TECHNICAL APPENDICES

FIRST EVALUATION REPORT

Evaluation of the Vermont All-Payer Accountable Care Organization Model

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PRESENTED TO:
Franklin Hendrick
Center for Medicare & Medicaid Innovation
Centers for Medicare & Medicaid Services
7500 Security Boulevard
Baltimore, MD 21244

PRESENTED BY:
Sai Loganathan
Project Director
NORC at the University of Chicago
4350 East-West Hwy, Suite 800
Bethesda, MD 20814
301-634-9488

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NORC at the University of Chicago

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Appendix A. Glossary of Acronyms

Appendix Exhibit A: Glossary of Acronyms

Acronym	Definition
ACO	Accountable Care Organization
ACH	Accountable Communities for Health
AHS	Vermont Agency for Human Services
AIPBP	All-inclusive population-based payment
BCBSVT	Blue Cross Blue Shield of Vermont
BY	Baseline year
CHT	Community Health Team
CMMI	Center for Medicare & Medicaid Innovation
CMS	Centers for Medicare & Medicaid Services
DSR	Delivery System Reform
DVHA	Department of Vermont Health Access
DID	Difference-in-differences
EB	Entropy balancing
ED	Emergency department
ERISA	Employee Retirement Income Security Act
FFS	Fee-for-Service
HSA	Health Service Area
GMCB	Green Mountain Care Board
NGACO	Next Generation Accountable Care Organization
MA	Medicare Advantage
MAPCP	Multi-Payer Advanced Primary Care Program
MAT	Medication-Assisted Treatment
MIPS	Merit-based Incentive Payment System
SSP	Shared Savings Program
QEM	Qualified evaluation and management visit
QHP	Qualified Health Plan
PBPY	Per beneficiary per year
PCMH	Patient-Centered Medical Homes
PBPM	Per beneficiary per month
PSM	Propensity Score Matching
PY	Performance year
RUCC	Rural Urban Continuum Code
RQ	Research question
SASH	Support and Services at Home

Acronym	Definition
SIM	State Innovation Model
SNF	Skilled nursing facility
SSP	Shared Savings Program
TCOC	Total cost of care
VCP	Vermont Collaborative Physicians
VHCIP	Vermont Health Care Innovation Project
VTAPM	Vermont All-Payer Accountable Care Organization Model
UVM	The University of Vermont
ZCTA	Zip Code Tabulation Area

Appendix B. List of Evaluation Research Questions

The evaluation uses a mixed-methods approach involving both primary and secondary (structured and unstructured) data sources to assess how stakeholders have implemented the Model, and the extent to which and the reasons why the Model achieved its intended outcomes. **Appendix Exhibit B.1** crosswalks the research questions for the evaluation with the conceptual model domains and lists data sources and analytic methods we will use to address them. In addition, we highlight the questions we begin to address in the current memo.

Appendix Exhibit B.1: Core Research Questions, Data Sources, and Analytic Methods

Research Questions	Data Sources								Analytic Approach	Addressed in Report
	Primary		Secondary							
	Provider Survey	Interviews	Commercial Claims	T-MSIS	Medicare FFS	CAHPS	Community and Publicly Available Data [a]	Model Programmatic Data [b]		
Program design features										
1. How do ACO program design features compare across payers and to other out-of-state federal and non-federal ACO programs?		●						●	Descriptive analysis; Thematic analysis; Triangulation of qualitative and programmatic data	See Chapter 2: Model Aims and Key Program Design Features; Comparison to Other Medicare ACO Initiatives
Model participants and implementation partners										
2. How did characteristics of commercial, Medicaid, and Medicare beneficiaries aligned with the ACO change as the statewide ACO scale increased?		●	●	●	●		●		Descriptive trend analysis; Thematic analysis to inform interpretation of findings	Chapter 4: Assessing Scale Target Performance by Payer and Performance Period

Research Questions	Data Sources								Analytic Approach	Addressed in Report
	Primary		Secondary							
	Provider Survey	Interviews	Commercial Claims	T-MSIS	Medicare FFS	CAHPS	Community and Publicly Available Data [a]	Model Programmatic Data [b]		
Implementation										
3. How did state, ACO, and payers work together to reach the statewide ACO scale targets? What barriers did they encounter?		●							Thematic analysis	See Chapter 3: Implementation of the Payment Model Chapter 4: Assessing Scale Target Performance by Payer and Performance Period; Barriers and Opportunities to Increasing Participation and Achieving Scale Targets
4. How did health-care delivery and public health systems collaborate to reach the population-level health goals?		●							Thematic analysis	See Chapter 3: Addressing Population Health Goals
5. What were key issues for the GMCB when setting the trend factor for the benchmark of the modified NGACO/Vermont Medicare ACO Initiative?		●							Thematic analysis	See Chapter 2: Model Aims and Key Program Design Features
6. How did the GMCB use its regulatory authority to influence ACO care management programs and organizational structure?		●						●	Thematic analysis; Triangulation of qualitative and programmatic data	See Chapter 3: GMCB Regulatory Authority

Research Questions	Data Sources								Analytic Approach	Addressed in Report
	Primary		Secondary							
	Provider Survey	Interviews	Commercial Claims	T-MSIS	Medicare FFS	CAHPS	Community and Publicly Available Data [a]	Model Programmatic Data [b]		
7. What challenges did participating providers encounter? How do the Model's key design features influence participating providers' care delivery transformations?		●							Thematic analysis	See Chapter 3: Implementation: Engaging Providers
8. How did program design features impact implementation at the community level?		●							Thematic analysis	See Chapter 3: Addressing Population Health Goals
Outcomes: Implementation effectiveness										
9. How did ACO provider network for each payer evolve as the statewide ACO scale increased?	●	●					●		Descriptive analysis; Network analysis; Thematic analysis; Triangulation of quantitative and qualitative data	See Chapter 3: Implementation: Engaging Providers Chapter 4: Model Participation—Hospitals, Practitioners, and Beneficiaries
10. What are participating and non-participating providers' impressions of the Model?	●	●							Survey analysis; Thematic analysis; Triangulation of survey and qualitative data	See Chapter 3: Implementation: Engaging Providers
11. Why did providers refuse or cease to contract with the ACO?	●	●							Survey analysis; Thematic analysis; Triangulation of survey and qualitative data	N/A

Research Questions	Data Sources								Analytic Approach	Addressed in Report
	Primary		Secondary							
	Provider Survey	Interviews	Commercial Claims	T-MSIS	Medicare FFS	CAHPS	Community and Publicly Available Data [a]	Model Programmatic Data [b]		
12. What impact did the Model have on the Model-specific health-care delivery system and monitoring measures?[1]		●	●			●	●		Descriptive analysis; Pre-post analysis	N/A
Outcomes: Program effectiveness—population health										
13. How did the Model impact specific population health measures?		●					●		Synthetic Control Methods; Thematic analysis to inform interpretation of quantitative findings	See Chapter 5: Quality Performance Outcomes for the VTAPM
Outcomes: Program effectiveness—spending, utilization, cost of care										
14. What impact did the Model have on statewide Medicare and Medicaid, all-payer, and commercial insurance spending?		●	●	●	●				Descriptive analysis; DiD with group-specific trends; Thematic analysis to inform interpretation of quantitative findings	See Chapter 5: Impact of the VTAPM in the First Two Performance Years (State-Level analysis)
15. What impact did the Model have on spending, utilization, and quality of care outcomes for Medicaid, Medicare, and commercial insurance all-payer ACO populations?		●		●	●		●	●	Descriptive analysis; DiD with group-specific trends; Synthetic Control Methods; Thematic analysis to inform interpretation of quantitative findings	See Chapter 5: Impact of the VTAPM in the First Two Performance Years (ACO-Level analysis)

a) American Community Survey; Medicare Geographic Variation; CMS Public Use File; Behavioral Risk Factor Surveillance System; Area Resource Health File; County Health Ranking Data; National Vital Statistics System.
b) ACO application; Vermont annual reports; Section 1115 waiver.

[1] See Section 7, "Statewide Health Outcomes and Quality of Care Targets" of the Vermont All-Payer Accountable Care Organization Model Agreement for the list of population-level health goals, health-care delivery system measures and targets, and process milestones.

Appendix C. Qualitative Methods and Analysis

Appendix C.1: Key Domains

Qualitative data collection was grounded in the evaluation research questions and the conceptual framework. **Appendix Exhibit C.1** lists these domains and related subdomains, along with the associated research questions. This list guides the document review, interview guides, and coding of all qualitative data collected throughout the course of the evaluation.

Appendix Exhibit C.1: Qualitative Domains, Subdomains, and Associated Research Questions

Conceptual Framework	Domain	Subdomain	Definition
Context	Context	History of payment/ delivery System reform	State or local initiatives that preceded the All-Payer Model (SIM, prior ACO models); includes discussion of negotiation around the All-Payer Model
		Concurrent initiatives	Current statewide or local initiatives (e.g., Medicaid mental health reform, Burlington opioid task force)
		State policy context	Vermont political context (e.g., change in governor)
		Health-care market	Discussion of the health-care market (e.g., includes consolidation, specialty distribution, proportion of population in self-funded/ERISA plans, hospital characteristics)
		Population characteristics	Variation in population sociodemographic and cultural characteristics across HSAs (e.g., care seeking behavior, health behavior)
		Health-care workforce	Description of health-care workforce in Vermont (e.g., shortages, culture, composition)
		HSA specific	Description of HSA specific characteristics and initiatives
Program Design and Features	ACO Stakeholders [cross-coded]	Federal – CMS/Medicare	Discussion of CMS, other CMMI models, Medicare
		State – GMCB	Discussion of GMCB's role, oversight, levers
		State – AHS/Medicaid	Any discussion of the Vermont AHS, DVHA and their role; any discussion of Medicaid (may include discussion specific to the All-Payer Model, as well as other initiatives)
		State - Blueprint	Discussion of Blueprint at the state level (local discussion of Blueprint should be captured under Community Health Teams and Community Collaboratives)

Conceptual Framework	Domain	Subdomain	Definition
		Commercial/ self-insured payers	Discussion of commercial insurer and self-insured plan participation and considerations
		ACO – OneCare governance/leadership	Discussion of their role/oversight (for oversight, cross code with provider, hospital, etc.)
		Hospitals	Discussion of hospital network, participation, programs
		Consultants and vendors	Discussion of ACO consultants and vendors
		Physicians/FQHCs	Discussion of physician and FQHC network, recruitment, and engagement
		Beneficiaries	Discussion of beneficiary characteristics
		Other providers	SNFs, home health agencies, hospice, other community providers (does not include designated agencies, which are captured under Substance Use and Mental Health under care settings)
	Program Design	Payment	Anything related to AIPBP, financial risk, and payment options; flow of funds (e.g., CMS to state, ACO to providers)
		Quality measures	Conversations around aligning quality metrics, data collection, etc.
		Benefit enhancements	SNF 3-day rule waiver, post-discharge home visit waiver, telehealth
		Benchmark	Discussions that capture the setting of the state benchmark and financial targets
		Scale	Discussion of number of providers/aligned beneficiaries
Implementation Effectiveness	Implementation Effectiveness	Aligning incentives	Perceptions of alignment of incentives, payers, policies
		Changes	Changes specific to the model; captures organizational changes at the ACO, system, and provider levels, including changes in care delivery
		Unintended consequences	Unintended or unexpected implications or outcomes that came up during implementation of the model
		Stakeholder collaboration	Integration at the state and community levels among OneCare, the state, Blueprint, and existing infrastructure; among health care, public health, behavioral health providers; includes improvements in care coordination across entities and any collaboration across stakeholders
		Connecting patients to providers (access)	References to efforts to connect patients to providers, increase access to care
		Provider experience	Provider experience as a participant in the model; may be secondhand
		Beneficiary experience	Beneficiary experiences as part of the model referenced in discussion; may be secondhand

Conceptual Framework	Domain	Subdomain	Definition
Implementation	Population Health	Care Navigator	Discussion of OneCare's Care Navigator application
		Complex care coordination	OneCare program providing direct financial support to primary care and continuum of care to support OneCare's community-based care coordination model
		Value-based Incentive Fund	OneCare financial incentive for quality measure performance
		Comprehensive Payment Reform (CPR) pilot	OneCare payment and system delivery reform program for independent primary care practices to facilitate transition to a value-based payment model
		Specialist payment reform (SPR)	OneCare initiative supporting specialists to increase access and decrease lower acuity visits with alternative access models
		Primary prevention/ Preventive care	Includes programs supporting quadrant 1 of OneCare's model (RiseVT and Matching Funds), Annual Wellness Visits, and other preventive care programs and initiatives
		Regional clinical representatives	OneCare Financial support to 13 local providers and one statewide pediatrician to facilitate peer-to-peer engagement in ACO activities
		Innovation fund	One Care direct funding to test new innovative pilot programs
		PCMH	Discussion of PCMH practices, payments, and investments
		Community health teams	Blueprint Community Health Teams
		SASH	SASH program, including payment mechanisms
		Community Collaboratives/ Accountable Communities for Health	Community Collaboratives/Accountable Communities for Health
	Data Analytics/Health IT	Risk stratification	Approach to risk stratification for population health management
		Performance monitoring	Use of data to monitor performance
		EHR	Use of electronic health record (EHR) data for population health analytics, use of EHR for care coordination
		Interoperability/Data exchange	Discussion of ADT feeds, sharing of patient information across care

Conceptual Framework	Domain	Subdomain	Definition
Providers and Patients	Care Settings	Primary care	Initiatives specific to primary care
		Long-term services and supports	Discussion of long-term services and supports in the context of the All-Payer Model
		Substance use and behavioral health	Includes discussion of designated agencies, data exchange, care coordination related to substance abuse treatment, and behavioral health care
Impacts and Outcomes	Impacts and Outcomes	Quality	Discussion of quality of care as it relates to the Model
		Cost	Discussion of cost as it relates to the Model
		Health	Discussion of health as it relates to the Model
		Utilization	Discussion of utilization as it relates to the Model
Other	Cross Cutting	Facilitators	A factor that helps facilitate the implementation or some aspect of the Model
		Challenges/ Barriers	Challenges/barriers encountered
		Good quotes	Good quotes
		Off-the-record	Explicitly stated as off-the-record

Appendix C.2: Data Sources and Collection

This report draws on two qualitative data sources related to the VTAPM.

- Program documents, including budgets, slide decks, contracts, and websites
- Site visit interviews

Model Documents. We conducted a standardized review of the Model documentation (e.g., Model agreement, OneCare budgets, contracts, GMCB, and OneCare presentations). We developed a standardized instrument in Excel to catalog the information collected.

Site Visit Interviews. The purpose of the site visits was to obtain firsthand information about the All-Payer Model, as well as to understand OneCare Vermont's implementation, care management offerings, and data analytics capacity. Interviews also provided additional detail to the questions included in the provider survey. The document review, in addition to input from CMMI, GMCB, and OneCare Vermont, contributed to the creation of a list of initial key informants the qualitative team would interview during the site visit. Once interviews were scheduled, tailored protocols were developed. A two- to four-person team conducted each interview. A senior member of the team led each discussion; the second person took high-level notes and confirmed that all key points were covered; and a third staff member took detailed transcript-like notes.

The interview guides for the site visit were based on master protocols that were then tailored for the organization and stakeholder. The exhibit below includes interview guide templates for the

seven groups that were interviewed across Vermont. In 2019, 21 interviews were conducted over the four-day in-person site visit. In 2020, 28 interview were conducted virtually over a three month period.

- Green Mountain Care Board
- State Leadership (e.g., Department of Health, Medicaid)
- Blueprint
- One Care Vermont
- Provider
- Hospital
- Community/Designated Agency

Appendix Exhibit C.2 provides an overview of topics covered with individuals across all key stakeholders.

