med*. 2009;51(4):487–499.
51. Musich S, White J, Hartley SK, Bhattarai GR, Hawkins K, Ozminkowski RJ. A more generalizable method to evaluate changes in health care costs with changes in health risks among employers of all sizes. *Popul Health Manag*. 2014;17(5):297–305.
52. AHIP Center for Policy and Research. Trends in Medigap enrollment and coverage options, 2015. Retrieved October 8, 2018 from: https://www.ahip.org/wp-content/uploads/2017/05/Medigap_Report_5.1.17.pdf.
53. Scheier MF, Wrosch C, Baum A, et al. The life engagement test: assessing purpose in life. *J Behav Med*. 2006;29(3):291–298.
54. Smith BW, Dalen J, Wiggins K, Tooley E, Christopher P, Bernard J. The brief resilience scale: assessing the ability to bounce back. *Int J Behav Med*. 2008;15:194–200.
55. Carver C.S.Life orientation test-revised (LOT-R). Meas. Instrum. Database Soc. Sci.. Retrieved from www.midss.ie.
56. Scheier MF, Carver CS, Bridges MW. Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self-esteem): a reevaluation of the Life Orientation Test. *J Pers Soc Psychol*. 1994;67(6):1063–1078.
57. Kroenke K, Spitzer RL, Williams JB. The patient health questionnaire-2: validity of a two-item depression screener. *Med Care*. 2003;41(11):1284–1292.
58. Cohen S, Kamarck T, Mermelstein R. A global measure of perceived stress. *J Health Soc Behav*. 1983 Dec;24(4):385–396.
59. Selim AJ, Rogers W, Fleishman JA, et al. Updated US population standard for the Veterans RAND 12-item health survey (VR-12). *Qual Life Res*. 2009;18:43–52.
60. Pope GC, Kautter J, Ingber MJ, Freeman S, Sekar R, Newhart C. Evaluation of the CMS-HCC Risk Adjustment Model, 2011. Retrieved March 3, 2017 from: https://www.cms.gov/Medicare/Health-Plans/MedicareAdvtgSpecRateStats/downloads/evaluation_risk_adj_model_2011.pdf.
61. Fairies DEL, Haro JM, Obenchain RL, Leon AC. *Analysis of Observational Healthcare Data Using SAS*. Cary, NC, USA: SAS Institute, Inc.; 2010.
62. Seeger JD, Williams PL, Walker AM. An application of propensity score matching using claims data. *Pharmacoepidemiol Drug Saf*. 2005;14:465–476.