Appendix Exhibit C.2: Overview of Protocol Objectives and Topics

Level	Stakeholder Groups	Topics Addressed
OneCare Vermont	■ **Executive Leaders** ■ **Contract Managers**	■ How stakeholders work together to reach statewide ACO targets, and the barriers they encounter ■ How stakeholders use data on targets to make decisions ■ How health-care delivery and public health systems collaborate to reach population health goals, and barriers they encounter ■ Perceptions of changes to aligned beneficiaries after the rollout of the statewide ACO ■ Evolution of the provider network for each payer ■ Variation in program design features across payers, and comparison to other Medicare, Medicaid, and commercial ACO programs ■ Considerations for the GMCB in setting the trend factor for the benchmark ■ How the GMCB used its regulatory authority to influence care management programs and organizational structure, and impact of the GMCB decisions on implementation ■ Perceptions of impact of All-Payer ACO on health-care delivery system and population-level health goals ■ Implementation successes and challenges
State	■ **Green Mountain Care Board (GMCB):** independent regulatory board that oversees the VT All-Payer ACO model (including reporting to CMS), regulates the ACO, and reviews hospital budgets, payer rates, and certificates of need. ■ **Department of Vermont Health Access (DVHA):** Medicaid agency that has contracted with OneCare as a component of the All-Payer Model Agreement ■ **Blueprint for Health:** supports population health programs across the state including the community health teams ■ **Commercial Payers**	

Level	Stakeholder Groups	Topics Addressed
HSA-Level Community Providers	▪ **Community Health Teams**: may be co-located with the practices ("embedded") or centralized at a convenient location ▪ **Community Collaboratives**: governance structure for multi-sector population health planning in Vermont communities ▪ **Health and Social Service Agencies, Inc. VNA; Area Agencies on Aging; Mental Health Agencies; Home Health Agencies; Housing Authorities (includes care coordinators)**: Partner with ACO ▪ **Hubs**: regional specialty addictions treatment centers regulated as Opioid Treatment Programs operated by community behavioral health agencies. ▪ **Spoke providers**: health-care professionals led by physicians who prescribe buprenorphine in practices regulated as Office-Based Opioid Treatment Programs ▪ **SASH Providers**: connect local health and long-term care systems for Medicare beneficiaries in subsidized housing and residences in the community at large.	▪ How health-care delivery and public health systems collaborate to reach population health goals, and barriers they encounter ▪ Impact of various design features on care delivery over time ▪ Perceptions of impact of All-Payer ACO on health-care delivery system and population-level health goals ▪ Ability to reach target populations ▪ Implementation successes and challenges
HSA-Level Providers and Provider Organizations	▪ **University of Vermont Medical Center and Dartmouth-Hitchcock**: founding partners of OneCare ▪ **Hospitals** ▪ **FQHCs** ▪ **PCMH Practice Providers and Staff** ▪ **PCMH Practice Facilitators**: helps Vermont's primary care practices achieve and maintain recognition as PCMHs ▪ **Other Primary Care Clinic Providers and Staff** ▪ **Rural Health Clinics**: participating providers of care under OneCare Vermont, providing care to rural areas. These clinics serve as part of Community Collaboratives. ▪ **Skilled Nursing Facilities**: covered under services provided by OneCare Vermont as a participating provider	▪ How health-care delivery and public health systems collaborate to reach population health goals and barriers they encounter ▪ Opinions on the Model ▪ Impact of various design features on care delivery transformation at the provider level, over time ▪ Reasons providers choose not to participate or cease participation

Appendix C.3: Analytic Methods

Analysis of qualitative data uses a thematic approach. We coded data into categories based on the key evaluation domains—the features of OneCare Vermont and their providers, the impacts of the model, variations in model impacts, and motivation and challenges in implementation. Our coding and analysis focused on identifying existing and emergent themes. Existing themes are topics derived from the study's research questions and categories. Emergent themes arise out of discussions with key stakeholders within Vermont, including state leadership, GMCB, OneCare Vermont, hospitals, designated agencies, and providers. For example, under a code for program

design features, we may create emergent subcodes to capture concepts or discussions surrounding payment, quality measures, benchmark, or scale.

Coding Approach and Analysis. Our evaluation team started with systematic review of OneCare Vermont's applications and budget documents. These documents informed key informant outreach and protocol development. Once primary data was collected and transcribed, the qualitative team reviewed all transcripts for quality. This review process allowed us to extract themes and develop categories and their corresponding definitions to guide coding of data from interviews. These themes were used to create a code book based on an iterative review of the data that was further informed by several rounds of pilot coding. We used NVivo software (QSR International Pty Ltd., Melbourne, Australia) to code the interviews. Our approach to coding was both inductive and deductive from the outset, including the following steps:

- Develop and define analytic categories, based on our research question and the salient analytic dimensions (e.g., OneCare Vermont-funded infrastructure and personnel)
- Operationalize the research question and Model-based analytic dimensions in the codebook, which provide clear and concise guidelines for categorizing all qualitative data collected
- Qualitative team refinements to the initial version of the codebook, including routine review and revision at the outset of coding newly collected data, to take into account the complexity of the data and changes to the VTAPM and implementation experience

This synthesis identified emerging themes and allowed us to interpret qualitative data findings in a systematically iterative manner by exploring said themes across stakeholders. Analysis involved reviewing findings across codes to qualitatively describe the interrelationship between organizational characteristics, history, implementation, and performance. To systematically glean themes from in-person interviews conducted for PY1 and PY2, we also developed comprehensive summary documents that captured themes of interest based on an analysis of coded primary data (including fields for emergent themes). These summaries covered the following domains: collaboration between stakeholders, impact and performance measurement, model participation, payment funding and flow, population health, state oversight, and substance use and behavioral health. Senior scientists iteratively reviewed the coded data and thematic summaries generated from the site visit notes and transcripts to ensure accuracy of interpretation; this enabled them to accurately contextualize data points. They reviewed data under appropriate codes and synthesized data into succinct points reporting.

Appendix D. Quantitative Methods and Analysis

In this section, we present the following additional information on the impact analysis approach: data sources; definition of the ACO-level treatment group; sampling methods used to construct the comparison pool; claims-based attribution algorithms employed to implement the treatment and comparison groups; definition and operationalization of the claims-based outcome measures; and the analytic approach employed to estimate impacts.

Appendix D.1: Data Sources

Appendix Exhibit D.1.1: Data Sources for Quantitative Analyses

Data	Years	Rationale	Source(s)
Medicare beneficiary and enrollment database and claims files	2011-2018	Identify health, cost, utilization, and quality outcomes for Medicare beneficiaries	CMS Virtual Research Data Center (VRDC)
NGACO participating and preferred provider lists	2018-2019	Identify participating and preferred providers to attribute beneficiaries	CMS
National Plan and Provider Enumeration System (PPES) file	2018	Identify provider specialty	CMS
American Community Survey (ACS) One- and Five-Year Estimates	2014-2017	Measure demographics, health status, health-care resources, and utilization at the county and state level	Census Bureau
Behavioral Risk Factor Surveillance System (BRFSS)	2014-2017	Measure population health at the county and state level	CDC
Medicare Geographic Variation Public Use File	2017	Identify Medicare utilization, spending, and provider characteristics at the county and state level	CMS
Rural-Urban Commuting Area Codes	2013	Measure rurality	U.S. Dept. of Agriculture, Economic Research Service (ERS)
CCW Master Data Management Database	2016	Identify beneficiary enrollment in Medicare ACO's other competing CMS initiatives	CMS VRDC
Area Health Resource Files (AHRF)	2015-2016	Identify number of active doctors, Medicare FFS beneficiaries, and hospital beds	HRSA

Appendix D.2: Sampling Methods for Constructing the Comparison Pool

We identified comparison states with similar histories of health reform initiatives relevant to the evolution of the VTAPM, specifically Primary Care Medical Home (PCMH) initiatives and multi-payer reform initiatives (e.g., SIM, MAPCP). To avoid contamination of Model impacts, we excluded any states that share a boundary with Vermont. Additionally, we excluded Maryland and Pennsylvania because these states are also currently implementing CMMI-funded all-payer reform initiatives. **Appendix Exhibit D.2.1** lists the 26 states selected for inclusion in the comparison group.

Appendix Exhibit D.2.1: Comparison Group States

Arkansas	Iowa	Oregon
California	Louisiana	Pennsylvania
Colorado	Maine	Rhode Island
Connecticut	Michigan	South Carolina
Delaware	Minnesota	Tennessee
Florida	Missouri	Texas
Georgia	New Mexico	Washington
Hawaii	North Carolina	Wyoming
Idaho	Ohio	

We considered all eligible beneficiaries residing within each of the comparison states for inclusion in the comparison pool. To minimize computational burden involved in using a sizable comparison pool, we used a stratified, random sample of beneficiaries. Over 19 million eligible beneficiaries (95 million beneficiary-years) resided in the comparison states during the analytic period. Conducting impact analyses on a sample exceeding 10 million beneficiaries per year is computationally challenging and would call for analytical resources exceeding those allocated for this evaluation. Therefore, as shown in **Appendix Exhibit D.2.2**, we implemented the following steps to draw a stratified, random sample of beneficiaries from the comparison states to create the comparison pool.

Step 1: Stratify all Medicare beneficiaries residing in the comparison states by state of residence, year, and rurality (based on Rural-Urban Continuum Code classification [RUCC]: metropolitan; non-metropolitan – urban; and non-metropolitan – rural).

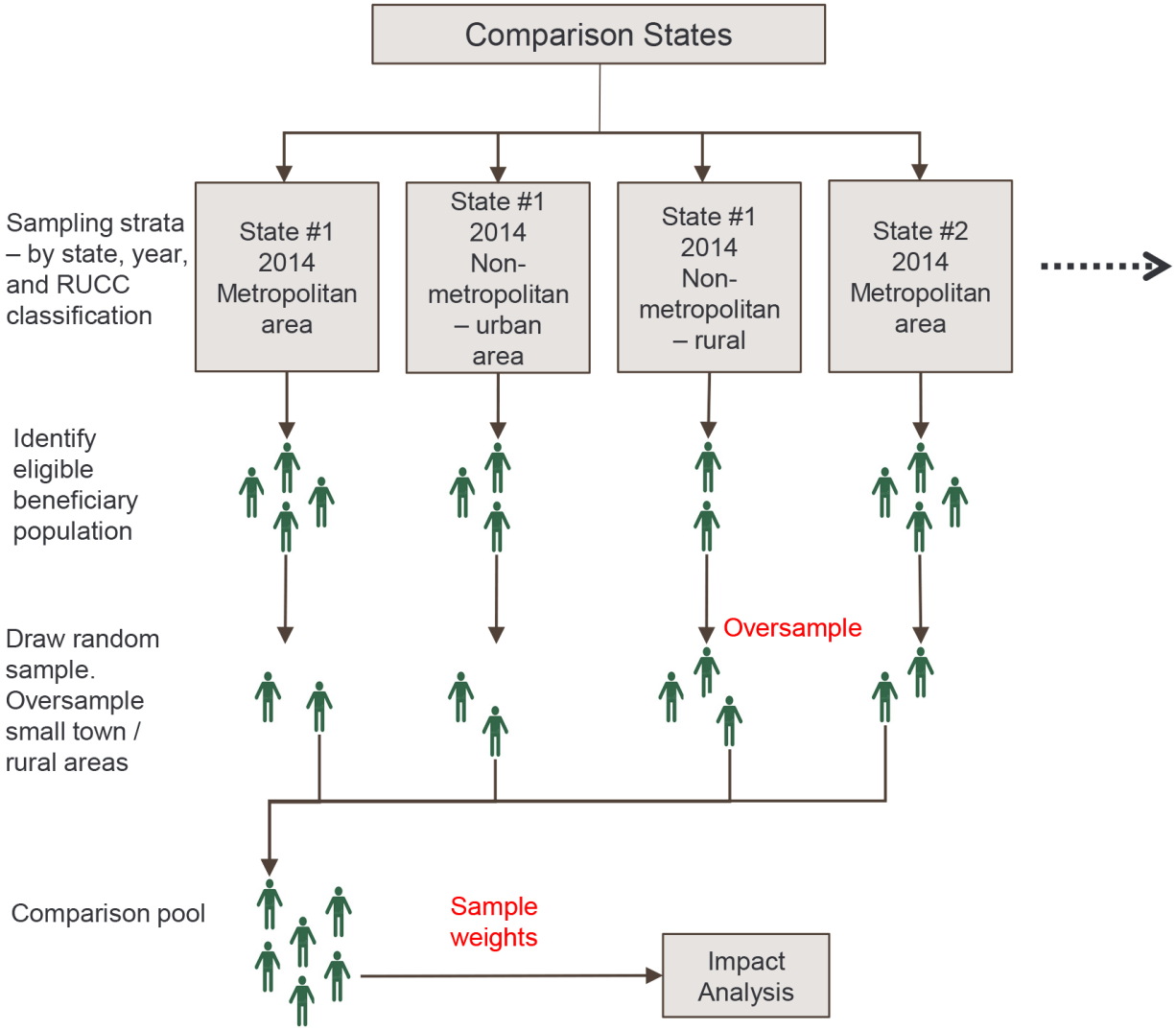
Step 2: Select beneficiaries who meet the insurance coverage (continuous FFS coverage and no MA coverage) attribution criteria.

Step 3: Oversample beneficiaries who reside in rural areas by including all beneficiaries who reside in counties with a small town/rural RUCC designation. Draw a random sample of eligible

beneficiaries from counties with a metropolitan or non-metropolitan RUCC designation. The sample size allocation for each strata is set to match Vermont's population breakdown by RUCC.

Step 4: Generate sample weights to ensure that the comparison pool sample is representative of the eligible population residing in the comparison states. Incorporate sampling weights in the estimation of the Model's impacts.

Appendix Exhibit D.2.2: Comparison Pool Sampling Design



As shown in **Appendix Exhibit D.2.3**, this approach yielded a comparison pool sample that was representative of comparison states with a computationally manageable sample size of 19 million beneficiary-years.

Appendix Exhibit D.2.3: Comparison Pool Sample

Year	RUCC Designation	Beneficiaries in VT Counties		Beneficiaries in Comparison Pool Counties		Stratified, Random Sample of Comparison Pool Beneficiaries	
		N	%	N	%	N	%
2014	Metropolitan	25,016	23.62%	18,840,032	78.94%	3,248,236	27.40%
2014	Non-metropolitan – urban	66,750	63.04%		19.06%		60.94%
2014	Non-metropolitan – rural	14,124	13.34%		2.01%		11.65%
2015	Metropolitan	25,283	23.27%	18,856,517	78.97%	3,232,787	27.15%
2015	Non-metropolitan – urban	68,479	63.03%		19.03%		61.19%
2015	Non-metropolitan – rural	14,876	13.69%		2.00%		11.66%
2016	Metropolitan	25,808	23.19%	19,170,616	79.08%	3,269,451	27.19%
2016	Non-metropolitan – urban	69,840	62.75%		18.95%		61.24%
2016	Non-metropolitan – rural	15,643	14.06%		1.97%		11.57%
2017	Metropolitan	26,202	23.32%	19,194,282	79.10%	3,273,491	27.35%
2017	Non-metropolitan – urban	70,374	62.64%		18.93%		61.10%
2017	Non-metropolitan – rural	15,766	14.03%		1.97%		11.55%
2018	Metropolitan	27,055	23.77%	18,920,027	79.17%	3,237,396	27.78%
2018	Non-metropolitan – urban	71,042	62.42%		18.86%		60.71%
2018	Non-metropolitan – rural	15,717	13.81%		1.97%		11.50%
2019	Metropolitan	27,531	24.10%	18,843,295	79.25%	3,238,353	28.05%
2019	Non-metropolitan – urban	71,060	62.21%		18.77%		60.45%
2019	Non-metropolitan – rural	15,638	13.69%		1.98%		11.50%

NOTE: The breakdown by RUCC designation for the comparison pool sample does not exactly match Vermont's proportions in this table because we applied the stratification within each of the 29 comparison states.

Appendix D.3: Claims-Based Attribution of Beneficiaries to the Treatment and Comparison Groups

In this section, we describe the claims-based attribution logic employed to construct the state and comparison groups.

Below, we describe the claims analysis steps for attributing beneficiaries to the state-level treatment and comparison groups. **Appendix Exhibit D.3.1** presents the "step-down" counts associated with the state-level attribution criteria.

Step 1. We used the 2014-2019 Medicare Beneficiary Summary File (MBSF) Base segments to identify beneficiaries with the following enrollment and geography inclusion criteria:

- Covered by Medicare Parts A and B throughout performance period or until death

- No months of MA or other Medicare managed care plan (Part C)
- No months of coverage where Medicare is the secondary payer
- Reside in Vermont or an identified comparison county
- Have at least one paid QEM claim during the alignment period

Step 2. For the eligible beneficiaries identified in Step 1, we extracted 2014-2019 Outpatient header and service line final paid claims submitted by Federally Qualified Health Centers (FQHC), Rural Health Clinics (RHC), or Critical Access Hospitals (CAH)[2] with a claims processing date on or before March 31 of the following year. We retained the claims rendered by an attending physician who billed using the eligible provider specialty codes.[3]

Step 3. We identified Outpatient service line claims associated with the Outpatient header claims selected in Step 2 and retained the claims that had an Healthcare Common Procedure Coding System (HCPCS) code that qualified as an eligible QEM[4] and had an allowed charge greater than 0. For CAHs, the revenue center code must also be eligible.

Step 4. For the eligible beneficiaries identified in Step 1, we extracted 2014-2019 Carrier service line final paid claims with a claims processing date on or before March 31 of the following year and a HCPCS code that qualitied as a QEM. We retained claims that included an eligible provider specialty code.

Step 5. We retained the provider ID (i.e., TIN, NPI, and CCN) and allowable charge fields in the Outpatient and Carrier claims and merged both claims files to create an analytic dataset. Next, we calculated the total allowed charges for each beneficiary in each BY (2014-2016) and PY (2017-2019). Finally, we identified claims with a provider specialty code associated with primary care practice specialty and calculated the total allowed charges for each beneficiary in each BY (2014-2016) and PY (2017-2019). If the proportion of total allowed charges billed by practitioners with a primary care specialty code exceeded 10 percent of total allowed charges during a given BY or PY, the beneficiary was attributed to the state-level treatment and comparison groups through their primary care practitioner in Step 6. All other beneficiaries were attributed to the state-level treatment and comparison groups through their specialists in the next step. Primary care specialists are given preference and ties are broken by the date of the claim.

[2] FQHCs, RHCs and CAHs were identified based on the billing codes 77, 71, and 85, respectively on outpatient claims.

[3] Primary care practitioners included those with specialty codes 01, 08, 11, 37, 38, 50, 89, 97. Specialists included those with specialty codes 06, 12, 13, 16, 23, 25, 26, 27, 29, 39, 46, 70, 79, 82, 83, 84, 86, 90, 98.

[4] Qualified QEM codes are the following: 99201, 99202, 99203, 99204, 99205, 99211, 99212, 99213, 99214, 99215, 99324, 99325, 99326, 99327, 99328, 99334, 99335, 99336, 99337, 99339, 99340, 99341, 99342, 99343, 99344, 99345, 99347, 99348, 99349, 99350, 99495, 99496, 99490, G0402, G0438, G0439.

Step 6. If the proportion of total allowed charges for QEM services billed by primary care practitioners exceeded 10 percent, we retained QEM service claims billed by primary care practitioners and excluded QEM service claims billed by other practitioners. Next, we identified QEM service claims rendered within the state in which the beneficiary resided during the calendar year. For the treatment group, we also identified QEM service claims rendered by VTAPM participants. If the proportion of total QEM service claims rendered within the state of residence (or by VTAPM participants, in the case of the treatment group) exceeded 50 percent, the beneficiary was attributed to the state-level treatment or comparison group. If the total allowed charges for QEM services billed by primary care practitioners did not exceed 10 percent, we retained QEM service claims billed by eligible specialists and applied the same attribution logic described above to attribute beneficiaries to the state-level treatment and comparison groups.

Appendix Exhibit D.3.1: State-Level Attribution Step-Down Table

Attribution Criteria	Description	Number of Beneficiaries					
		BY3 (CY2014)	BY2 (CY2015)	BY1 (CY2016)	PY0 (CY2017)	PY1 (CY2018)	PY2 (CY2019)
TREATMENT GROUP							
Geographic and Eligibility Criteria	Reside in VT (based on MBSF) and continuously covered under both Parts A & B throughout the CY or until death and zero months of MA coverage and zero months of Medicare as a secondary payer coverage	104,253	107,070	109,699	110,740	112,274	112,680
Claims Attribution Criteria	Receive any QEM from eligible practitioners	88,759	88,873	92,325	93,272	94,192	94,642
	Receive majority of QEMs within VT or from OneCare participants	**78,391**	**77,786**	**81,078**	**81,593**	**82,179**	**82,366**
	Receive at least 10% of allowed charges for QEMs from eligible PCPs	76,083	74,879	78,474	78,880	79,251	79,307
	Receive less than 10% of allowed charges for QEMs from eligible PCPs (i.e., specialist-aligned)	2,308	2,907	2,604	2,713	2,928	3,059
	Receive majority of QEMs (allowed charges) within VT	78,224	77,661	80,960	81,471	82,068	82,243

Attribution Criteria	Description	Number of Beneficiaries					
		BY3 (CY2014)	BY2 (CY2015)	BY1 (CY2016)	PY0 (CY2017)	PY1 (CY2018)	PY2 (CY2019)
COMPARISON GROUP							
Geographic and Eligibility Criteria	Reside in comparison state (based on MBSF) and continuously covered under both Parts A & B throughout the CY or until death and zero months of MA coverage and zero months of Medicare as a secondary payer coverage	3,162,178	3,148,385	3,184,647	3,189,001	3,153,818	3,156,605
Claims Attribution Criteria	Receive any QEM from eligible practitioners	2,606,811	2,576,058	2,682,065	2,692,625	2,663,407	2,671,280
	Receive majority of QEMs within comparison state	**2,481,475**	**2,447,024**	**2,556,422**	**2,567,388**	**2,538,999**	**2,544,797**
	Receive at least 10% of allowed charges for QEMs from eligible PCPs	2,316,158	2,284,739	2,436,299	2,455,945	2,433,109	2,444,062
	Receive less than 10% of allowed charges for QEMs from eligible PCPs (i.e., specialist-aligned)	165,317	162,285	120,123	111,443	105,890	100,735

Appendix D.4: Claims-Based Attribution for the ACO-Level Analysis of Impact

In this section, we describe the claims-based attribution logic employed to construct the ACO and comparison groups. The Model's participant list for PY1 was used to identify practices participating in the VTAPM. **Appendix Exhibit D.4.1** summarizes the contents of the participation lists. The CY2018 and CY2019 Medicare SSP Track 1 ACO participant list was used to identify the comparison group practices. We limited comparison group participants to those who provided services within the comparison states. The TIN and CMS Certification Number (CCN) was used to identify bills submitted by the identified practices.[5] The claims-based attribution logic used paid QEM service claims submitted by practitioners within the participating practices using the eligible specialty codes.[6] Attribution for the comparison group in each cohort mirrored the approach used for the treatment group. We used the same HCPCS and specialty codes that the Model used to attribute beneficiaries to the VTAPM.

Appendix Exhibit D.4.1: Treatment and Comparison Group Participant Lists

		PY1		PY2	
		Number of Health Centers (CCN)	Number of Practices (TIN)	Number of Health Centers (CCN)	Number of Practices (TIN)
Treatment Group	VTAPM Participants	11	22	18	36
Comparison Group	MSSP Track 1 ACO Participants Providing Services in the Comparison States	789	1,631	1,383	4,812

The first five steps of the ACO-level claims-based attribution logic is similar to the state-level analysis. Below, we describe the claims analysis steps that are unique to the construction of the ACO-level treatment and comparison groups. **Appendix Exhibits D.4.2 and D.4.3** present the step-down counts associated with the ACO-level attribution criteria for PY1 and PY2, respectively.

[5] FQHCs, RHCs, and CAHs were identified based on billing codes 77, 71, and 85, respectively, on outpatient claims. Practitioners billing through CAHs included those who receive payment from Medicare through the Optional Payment Method, where the CAH bills for facility and professional outpatient services to Medicare when physicians or practitioners reassign billing rights to them.

[6] Primary care practitioners included those with specialty codes 01, 08, 11, 37, 38, 50, 89, 97. Specialists included those with specialty codes 06, 12, 13, 16, 23, 25, 26, 27, 29, 39, 46, 70, 79, 82, 83, 84, 86, 90, 98.

Appendix Exhibit D.4.2: PY1 ACO-Level Attribution Step-Down Table

Attribution Criteria	Description	Number of Beneficiaries				
		BY3 (CY2014)	BY2 (CY2015)	BY1 (CY2016)	PY0 (CY2017)	PY1 (CY2018)
TREATMENT GROUP						
Geographic and Eligibility Criteria	Reside in VT (based on MBSF) and continuously covered under both Parts A & B throughout the CY or until death and zero months of MA coverage and zero months of Medicare as a secondary payer coverage	104,253	107,070	109,699	110,740	112,274
Claims Attribution Criteria	Receive any QEM from eligible practitioners	88,989	89,497	92,925	93,983	94,959
	Receive plurality of QEMs from OneCare participants	**34,408**	**36,649**	**37,557**	**38,827**	**40,727**
	Receive at least 10% of allowed charges for QEMs from eligible PCPs	33,652	35,843	36,856	38,130	39,999
	Receive less than 10% of allowed charges for QEMs from eligible PCPs (i.e., specialist-aligned)	756	806	701	697	728
COMPARISON GROUP						
Geographic and Eligibility Criteria	Reside in comparison state (based on MBSF) and continuously covered under both Parts A & B throughout the CY or until death and zero months of MA coverage and zero months of Medicare as a secondary payer coverage	3,162,178	3,148,385	3,184,647	3,189,001	3,153,818
Claims Attribution Criteria	Receive any QEM from eligible providers	2,606,663	2,580,424	2,687,473	2,700,200	2,672,034
	Receive plurality of QEMs from CY2018 Track 1 MSSP participants	**343,902**	**363,258**	**400,532**	**420,507**	**427,876**
	Receive at least 10% of allowed charges for QEMs from eligible PCPs	326,164	345,253	387,419	408,017	415,650
	Receive less than 10% of allowed charges for QEMs from eligible PCPs (i.e., specialist-aligned)	17,738	18,005	13,113	12,490	12,226

Appendix Exhibit D.4.3: PY2 ACO-Level Attribution Step-Down Table

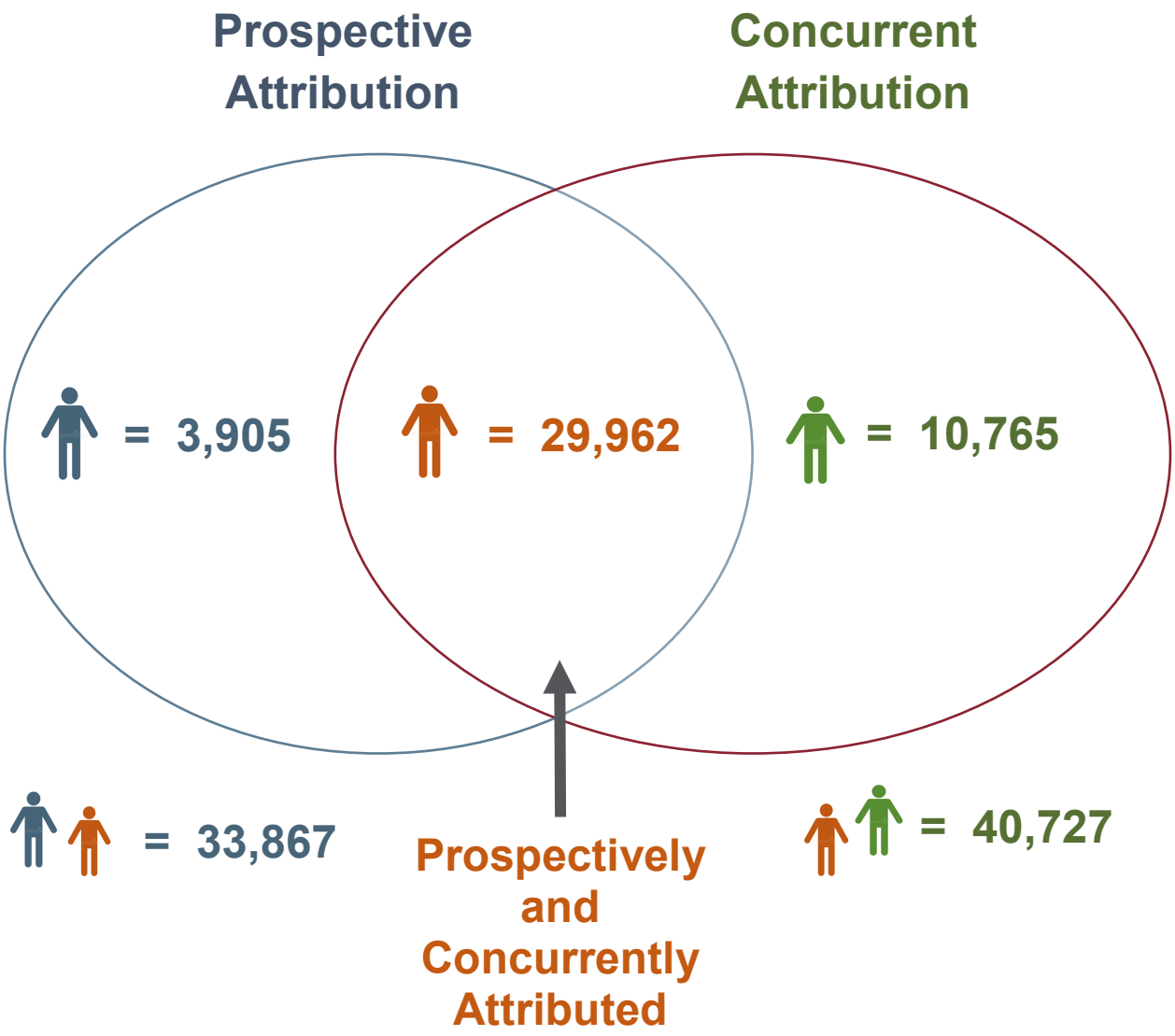
Attribution Criteria	Description	Number of Beneficiaries					
		BY3 (CY2014)	BY2 (CY2015)	BY1 (CY2016)	PY0 (CY2017)	PY1 (CY2018)	PY2 (CY2019)
TREATMENT GROUP							
Geographic and Eligibility Criteria	Reside in VT (based on MBSF) and continuously covered under both Parts A & B throughout the CY or until death and zero months of MA coverage and zero months of Medicare as a secondary payer coverage	104,253	107,070	109,699	110,740	112,274	112,680
Claims Attribution Criteria	Receive any QEM from eligible practitioners	89,168	89,980	93,486	94,585	95,645	96,176
	Receive plurality of QEMs from OneCare participants	**43,594**	**46,264**	**50,454**	**52,165**	**53,830**	**53,915**
	Receive at least 10% of allowed charges for QEMs from eligible PCPs	42,707	45,409	49,703	51,444	53,145	53,245
	Receive less than 10% of allowed charges for QEMs from eligible PCPs (i.e., specialist-aligned)	887	855	751	721	685	670
COMPARISON GROUP							
Geographic and Eligibility Criteria	Reside in comparison state (based on MBSF) and continuously covered under both Parts A & B throughout the CY or until death and zero months of MA coverage and zero months of Medicare as a secondary payer coverage	3,162,178	3,148,385	3,184,647	3,189,001	3,153,818	3,156,605

Attribution Criteria	Description	Number of Beneficiaries					
		BY3 (CY2014)	BY2 (CY2015)	BY1 (CY2016)	PY0 (CY2017)	PY1 (CY2018)	PY2 (CY2019)
Claims Attribution Criteria	Receive any QEM from eligible providers	2,607,418	2,581,460	2,689,493	2,702,151	2,674,002	2,682,995
	Receive plurality of QEMs from CY2019 Track 1 MSSP participants	**539,180**	**561,371**	**620,031**	**655,821**	**673,446**	**675,475**
	Receive at least 10% of allowed charges for QEMs from eligible PCPs	510,075	532,054	598,380	635,153	653,225	656,249
	Receive less than 10% of allowed charges for QEMs from eligible PCPs (i.e., specialist-aligned)	29,105	29,317	21,651	20,668	20,221	19,226

Step 6. If the proportion of total allowed charges for QEM services billed by primary care practitioners exceeded 10 percent, we retained QEM service claims billed by primary care practitioners and excluded QEM service claims billed by other practitioners. Next, we identified the practice that was responsible for providing the plurality of QEM service claims rendered by eligible primary care specialists during each BY and PY. For the treatment pool beneficiaries, if the identified practice was a VTAPM participant, we attributed the beneficiary to the treatment group. For the comparison pool beneficiaries, if the practice was Medicare SSP Track 1 participant in a PY, we attributed the beneficiary to the comparison group for that respective PY. If the total allowed charges for QEM services billed by primary care practitioners did not exceed 10 percent, we retained QEM service claims billed by eligible specialists and applied the same attribution logic described above to attribute beneficiaries to the ACO-level treatment and comparison groups.

Appendix D.5: Overlap between the Prospectively and Concurrently Attributed Populations

Appendix Exhibit D.5.1: Overlap between the Prospectively and Concurrently Attributed Populations in PY1



NOTE: Prospective attribution analysis performed by Program Analysis Contractor (PAC); Concurrent attribution analysis performed by NORC.

Appendix Exhibit D.5.2: Descriptive Characteristics of Beneficiaries Aligned by Prospective and Concurrent Attribution, PY1

	Prospective Only	Concurrent Only
Number of beneficiaries	3,905	10,765
Total Person-Months	42,747.14	127,629.13
Mean Months of Alignment (SD)	10.95 (2.98)	11.86 (1)
Mean Age (SD)	71.62 (13.73)	69.99 (12.51)
Gender (%)		
Male	47.7	44.6
Race/Ethnicity (%)		
White	94.8	93.7
Black	0.4	0.6
Hispanic	0.6	0.7
Asian	0.3	0.4
Other	3.9	4.6
Location (%)		
Rural	67.3	70.1
Disability/ESRD (%)		
Disability	18.6	17.6
ESRD	0.3	0.4
Coverage (%)		
Any Dual Eligibility	32.1	27.6
Any Part D Coverage	78.1	82.5
Chronic Conditions		
Mean No. of Chronic Conditions (SD)	4.07 (3.94)	3.63 (3.54)

SOURCE: NORC analysis of Medicare Beneficiary Summary File (MBSF).NOTE: Prospective attribution analysis performed by Program Analysis Contractor (PAC); Concurrent attribution analysis performed by NORC.

Appendix D.6: Specifications for the Claims-Based Evaluation Measures

Appendix Exhibit D.6 details definitions for the claims-based outcome measures for which we assess the Model's impacts. The outcome measures are total Medicare spending, eight categories of Medicare spending by care setting and service, 13 utilization measures, and two quality-of-care measures.

Appendix Exhibit D.6: Definitions for Claims-Based Outcome Measures

Measure	Definition
Medicare Spending*	
Total Medicare Parts A & B spending PBPY	Total Medicare Part A and Part B spending (2019 USD) PBPY aligned with the VTAPM or comparison group. Spending includes Medicare paid amount on Parts A and B claims from the start of the year until the end of the year or until the end date for when the beneficiary remained aligned (i.e., until the s/he was excluded due to alignment exclusion criteria), for the treatment or comparison group.
Utilization	
Acute care hospital *stays* per 1,000 beneficiaries per year (BPY)	Number of acute care hospital stays per 1,000 BPY aligned with the VTAPM or comparison group. Stays that included transfers between facilities were counted as one stay. Stays that commenced after the start of the year until the end of the year, or until the date the beneficiary remained aligned with the treatment or comparison group, are counted towards the measure.
Acute care hospital *days* per 1000 BPY	Number of acute care hospital days per 1,000 BPY aligned with the VTAPM or comparison group. Inpatient days after the start of the year until the end of the year, or until the date the beneficiary remained aligned with the treatment or comparison group, are counted towards the measure.
Emergency department (ED) visits (including observation stays) per 1,000 BPY	Number of ED visits including observational stay per 1,000 BPY aligned with the VTAPM or comparison group. Visits that included transfers between ED facilities were counted as one visit. Visits from the start of the year until the end of the year, or until the date the beneficiary remained aligned with the treatment or comparison group, are counted towards the measure.
Primary E&M visits per 1,000 BPY	Number of E&M visits with primary care providers PBPM aligned with the VTAPM or comparison group. Primary care providers include 01 (general practice); 08 (family practice); 11 (internal medicine); 12 (osteopaths); 16 (obstetrics/ gynecology); 35 (chiropractors); 38 (geriatric medicine); 48 (podiatrists); 50 (nurse practitioner); 80 (licensed clinical social worker); 84 (preventive medicine); and 97 (physician assistant). Annual wellness visits are excluded from this measure.
Specialty E&M visits per 1,000 BPY	Number of E&M visits with specialist providers (excluding hospital and ED visits) during the year through alignment end date, divided by months of alignment eligibility. Specialist providers are defined as all those who are not primary care providers, noted above.
SNF *stays* per 1,000 BPY	Number of SNF stays per 1,000 beneficiaries per year aligned with the VTAPM or comparison group. SNF stays that commenced after the start of the year until the end of the year, or until the date the beneficiary remained aligned with the treatment or comparison group, are counted towards the measure.

Measure	Definition
SNF *days* per 1,000 BPY	Number of SNF days per 1,000 BPY aligned with the VTAPM or comparison group. SNF days after the start of the year until the end of the year, or until the date the beneficiary remained aligned with the treatment or comparison group, are counted towards the measure.
Home health visits per 1,000 beneficiaries per year	Number of home health (HH) visits per 1,000 BPY aligned with the VTAPM or comparison group. The number of HH visits were identified based on lines with revenue center codes 420-449 and 550-599. Visits from the start of the year until the end of the year, or until the date the beneficiary remained aligned with the treatment or comparison group, are counted towards the measure.
Home health episodes per 1,000 BPY	Number of episodes of HH for 1,000 beneficiaries during the period aligned with the VTAPM or comparison group. Episodes include sum of 60-day HH episodes, as well as HH episodes with low-utilization payment adjustments (LUPA) and partial episode payment (PEP) adjustments.
Hospice days per 1,000 BPY	Number of days of hospice service use per 1,000 BPY aligned with the VTAPM or comparison group. Days of hospice use counted using the claim from and though dates on hospice claims. Hospice days after the start of the year until the end of the year, or until the date the beneficiary remained aligned with the treatment or comparison group, are counted towards the measure.
Imaging, procedures, and tests per 1,000 BPY	Counts of imaging, procedures, and tests per 1,000 BPY aligned with the VTAPM or comparison group. These were computed using the BETOS codes on the carrier claims, and were specified as the number of claims for a beneficiary with codes "PXX," "TXX," and "IXX" incurred between the beneficiary's alignment start and end dates in each year.
Access to and Quality of Care	
Beneficiaries with *Annual Wellness Visit* (AWV) per 1,000 per year	Number of beneficiaries with an AWV in the year, per 1,000 beneficiaries aligned to the VTAPM or comparison group. This measure reflects the likelihood of beneficiaries receiving an AWV visit in the year. AWV codes on Medicare claims include G0438 (for the initial visit) and G0439 (for subsequent visits).
Beneficiaries with acute care hospitalizations for *ambulatory care-sensitive (ACS)* conditions per 1,000 per year	Number of beneficiaries with one or more ACSC acute care hospitalizations in the year, per 1,000 beneficiaries aligned with the VTAPM or comparison group. This measure reflects the likelihood of beneficiaries being hospitalized for ACSCs during the year. ACS hospitalizations include diabetes short-term complications, diabetes long-term complications, chronic obstructive pulmonary disease, or asthma in older adults, hypertension, heart failure, dehydration, bacterial pneumonia, urinary tract infection, uncontrolled diabetes, asthma in younger adults, and lower-extremity amputation among patients with diabetes. [7,8]

[7] Agency for Healthcare Research and Quality. Prevention Quality Overall Composite Technical Specifications, Prevention Quality Indicator 90, Version 6.0, 2016. http://www.qualityindicators.ahrq.gov/Downloads/Modules/PQI/V60-ICD09/TechSpecs/PQI_90_Prevention_Quality_Overall_Composite.pdf.

[8] For claims prior to October 1, 2015, with ICD-9 codes, we used Version 5.0 of PQI 90. For claims after October 1, 2015, with ICD-10 codes, we used Version 6.0 of PQI 90.

Measure	Definition
Beneficiaries with *unplanned readmissions within 30 days after hospital discharge* per 1,000 per year	Number of beneficiaries with one or more occurrences of unplanned hospital readmissions within 30 days of discharge in the year, per 1,000 beneficiaries aligned with the VTAPM or comparison group. This measure reflects the likelihood of beneficiaries having unplanned readmissions in the year. We used CMS's risk-standardized all condition readmission measure for ACOs (ACO #8) to *identify* eligible hospitalizations and unplanned readmissions.[9]

NOTE: For providers in ACOs who opted for population-based payments (PBP) or all-inclusive-population-based-payments (AIPBP), we used the actual amount Medicare would have paid for services absent the population-based payments.

Appendix D.7: Analytic Approach to Estimating Impact

In this section, we describe the specification of our difference-in-differences (DID) regression models to assess the impact of the VTAPM on claims-based outcomes and provide the rationale and tests we used to guide various analytic decisions.

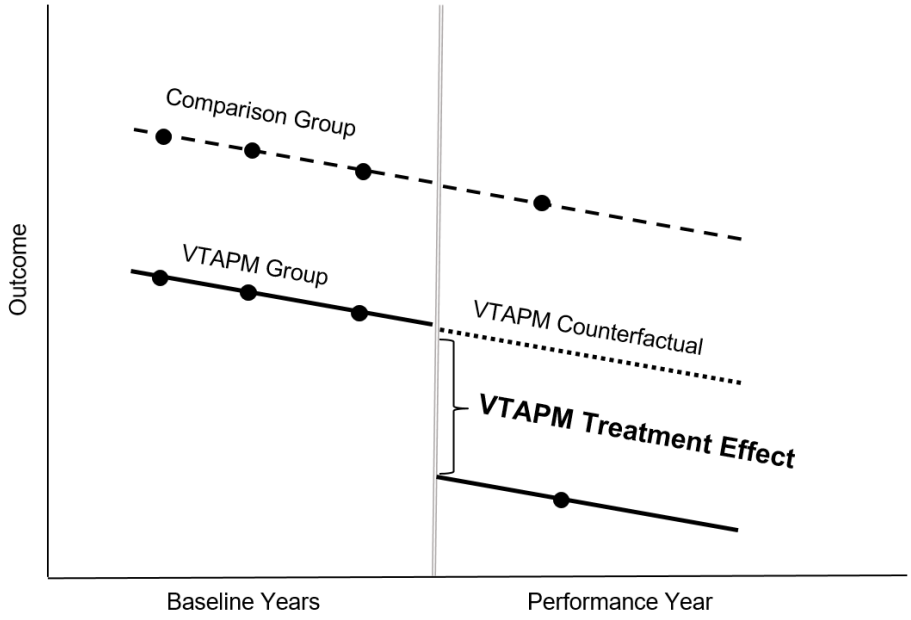
Difference-in-Differences Estimation

Using the DID design, we assessed the impact of VTAPM in PY1 and PY2 for both the ACO-level and state-level analyses. The design compares differences in outcomes for the VTAPM and EB-weighted comparison beneficiaries in PY1 and PY2, against differences in outcomes for the treatment and comparison groups in three preceding baseline years (BY3, BY2, and BY1). The comparison group is used to obtain an appropriate counterfactual of what would have happened to the VTAPM beneficiaries in PY1 and PY2, in the absence of the model. The DID models net out time-invariant unobservable factors that influence the VTAPM and comparison groups. Together with EB weights, this approach mitigates biases from unobserved differences between the VTAPM and comparison group.

As shown in **Appendix Exhibit D.7.1**, DID compares differences in outcomes for the VTAPM and propensity-score weighted comparison beneficiaries in a given P1, to differences in outcomes for the treatment and comparison groups in BY3, BY2, and BY1.

[9] Centers for Medicare & Medicaid Services. A Blueprint for the CMS Measures Management System, ACO #8 Risk Standardized All Condition Readmission, Version 1.0, 2012. https://www.cms.gov/Medicare/Medicare-Fee-for-Service-Payment/sharedsavingsprogram/Downloads/Measure-ACO-8-Readmission.pdf.

Appendix Exhibit D.7.1: Difference-in-Differences Estimation of the VTAPM Treatment Effect



Estimating impacts in PY1 and PY2. We estimated impacts using DID regression models for each of the state- and ACO-level analyses separately. We report impact estimates in PY1 and PY2 as relative increases or relative decreases, in relation to the VTAPM counterfactual absent the Model. Impacts for PY1 and PY2 are estimated in separate models due to the differences in Model practitioners for the ACO-level analysis, and for both the ACO- and state-level analyses, a single cumulative estimate is produced as a weighted average of the two PY-specific impact estimates. While all impact estimates are at the beneficiary-level, we describe impacts as relative increases or decreases PBPY for spending outcomes and per 1,000 BPY for utilization and quality of care outcomes. Estimates are reported at the $p<0.1$, $p<0.05$, and $p<0.01$ levels of statistical significance.

Equations D.1 and D.2 show the general specification of the DID model that we used to estimate ACO- and state-level impacts of the VTAPM in a given PY, respectively.

Equation D.1: DID model for estimating ACO-level impact in a given PY, with fixed effects for years, controlling for beneficiary, community, and practice characteristics

$$E(Y_{ijkt}) = \alpha_0 + \beta_1 VTAPM + \gamma_1 BY2 + \gamma_2 BY1 + \gamma_3 PY + \delta_1 VTAPM * PY + \sigma_1 VTAPM * YEAR + \theta_1 BENE_{ijkt} + \varphi_2 CNTY_j + \omega_2 PRAC_k + \varepsilon_{ijkt}$$

- $\alpha 0$ is the intercept, the mean outcome for the beneficiaries in the comparison group during the baseline period;

- $\boldsymbol{VTAPM}$ is the binary indicator for belonging to the treatment group. The coefficient $\boldsymbol{\beta 1}$ captures the difference between the treatment and comparison group in the baseline period;
- $\boldsymbol{BY2}$, $\boldsymbol{BY1}$, and $\boldsymbol{PY}$ represent fixed effects for each BY and PY. The coefficients $\boldsymbol{\gamma 1}$, $\boldsymbol{\gamma 2}$, and $\boldsymbol{\gamma 3}$ capture change in outcome relative to the reference period $\boldsymbol{BY3}$;
- The interaction term $\boldsymbol{VTAPM * PY}$ is the binary indicator for treatment group beneficiaries in $\boldsymbol{PY}$. The coefficient $\boldsymbol{\delta_1}$ is the DID estimate and represents the impact of VTAPM's initiatives in $\boldsymbol{PY}$ in;
- $\boldsymbol{\sigma 1\ VTAPM * YEAR}$ is the linear group-specific interaction term (treatment effect interacted with linear year), included to address the common trends assumption (see **Appendix D.8**);
- $\boldsymbol{BENE}$ and $\boldsymbol{CNTY}$ are a vector of beneficiary-level characteristics and the characteristics of their county of residence. The vectors $\boldsymbol{\theta 1}$ and $\boldsymbol{\varphi 2}$ are the coefficients associated with these characteristics;
- $\boldsymbol{PRAC_k}$ is a fixed effect for each VTAPM and SSP Track 1 practice. The coefficient $\boldsymbol{\omega_2}$ captures the practice-specific time-invariant differences; and
- $\boldsymbol{\varepsilon ijkt}$ is the random error term.

Equation D.2: DID model for estimating state-level impact in a given PY, with fixed effects for years, controlling for beneficiary and community characteristics

$$E(Y_{ijkt}) = \alpha_0 + \beta_1 VT + \gamma_1 BY2 + \gamma_2 BY1 + \gamma_3 PY + \delta_1 VT * PY + \sigma_1 VT * YEAR + \theta_1 BENE_{ijkt} + \varphi_2 CNTY_j + \varepsilon_{ijkt}$$

- Where $\boldsymbol{E(Y_{ijkt})}$ is the outcome for the $\boldsymbol{ith}$ beneficiary in the treatment or comparison group (i.e., residing in VT or a comparison county and receiving the majority of their care from within their state of residence) in year $\boldsymbol{t}$;
- $\boldsymbol{\alpha_0}$ is the intercept, the mean outcome for the beneficiaries in the comparison group during the baseline period;
- $\boldsymbol{VT}$ is the binary indicator for belonging to the treatment group. The coefficient $\boldsymbol{\beta_1}$ captures the difference between the treatment and comparison group in the baseline period;
- $\boldsymbol{BY2}$, $\boldsymbol{BY1}$, and $\boldsymbol{PY}$ represent fixed effects for each BY and PY. The coefficients $\boldsymbol{\gamma_1}$, $\boldsymbol{\gamma_2}$, and $\boldsymbol{\gamma_3}$ capture change in outcome relative to the reference period $\boldsymbol{BY3}$;
- The interaction term $\boldsymbol{VT * PY}$ is the binary indicator for treatment group beneficiaries in $\boldsymbol{PY}$. The coefficient $\boldsymbol{\delta 1}$ is the DID estimate and represents the impact of VT's statewide initiatives in $\boldsymbol{PY}$;
- $\boldsymbol{\sigma 1\ VTAPM * YEAR}$ is the linear group-specific interaction term (treatment group interacted with linear year), included to address the common trends assumption (see **Appendix D.8**);
- $\boldsymbol{BENE}$ and $\boldsymbol{CNTY}$ are vectors of beneficiary-level characteristics and the characteristics of county of residence. The vectors $\boldsymbol{\theta_1}$ and $\boldsymbol{\varphi_2}$ are the coefficients associated these characteristics; and

- ε_{ijkt} is the random error term.

We include the following covariates in both the ACO- and state-level regression model:

- **Beneficiary-level covariates** include age; gender, race/ethnicity; disability; ESRD status; dual-eligibility; Part D coverage; number of months of alignment in the year; death in the year; and disease burden at the end of the preceding year (using indicators for 62 chronic conditions); flag for utilization of long-term care; and an indicator for whether a beneficiary was aligned using primary or specialty care visits.
- **ZCTA-level covariates** include number of alignment-eligible providers within 10 miles per 1,000 population, percent of population with a high school degree, percent with a bachelor's degree, percent below the federal poverty level, rurality, rural-urban continuum code, percent of population unemployed, percent of population uninsured, percent of population receiving Supplemental Security Income, and median household income.
- **County-level covariates** include total population; number of hospital beds per 1,000 population; number of active MDs per 1,000 population; number of RHCs per 1,000 population; number of FQHCs per 1,000 population; number of physician assistants per 1,000 population; number of nurse practitioners per 1,000 population; number of certified nursing specialists per 1,000 population; number of hospital-based primary care physicians per 1,000 population; number of office-based primary care physicians per 1,000 population; U.S. Department of Agriculture Economic Research Service economic typology code; HRSA health professional shortage area (HPSA) code; mental health HPSA code; and rate of participation ACOs with downside risk.
- **Year-level covariates** include binary indicators for year.

The ACO-level model also included a fixed effect for practice, grouping all practices who saw fewer than 500 attributed BPY. Both ACO- and state-level models include the previously described EB weights for the comparison group; all VTAPM group beneficiaries receive a weight of one. We provide details of the estimation of the models based on Equations D.1 and D.2. All models were estimated using Stata 16.[10]

Modelling Outcomes of Spending, Utilization, and Quality of Care

Appendix Exhibit D.7.2 summarizes the models used for the 15 claims-based outcome measures for the state- and ACO-level analyses for PY1 and PY2. Outcome measures for spending and utilization were modelled as continuous variables, using generalized linear models (GLM). For outcomes where more than 15 percent of the sample had zero values, we used two-part models (TPMs), with a probit model to assess the likelihood of a non-zero outcome and

[10] StataCorp. 2019. *Stata Statistical Software: Release 14*. College Station, TX: StataCorp LP.

GLM to assess levels of the outcome for those with non-zero outcomes. We determined the appropriate distributional form using a modified Park test.[11] The modified Park test examines the heteroscedasticity of the error term to ascertain the appropriate distribution; we ran the test using all observations for outcomes with GLMs, and using only non-zero observations for outcomes with TPMs. The two quality of care measures were modelled as binary measures.[12] All models utilized standard errors clustered at the state level and included a log link.

Appendix Exhibit D.7.2: Model Specifications for Outcome Measures

Outcome Measure	PY1		PY2	
	ACO	State	ACO	State
Total Medicare spending	GLM Gaussian	GLM Gamma	GLM Gamma	
Acute care stays	TPM Poisson	TPM Gamma	TPM Inv. Gaussian	
Acute care days	TPM Inv. Gaussian		TPM Inv. Gaussian	
ED visits	TPM Gaussian	TPM Inv. Gaussian	TPM Inv. Gaussian	TPM Poisson
Primary E&M visits	GLM Gaussian		GLM Poisson	
Specialist E&M visits	GLM Gaussian	GLM Poisson	GLM Poisson	GLM Gamma
SNF stays	TPM Inv. Gaussian		TPM Inv. Gaussian	
SNF days	TPM Gaussian	TPM Poisson	TPM Gamma	
HH visits	TPM Inv. Gaussian		TPM Inv. Gaussian	
HH episodes	TPM Inv. Gaussian		TPM Inv. Gaussian	
Hospice days	TPM Gaussian		TPM Poisson	
Imaging, procedures, tests	GLM Gaussian		GLM Poisson	
AWVs	Logit		Logit	
ACS hospitalizations	Logit		Logit	
Unplanned 30-day readmissions	Logit		Logit	

NOTE: GLM=generalized linear model; TPM=two-part model.

[11] W. Manning and J. Mullahy, "Estimating Log Models: To Transform or Not to Transform?" *Journal of Health Economics* 20 (2001): 461-494.

[12] A Medicare beneficiary is eligible for a single wellness visit annually. For ACSC hospitalizations, unplanned 30-day hospital readmissions, and unplanned hospitalizations 30-day post SNF readmissions, few beneficiaries had events (4.9 percent for ACS hospitalizations, 16.6 percent for 30-day readmissions, and 18.9 percent for 30-day post-SNF readmissions), and fewer had more than one event. We chose to model these as binary measures, whether or not the beneficiary had the event during the year. We tested that our conclusions were robust to modelling the latter three measures as counts.

Post-estimation calculations. We performed the following four post-estimation calculations:

- Because we used non-linear models for the outcome variables, we employed the approach suggested by Puhani (2012) to express the DID δ_1 coefficient in Equation D.1 and D.2 as the estimated outcome for the treated VTAPM group relative to its expected outcome absent the treatment.[13] We calculated these results using post-estimation predictions, computing the marginal effect for all treated beneficiaries and subtracting the marginal effect for these beneficiaries with the DID interaction term set to zero.[14] We computed confidence intervals using the delta method.[15]
- We expressed the estimated impact as a percent of the expected outcome for the VTAPM group in a given PY absent the model. We computed the percentage change from the DID coefficient for outcomes estimated with log-linear models.[16] For outcomes estimated with two-part models, we computed the predicted level of outcomes for VTAPM beneficiaries in the PY absent VTAPM incentives by summing the adjusted mean for the comparison group in the PY and the adjusted difference between the VTAPM and the comparison group in the BYs.[17] We obtained the latter from the average predicted and adjusted outcomes for the VTAPM and comparison group in the BYs, which we calculated post-estimation.
- We used post-estimation marginal effects to predict the average adjusted outcomes (e.g., the conditional means) for the VTAPM and comparison group in the baseline period (all BYs) and PY. We report these for the VTAPM and comparison group in **Appendix H**, alongside the impact estimates to understand if the latter were driven by improved performance for the VTAPM group or deteriorating performance for the comparison group, or both.
- Finally, we expressed impact estimates for measures of spending and utilization from our annual models as per beneficiary per year (PBPY) and per 1,000 beneficiaries per year (BPY), respectively.

[13] P. A. Puhani, "The Treatment Effect, the Cross Difference, and the Interaction Term in Nonlinear 'Difference-in-Differences' Models," *Economics Letters*, 115 no. 1 (2012): 85-87.

[14] Pinar Karaca-Mandic, Edward C. Norton, and Bryan Dowd, "Interaction Terms in Nonlinear Models," *Health Services Research* 47, no. 1pt1 (2012): 255-274.

[15] Bryan E. Dowd, William H. Greene, and Edward C. Norton, "Computation of Standard Errors," *Health Services Research* 49, no. 2 (2014): 731-750.

[16] For a log-linear model with a dummy variable D: $ln[E(Y)] = a + bX + cD + \varepsilon$; if D switches from 0 to 1, then the percentage impact of D on Y is $100[exp(c) - 1]$, where c is the coefficient on the dummy variable.

[17] J. McWilliams, Laura A. Michael, M. E. Hatfield, Michael E. Chernew, Bruce E. Landon, and Aaron L. Schwartz, "Early Performance of Accountable Care Organizations in Medicare," *New England Journal of Medicine* 374, no. 24 (2016): 2357-2366.

Appendix D.8: Assessment of Common Baseline Trends

A key assumption of the DID design is that the VTAPM and the comparison group had similar trends in outcomes during the baseline years before the start of VTAPM. This assumption of common trends allows the comparison group to establish a reliable representation of the VTAPM group in a given PY in the absence of the VTAPM model. We tested this assumption using two methods (see **Appendix H** for results from these two methods):

- Equation D.3 shows the specification of a model to estimate the average marginal effect for VTAPM in BY1 relative to BY3. We assessed whether the coefficient θ_{-2} for the leading interaction term in BY1 was significantly different from zero ($p<0.05$). If this was significantly different, the assumption of common trends did not hold.

Equation D.3: Test of common trends via estimation of VTAPM's average marginal effect in BY1 over BY3

$$E(Y_{ijkt}) = \alpha_0 + \beta_1 VTAPM + \gamma_1 BY2 + \gamma_1 BY1 + \gamma_1 PY + \theta_{-2} VTAPM_j * BY1_t + \theta_1 VTAPM_j * PY_t + \theta_1 BENE_{ijkt} + \varphi_2 CNTY_j + \varepsilon_{ijkt}$$

- To mitigate the effect of non-common trends between the VTAPM and comparison groups, we included a term $\sigma 1\ VTAPM * YEAR$ (linear year*treatment interaction term) in our DID models (see Equations D.1 and D.2). As an additional check for common trends, we assessed whether the coefficient σ_1 for the interaction term was significantly different from zero ($p<0.05$). In **Appendix Exhibits I.13-I.16**, we indicate outcomes for which the coefficient was significant using a † symbol.

Appendix D.9: Net Impact Estimation

In addition to estimating the gross impact of the VTAPM model on total Medicare Parts A and B spending, we also calculate the net spending impact of the VTAPM by accounting for incentive payments from CMS for shared savings or losses for VTAPM and comparison practitioners in the baseline and performance years. Incentive payments estimated for the treatment and comparison group populations include the following:

- **Treatment providers, PY**: MAPCP incentives received during the PY + Shared savings/losses for treatment practitioners in the PY.
- **Treatment providers, BYs**: MAPCP incentives received during the BYs + Shared savings/losses for treatment practitioners who participated in the SSP, Pioneer, or NGACO Models in the BYs.
- **Comparison providers, PY**: Shared savings/losses paid to comparison practitioners who participated in the SSP, Pioneer, or NGACO in the PY.

- **Comparison providers, BYs**: Shared savings/losses paid to comparison practitioners who participated in the SSP, Pioneer, or NGACO Models in the BYs.

The $9.5 million in Medicare start-up funding provided by CMS in the 2017 cooperative payment agreement is not included in the net spending estimation. **Appendix Exhibit D.9** shows the total PBPY dollar amount of CMS incentive payment amounts that are included in the net impact estimation for the ACO- and state-level analyses in PY1 and PY2.

Appendix Exhibit D.9: Estimated CMS Incentive Payments for VTAPM and Comparison Practitioners, PBPY

		PY1		PY2	
		BYs	PY	BYs	PY
ACO	**VTAPM**	$100.69	$236.82	$100.69	$158.83
	Comparison	$39.81	$52.00	$32.30	$47.79
State	**VTAPM**	$101.11	$166.32	$101.11	$138.17
	Comparison	$16.42	$29.64	$16.52	$43.72

NOTE: All estimates are $PBPY in 2019 USD. Net incentive payments for VTAPM in each PY are the VTAPM group's incentive payments (PY-BYs) minus the comparison group's incentive payments (PY-BYs).

To estimate PBPY incentives for VTAPM providers in the baseline and comparison providers in the baseline and performance years, we used the following methods:

- For the ACO-level analysis, we identified beneficiaries attributed by the ACO-level concurrent alignment receiving a meaningful level of care during a year from providers participating in SSP, Pioneer, or NGACO Models, then applied the PBPY incentive costs associated with each provider TIN/CCN using publicly available data on annual shared savings/losses incurred by providers in CMS models.
- For the state-level analysis, we identified beneficiaries attributed by the state-level concurrent alignment who were also attributed to Medicare ACOs based on the CMS MDM file, then linked the data to publicly available data on annual shared savings/losses for those ACOs at the beneficiary level.

We weighted PBPY estimates for both the ACO- and state-level analyses using the analytic entropy balancing weights. To calculate the net incentive amount, we subtracted the PY-BY difference in the comparison group from the PY-BY difference in the treatment group. The net incentive amount is subtracted from the gross Medicare spending estimate to calculate the net Medicare spending estimate presented in the report.

Appendix D.10: Sensitivity Analyses

We conducted the following sensitivity tests to assess the robustness of our estimates to different assumptions in PY1 and PY2:

- **Cap spending at 99th percentile** – We capped the Medicare spending outcome at the 99th percentile to assess the robustness of the impact estimates to the possibility of random variation in the highest spenders between the VTAPM and comparison group.
- **Alternative model distribution** – Instead of using the distribution recommended by the Park test, we used the second-best distribution, which was Poisson for both the ACO- and state-level analyses. This tests the robustness of our results to different distributional assumptions.
- **No linear interaction term** – We removed the linear interaction term from the DID model statement, which accounts for differences in the linear trend in the baseline period between the treatment and comparison groups.
- **Include CY 2017 as baseline** – In the main model, we drop CY 2017 because it is seen as a ramp-up year from a program implementation standpoint, and a period in which we would not expect to see the benefits of the model. For this sensitivity analysis, we include CY 2017 and consider it in the model as a fourth year in the baseline period.
- **Include upside ACO rate covariate** – We added a covariate to the DID model statement representing the percent of beneficiaries in a county who participated in an ACO with upside risk.
- **Include MA rate covariate** – We added a covariate to the DID model statement representing the percent of beneficiaries in a county who had one or more months of MA coverage.

Appendix Exhibits D.9 and D.10 present the findings from each of these analyses for PY1 and PY2, respectively. While we observe a moderate amount of variation from the results of the main DID model presented in this report, findings were overall similar to the main findings and showed no significant impact of VTAPM on total Medicare spending.

Appendix Exhibit D.9.1: Sensitivity Analyses for Total Medicare Spending, PY1

	DID Estimate	VTAPM Change	Comp. Change	90% CI	% Impact	p
ACO-Level Analysis						
Main model	-360.11	▼	▼	-1343.33, 623.12	-3.39	0.547
Cap spending at 99th percentile	-485.76	▼	▼	-1212.70, 241.18	-4.73	0.272
Alternative model distribution	-369.37	▼	△	-921.52, 182.80	-3.69	0.271
No linear interaction term	183.12	△	▼	-222.38, 588.62	1.82	0.458
Include CY 2017 as baseline	-445.40	▼	▼	-1181.35, 290.55	-4.13	0.319
Include upside ACO rate covariate	-401.56	▼	▼	-1558.97, 755.84	-3.77	0.568
Include MA rate covariate	-353.64	▼	▼	-1324.14, 616.86	-3.37	0.549
State-Level Analysis						
Main model	-382.66 †	▼	△	-858.90, 93.57	-3.39	0.186
Cap spending at 99th percentile	-333.29 †	▼	△	-724.19 57.61	-3.10	0.161
Alternative model distribution	-401.21* †	▼	△	-798.16 -4.26	-3.80	0.096
No linear interaction term	77.91	△	△	-106.43 262.25	0.72	0.487
Include CY 2017 as baseline	159.51	△	△	-145.57 464.59	1.48	0.390
Include upside ACO rate covariate	-145.53	△	△	-648.42 357.35	-1.30	0.634
Include MA rate covariate	-381.23 †	▼	△	-865.55 103.10	-3.38	0.195

NOTE: Impacts are PBPY, in 2019 USD. Asterisks denote significance at *p<0.10, **p<0.05, ***p<0.01. Difference columns indicate whether the average adjusted outcome increased or decreased from the BY to PY1. † indicates that the coefficient for the linear interaction term was significant, which indicates diverging trends in the baseline period between the VTAPM and comparison groups.

Appendix Exhibit D.9.2: Sensitivity Analyses for Total Medicare Spending, PY2

	DID Estimate	VTAPM Change	Comp. Change	90% CI	% Impact	p
ACO-Level Analysis						
Main model	-793.39*	▼	△	-1526.58, -60.20	-6.94	0.075
Cap spending at 99th percentile	-809.08*	▼	△	-1521.26, -96.90	-7.39	0.062
Alternative model distribution	-884.42*	▼	△	-1687.96, -80.87	-8.20	0.070
No linear interaction term	-274.56*	▼	△	-547.36, -1.76	-2.52	0.098
Include CY 2017 as baseline	-577.32	▼	△	-1228.38, 73.74	-5.15	0.145
Include upside ACO rate covariate	-1083.68**	▼	△	-1971.28, -196.09	-9.28	0.045
Include MA rate covariate	-731.34	▼	△	-1497.24, 34.56	-6.51	0.116
State-Level Analysis						
Main model	-1181.57*** †	▼	△	-1819.02, -544.13	-10.02	0.002
Cap spending at 99th percentile	-964.17***	▼	△	-1472.36, -455.98	-8.66	0.002
Alternative model distribution	-1056.47***	▼	△	-1503.97, -608.96	-9.57	0.000
No linear interaction term	-484.11***	▼	△	-751.30, -216.92	-4.36	0.003
Include CY 2017 as baseline	-426.60***	▼	△	-678.25, -174.95	-3.87	0.005
Include upside ACO rate covariate	-800.73**	▼	△	-1444.56, -156.90	-6.95	0.041
Include MA rate covariate	-1171.37***	▼	△	-1833.67, -509.07	-9.97	0.004

NOTE: Impacts are PBPY, in 2019 USD. Asterisks denote significance at *p<0.10, **p<0.05, ***p<0.01. Difference columns indicate whether the average adjusted outcome increased or decreased from BY to PY1. † indicates that the coefficient for the linear interaction term was significant, which indicates diverging trends in the baseline period between the VTAPM and comparison groups.

Appendix E. Methodological Challenges in Comparison Group Construction

In this section, we detail methodological challenges for constructing comparison groups to evaluate the impact of the VTAPM at the ACO and state levels and the evaluation design strategies we used to mitigate these challenges. Vermont is distinct from most U.S. states with respect to sociodemographic and health-care market characteristics. Because the VTAPM's reach is expected to span the entire state, we deemed a within-state comparison group to be infeasible. Our overall approach for creating comparators to evaluate the VTAPM's impacts was to use *multiple states* with similar health-care reform histories[18] as Vermont, emphasizing areas within those states that were most similar to Vermont, and persons within those areas who were similar to Vermonters.

We organize this section as follows: First, we show how Vermont's sociodemographic and health-care market characteristics differ from the rest of the nation. Second, we describe the design and implementation of two approaches for creating comparison groups to assess the Model's impact in PY1. Third, we examine the relative merits of the two comparison group designs to address methodological challenges and implement further design refinements to finalize the evaluation's comparison groups. We conclude by summarizing lessons learned from exploring alternative ways to construct comparison groups for the VTAPM evaluation.

Appendix E.1: Vermont's Distinct Area-Level Characteristics

This section provides the context and empirical evidence for understanding methodological challenges associated with constructing a comparison group for Vermont. We consider area-level sociodemographic and health-care market characteristics related to demand and supply of health services, respectively, when constructing the comparison group. We expect these area-level characteristics to influence outcome measures of spending, utilization, and quality of care that the Model is expected to impact. **Appendix Exhibit E.1.1** presents the area-level factors used to identify areas outside of Vermont to serve as the comparison pool.

[18] The PCMH and Multi-Payer ACO models served as the key building blocks for the VTAPM. Therefore, the comparison group includes states that implemented these initiatives in the baseline period. See **Appendix Exhibit D.2.1** for the list of selected comparison states.

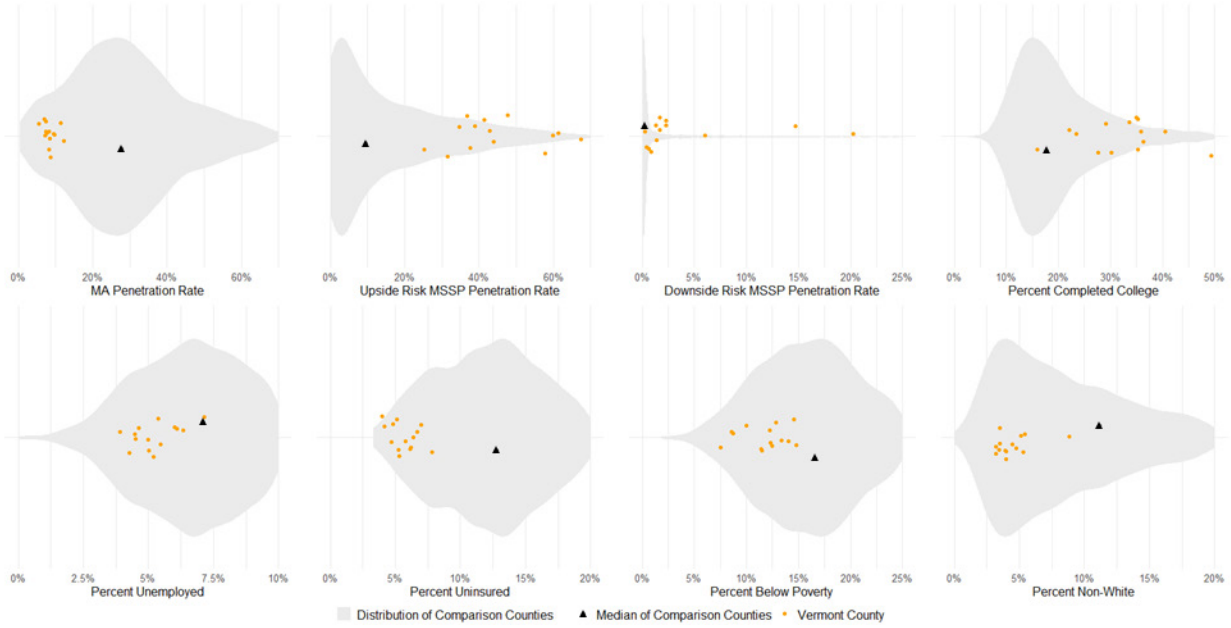
Appendix Exhibit E.1.1: Area-Level Sociodemographic and Health-Care Market Characteristics

Domain	Factors
Sociodemographic Factors	Population Density—RUCC Classification
	Education—High School and College Completion Rates
	Poverty Rate
	Median Household Income
	Unemployment Rate
Health Insurance Market Characteristics	MA Penetration Rate
	Uninsured Rate
	Upside and Downside Risk Medicare SSP Penetration Rate
Health Services Availability	Active Physicians per 100k Pop.
	Primary Care Physicians per 100k Pop.
	Non-Physician Primary Care Practitioners per 100k Pop.
	Health Centers per 100k Pop.
	Hospital Beds per 100k Pop.

As shown in **Appendix Exhibit E.1.2**, counties in Vermont tend to be outliers when compared to counties located in states where we intended to draw the comparison pool.[19] Vermont's counties are likely to have populations that are whiter, more educated, less poor, more employed, less uninsured, have lower MA penetration, and greater Medicare SSP ACO penetration relative to the pool of comparison counties. As a result, the size of the potential comparison pool may be very limited.

[19] We limited the pool of comparison states to those that had a reform history similar to Vermont's during the baseline period. Details about implementation are provided in the following sections.

Appendix Exhibit E.1.2: Sociodemographic and Health-Care Market Characteristics of Counties in Vermont Differ Distinctly from Counties in Comparison States



Because few areas outside Vermont matched the profile of Vermont's counties, we explored two alternative methods for maximizing the use of the available comparison pool for constructing the comparison group. As shown in **Appendix Exhibit E.1.3**, the following are key differences of Method #2 when compared to Method #1:

1. The comparison pool includes all eligible beneficiaries residing in the comparison states.
2. Beneficiaries in Vermont and the comparison pool are balanced on beneficiary-level as well as area-level factors in the beneficiary-level EB model.

Appendix Exhibit E.1.3: Similarities and Differences in Comparison Group Approaches

Stage	Method #1 Matching Comparison Areas	Method #2 Weighting Comparison Areas
Stage 1: Selection of Comparison States	States with a reform history similar to Vermont's are included in the comparison pool.	
Stage 2: Selection of Regions within Comparison States	Vermont counties were matched to counties[20] within comparison states to account for area-level sociodemographic and health-care market factors.	A stratified random sample representing the **entire population of eligible beneficiaries residing in the comparison states** were included in the comparison pool.
Stage 3: Attribution of Comparison Pool Beneficiaries to the Comparison Group	Comparison pool beneficiaries who met the claims-based attribution criteria were included in the comparison groups.	
Stage 4: Construction of the Weighted Comparison Group	The comparison group was weighted to ensure that comparison beneficiaries are, on average, similar to treatment group beneficiaries with respect to their baseline demographic characteristics, Medicare benefits, health status, and sociodemographic characteristics of ZIP codes in which they reside.	The comparison group was weighted to ensure that comparison beneficiaries are, on average, similar to the treatment group beneficiaries with respect to their baseline demographic characteristics, Medicare benefits, health status, **and sociodemographic and health-care market characteristics of counties[21] and ZIP codes in which they reside.**

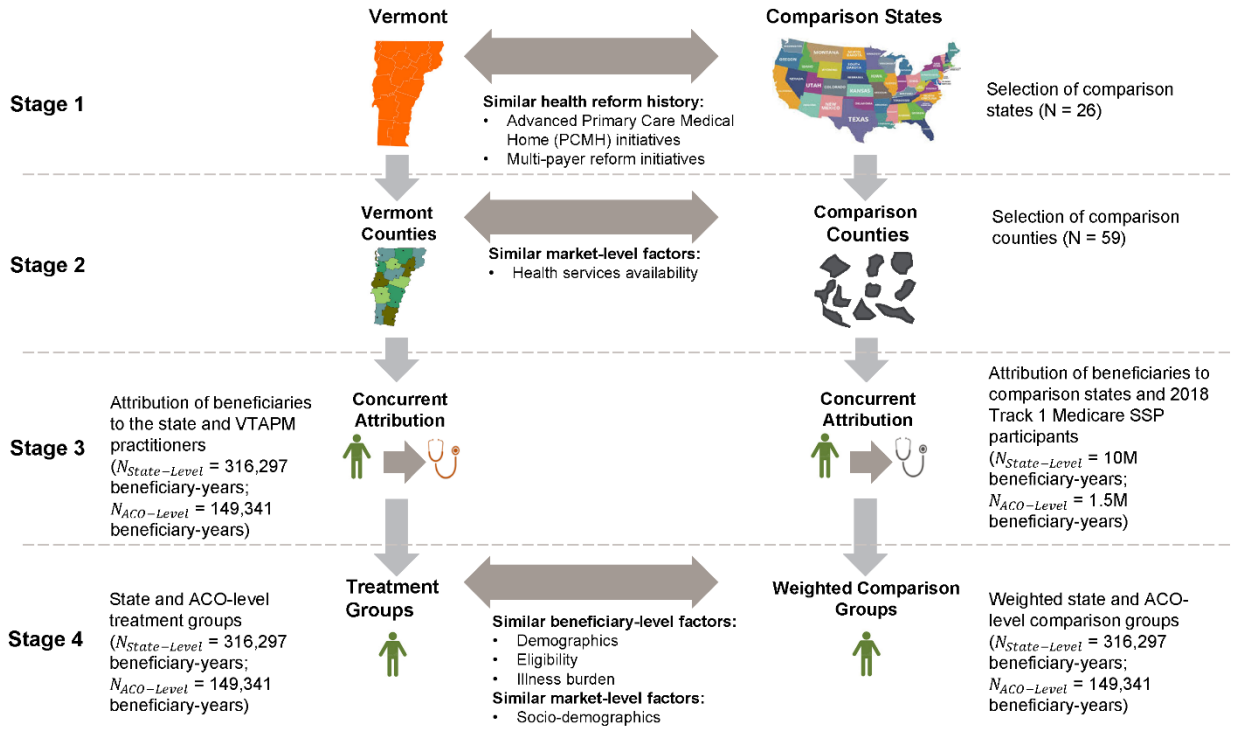
[20] We use counties to select regions within comparison states because it is the best proxy for Vermont's HSAs—a custom geographic definition that does not perfectly align with any standard geographic unit.

[21] We defined baseline county-level variables pre-implementation for both Vermont and comparison counties because VTAPM could potentially influence Vermont's county-level variables post-implementation.

Appendix E.2: Design and Implementation of Comparison Groups, Method #1

Appendix Exhibit E.2.1 summarizes our original approach to creating the comparison group for the evaluation, which involved five stages, as described below.

Appendix Exhibit E.2.1: Comparison Group Design, Method #1



NOTE: Multi-payer initiatives include the following: State Innovation Model (SIM); Multi-Payer Advanced Primary Care Program (MAPCP).

Stage 1—Selection of Comparison States. We selected 26 states with health reform initiatives relevant to the evolution of the VTAPM, such as the Advanced PCMH Model, the SIM Initiative, or the Multi-Payer Advanced Primary Care Demonstration. **Appendix Exhibit D.2** lists the states selected for inclusion in the comparison pool.

Stage 2—Selection of Counties within Comparison States. We employed propensity score matching (PSM) with replacement to select 59 counties from a pool of 1,758 counties in comparison states (see **Appendix Exhibit E.2.2**).

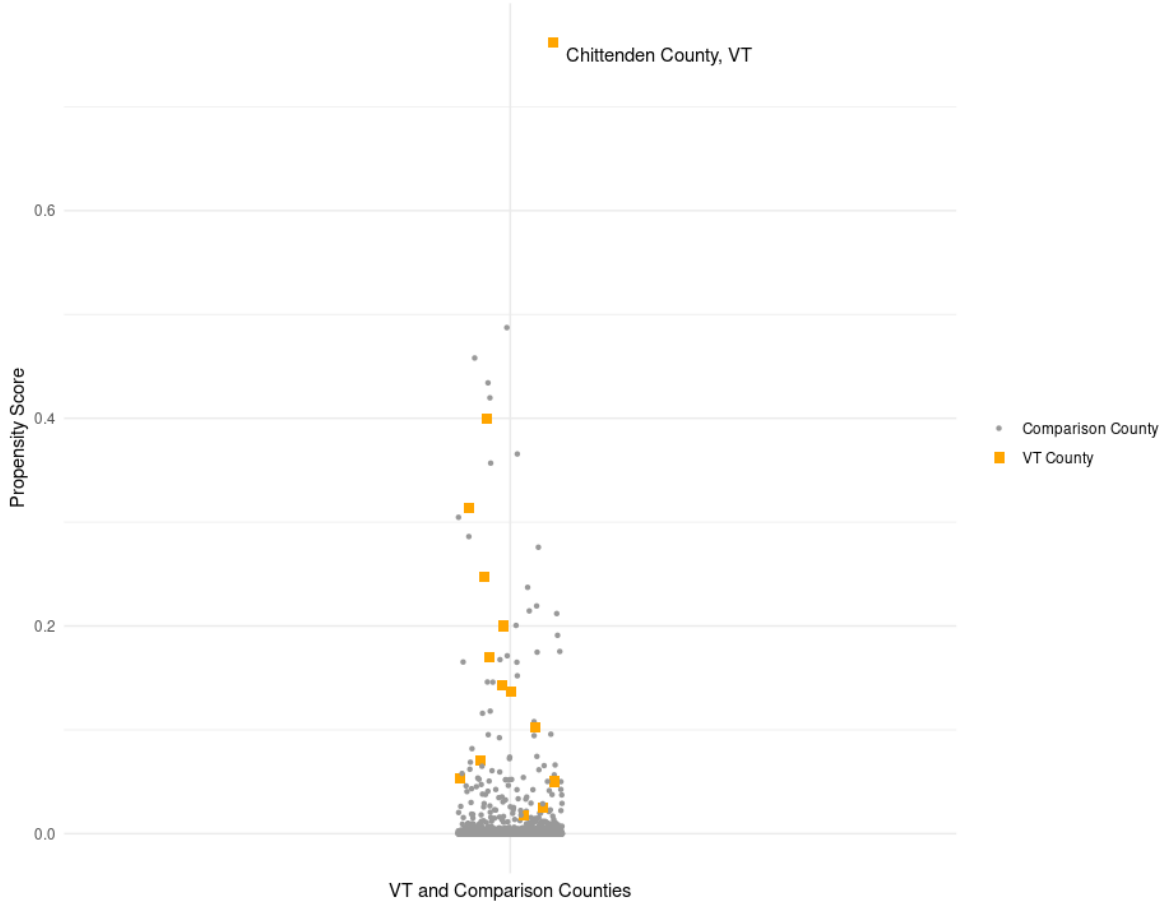
Appendix Exhibit E.2.2: Matched Comparison Counties

Vermont County	Matched Comparison Counties
Addison	Prowers, CO; Olmsted, MN; La Plata, CO; Reynolds, MO; Carter, MO
Bennington	Clay, IA; Lewis, ID; Lassen, CA; Johnson, IA; Routt, CO
Caledonia	Pitkin, CO; Albany, WY; Whitman, WA; Carter, MO; Mendocino, CA
Chittenden	Charleston, SC; Multnomah, OR; Cuyahoga, OH; Williamson, TN; Pitt, NC
Essex	Cerro Gordo, IA; Sublette, WY; Sutter, CA; Bent, CO; Los Alamos, NM
Franklin	Chowan, NC; Tehama, CA; Sweetwater, WY; Teton, WY; Gunnison, CO
Grand Isle	Hancock, IA; Dickinson, IA; Hood River, OR; Washakie, WY; Converse, WY
Lamoille	Dukes, MA; Woodruff, AR; Goshen, WY; Holt, MO; Jefferson, WA
Orange	Clallam, WA; Decatur, IA; Los Alamos, NM; Holt, MO; Bent, CO
Orleans	Teton, ID; Mora, NM; Benewah, ID; Curry, NM; McKinley, NM
Rutland	Reynolds, MO; Fremont, WY; Johnson, IA; Lewis, ID; Prowers, CO
Washington	Adair, MO; Dare, NC; Swain, NC; Stevens, WA; Calhoun, AR
Windham	Benton, WA; Mills, IA; Lake, CA; Moffat, CO; Vernon, LA
Windsor	Jefferson, WA; Goshen, WY; Inyo, CA; Berkshire, MA; Eagle, CO

We matched each Vermont county to five comparison counties that were on average similar with respect to the availability of health services during the baseline period. For Chittenden County, where the city of Burlington is located, we used Euclidean distance scores to select comparison counties because Chittenden was outside the region of "common support" in the PSM (see **Appendix Exhibit E.2.3**).[22]

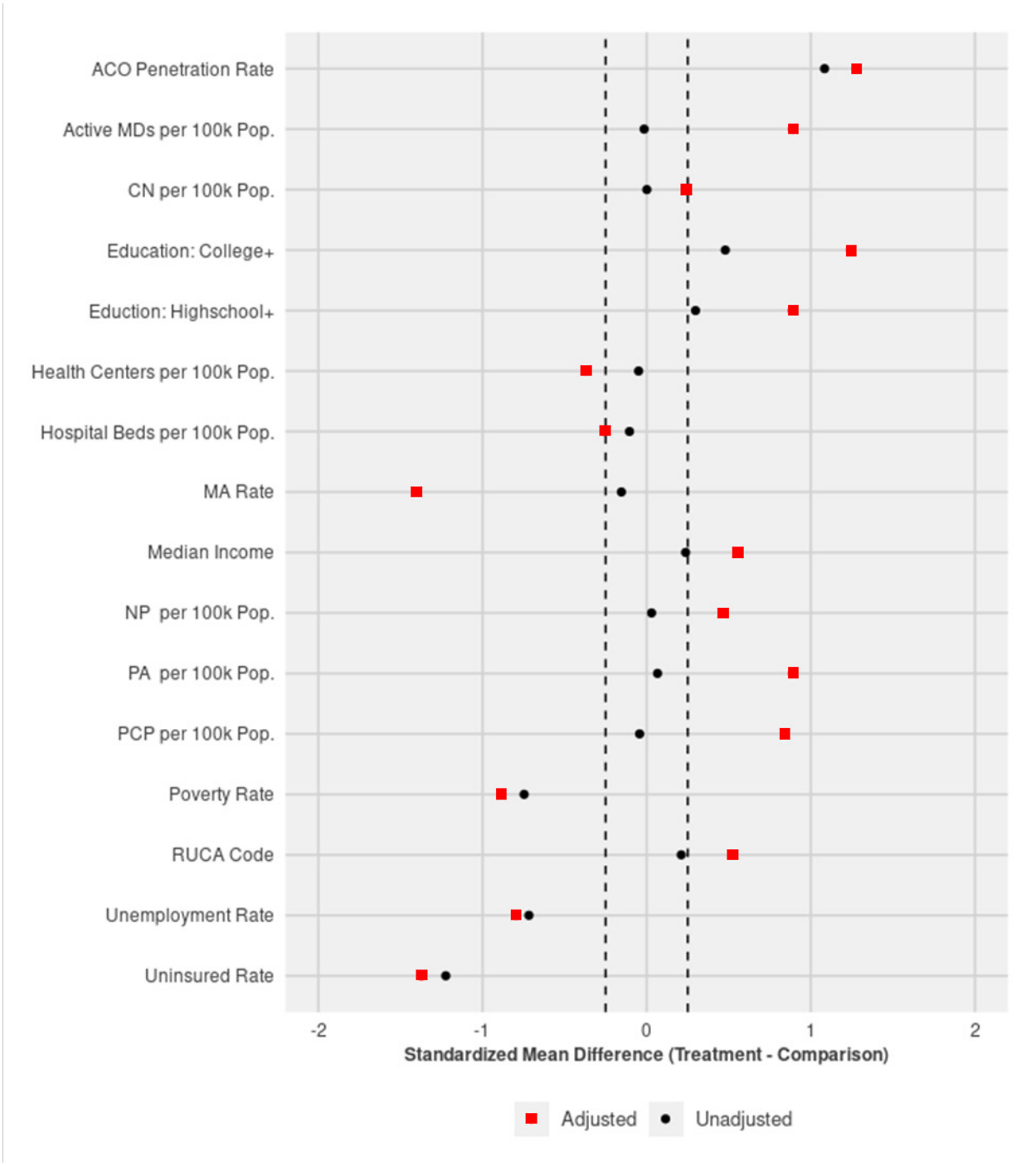
[22] Chittenden County is an outlier with a propensity score of 0.76. The comparison counties have a maximum propensity score of 0.48. Because Chittenden is an outlier compared to other counties in the state, we concluded that including Chittenden in the PSM would significantly worsen Model fit, potentially resulting in subpar matches for all counties.

Appendix Exhibit E.2.3: Common Support of the Propensity Score, Method #1



We were unable to achieve balance on all market-level health-care supply and demand characteristics because most counties in the comparison states did not match the profile of Vermont counties. **Appendix Exhibit E.2.4** presents the extent to which the matched comparison counties are similar to Vermont counties on observed market-level characteristics. The matched comparison counties have, on average, similar levels of health services availability as Vermont counties. However, we observed significant differences with respect to the following county-level sociodemographic and health insurance market characteristics: ACO penetration rate, percent uninsured, unemployment rate, poverty rate, and educational attainment. To mitigate potential bias resulting from lack of covariate balance on these market-level characteristics, we include ZCTA-level measures of these covariates in the beneficiary-level EB and multivariate regression models.

Appendix Exhibit E.2.4: Covariate Balance between Vermont Counties and Matched Comparison Counties, Method #1



SOURCE: Analysis of Medicare claims data by NORC.

NOTE: All 14 of Vermont's counties and their matched comparators are represented in this Exhibit. Dashed black lines represent ±0.25 standardized mean difference threshold.

Stage 3—Selection of Eligible Beneficiaries Residing in the Matched Comparison Counties. Beneficiaries residing in the matched comparison counties during the analytic period are included in the comparison pool.[23] Beneficiaries who did not have continuous Medicare Parts A and B coverage throughout the year or until death and those with Medicare as a secondary payer were excluded from the comparison pool. The comparison pool included 560,472 beneficiaries in PY1 (2018) and 2.7 million beneficiary years in total for the entire analytic period (2016-2018). To replicate attribution of beneficiaries to the VTAPM for the comparison group, we included all eligible comparison pool beneficiaries who received the majority of their primary care office visits from within the state from eligible practitioners during each baseline and performance period.[24] Appendix D.3 provides additional details on the claims-based algorithm employed to attribute comparison pool beneficiaries to the state-level comparison group. For the ACO-level impact analysis, we included a subgroup of comparison pool beneficiaries attributed to Medicare SSP ACO Track 1 participating providers in 2018. We applied the VTAPM's attribution algorithm instead of the Medicare SSP attribution algorithm to ensure that construction of the comparison group matches that of the treatment group. Appendix Section D.4 provides additional details on the claims-based algorithm employed to attribute comparison pool beneficiaries to the ACO-level comparison group.

Stage 4—Construction of Weighted Comparison Groups. For each baseline and performance period, we used EB[25] to construct the final weighted comparison group, which was on average similar to the treatment group in terms of baseline demographics, health status, and socioeconomic status (SES)[26] characteristics. As shown in **Appendix Exhibits E.2.5-E.2.10**, we achieved covariate balance on all observed ZCTA and beneficiary-level covariates for both the state- and ACO-level analytic populations. There are no extreme outliers in the distribution of EB weights for the Method #1 ACO- and state-level comparison pools, as shown in **Appendix Exhibit E.2.11**.

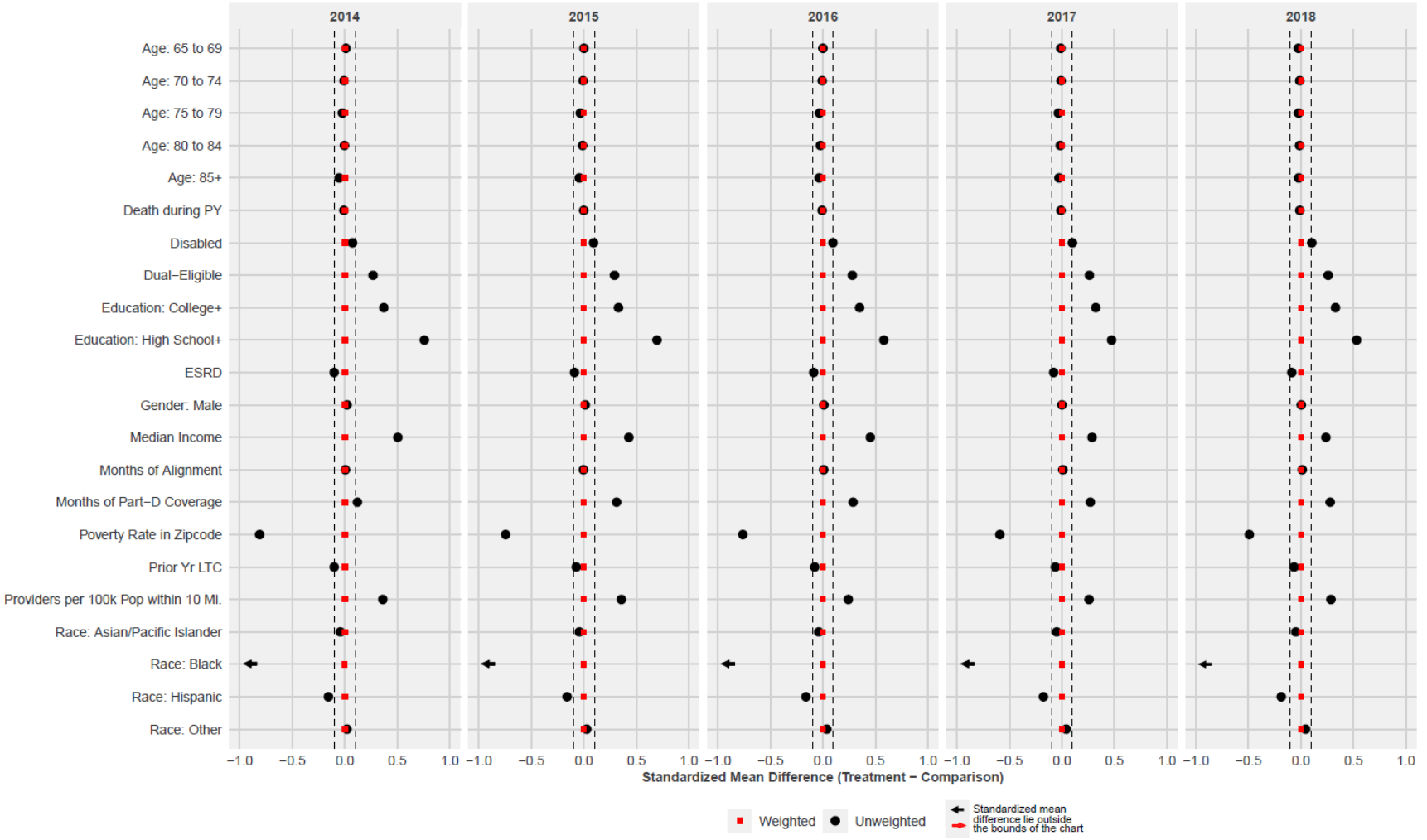
[23] We use county and ZCTA information in the Medicare Beneficiary Summary Files to determine place of residence.

[24] Practitioners serving comparison pool beneficiaries should have a specialty code that matches the list of specialties used to determine a practitioner's eligibility for participation in the VTAPM.

[25] We produced EB weights using the "ebalance" command in Stata 16. Sampling weights were set as the base weights. We then normalized the final weights to match the treatment group's sample size. The Model accommodated up to 30 iterations and the tolerance—the threshold used to determine whether the target moments matched—was set to the default of 0.01. All treatment group observations received a weight of 1.

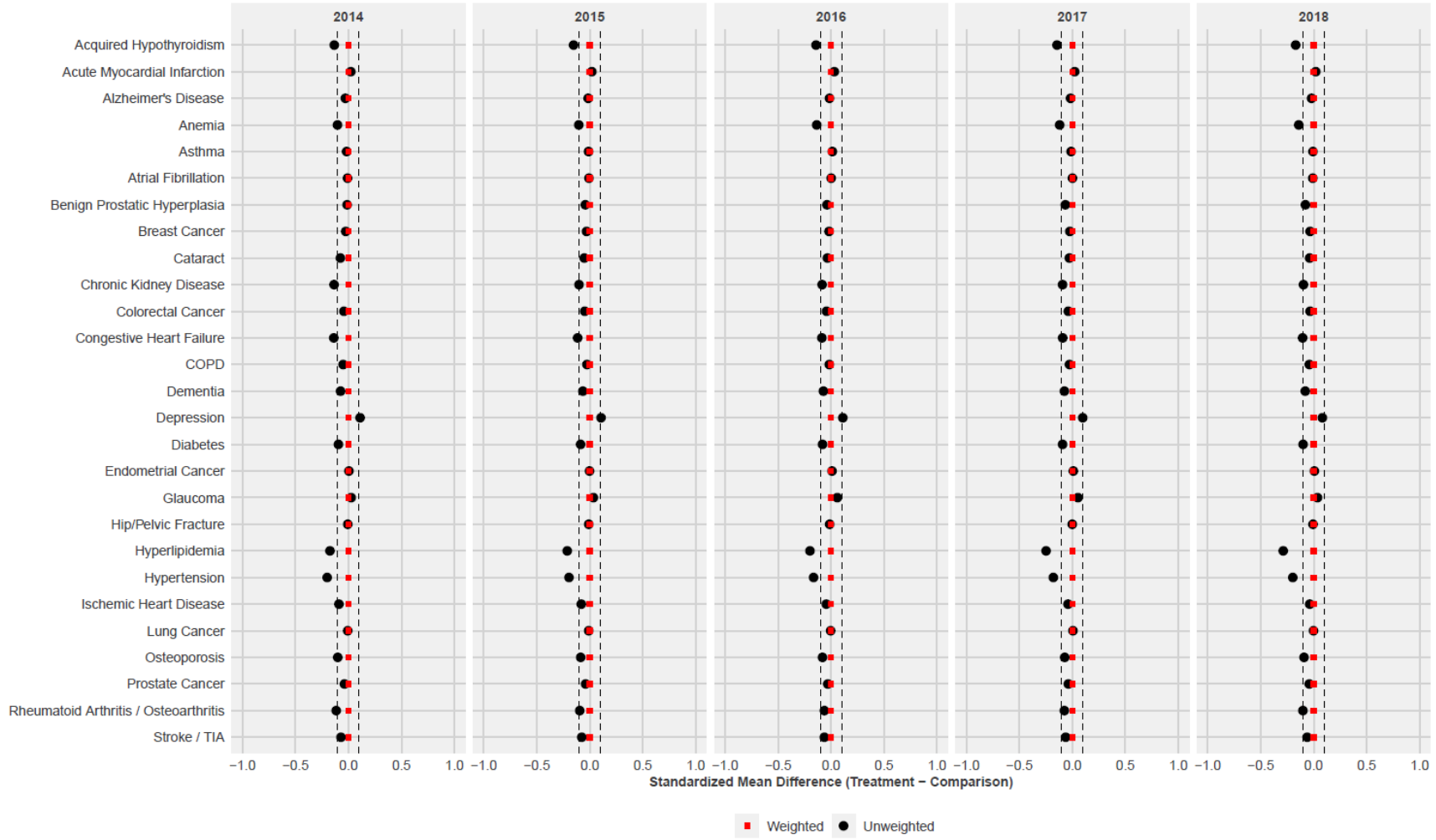
[26] We used socioeconomic characteristics of the ZIP code in which the beneficiary resided during the calendar year.

Appendix Exhibit E.2.5: ACO-Level Covariate Balance: Demographics & Medicare Eligibility, Method #1



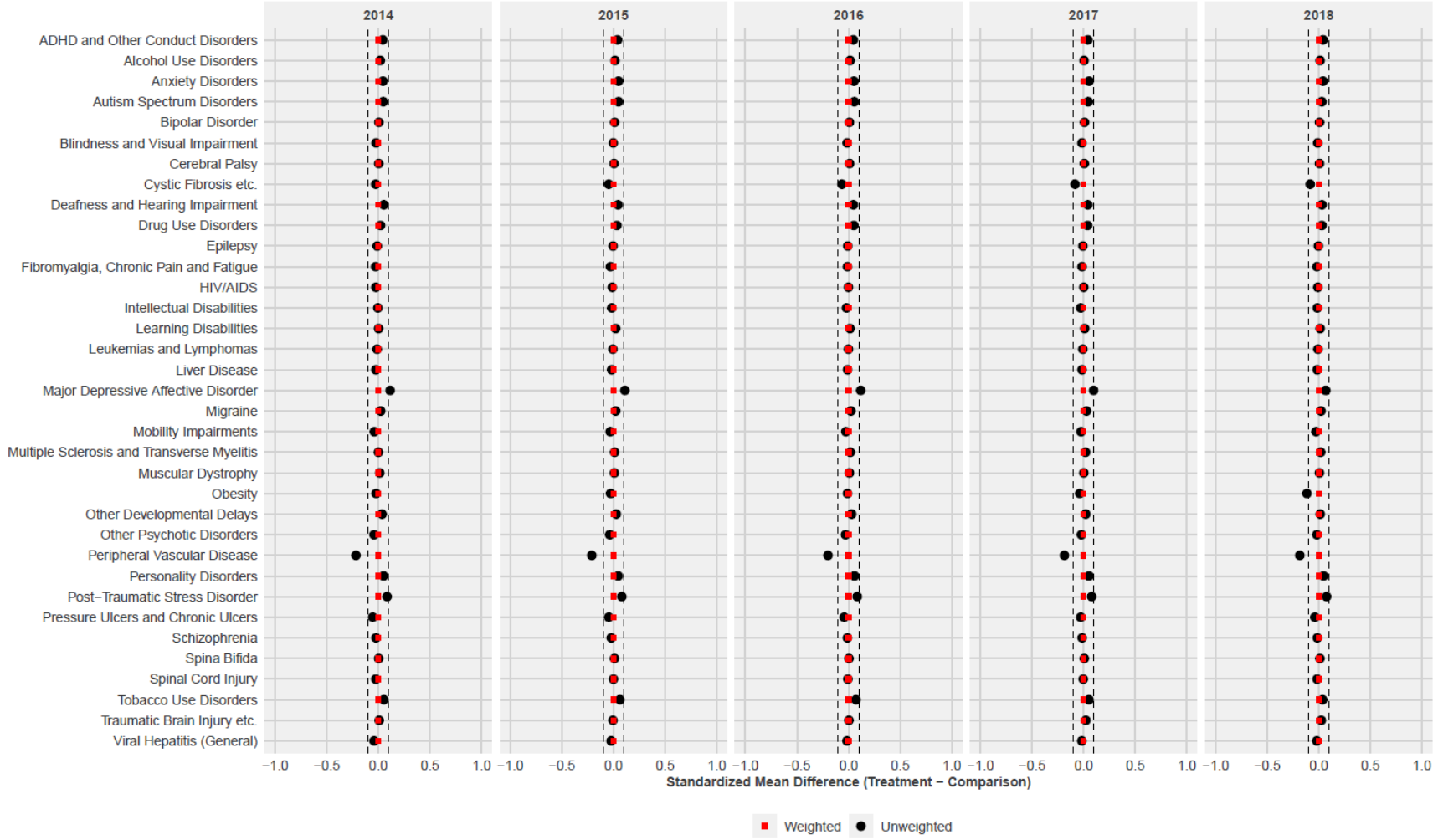
SOURCE: Analysis of Medicare claims data by NORC.

Appendix Exhibit E.2.6: ACO-Level Covariate Balance: Chronic Conditions, Method #1



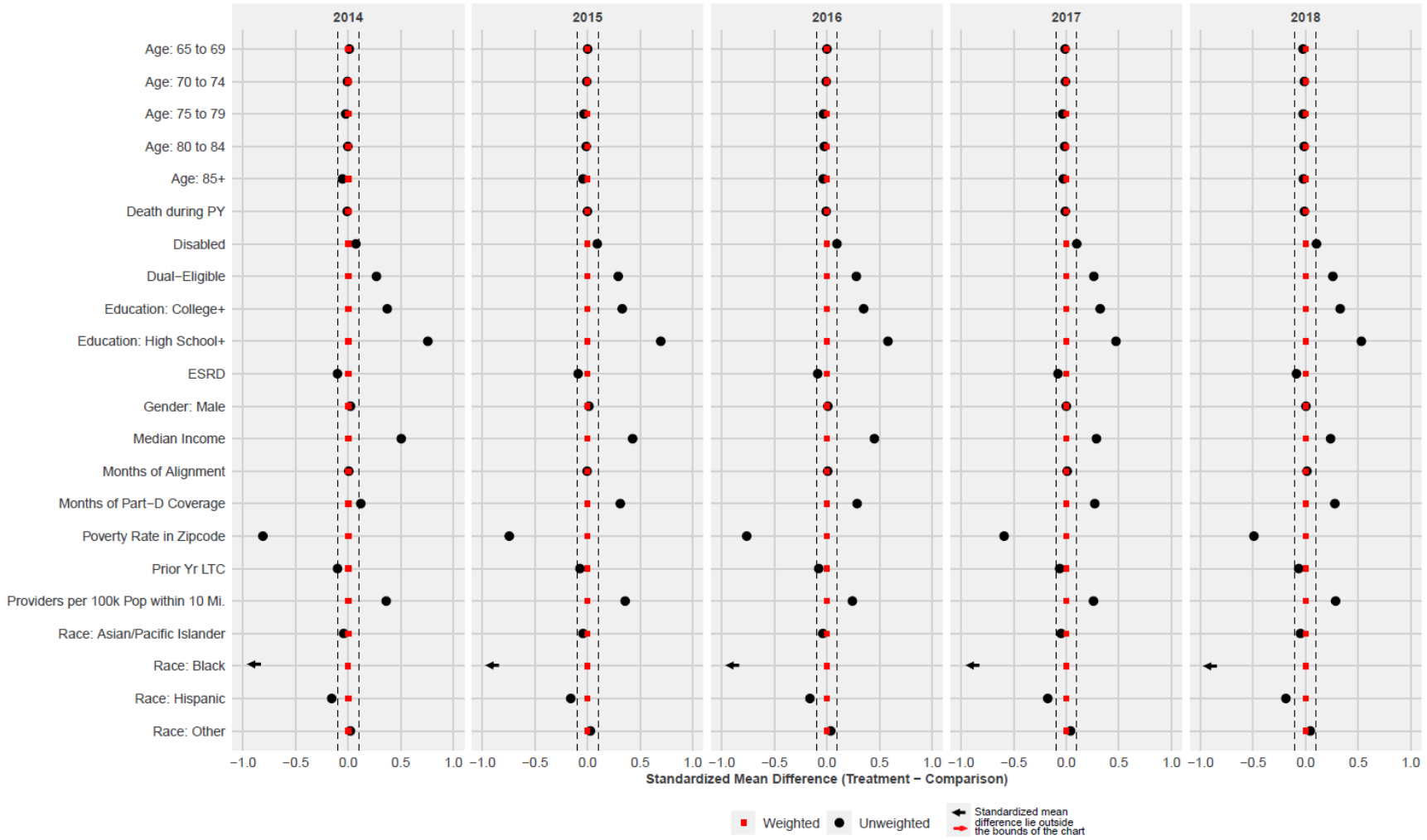
SOURCE: Analysis of Medicare claims data by NORC.

Appendix Exhibit E.2.7: ACO-Level Covariate Balance: Potentially Disabling Conditions, Method #1



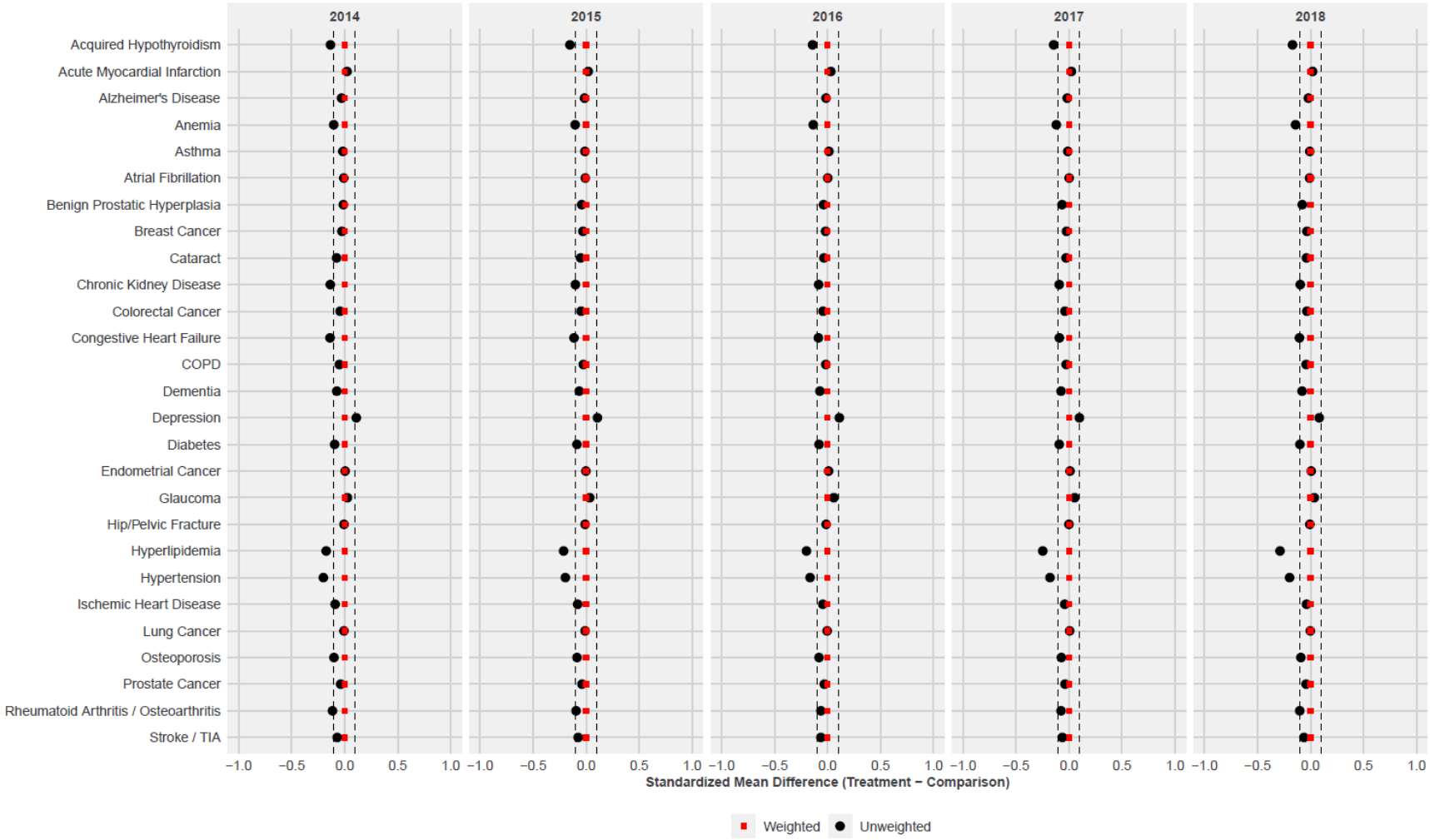
SOURCE: Analysis of Medicare claims data by NORC.

Appendix Exhibit E.2.8: State-Level Covariate Balance: Demographics & Medicare Eligibility, Method #1



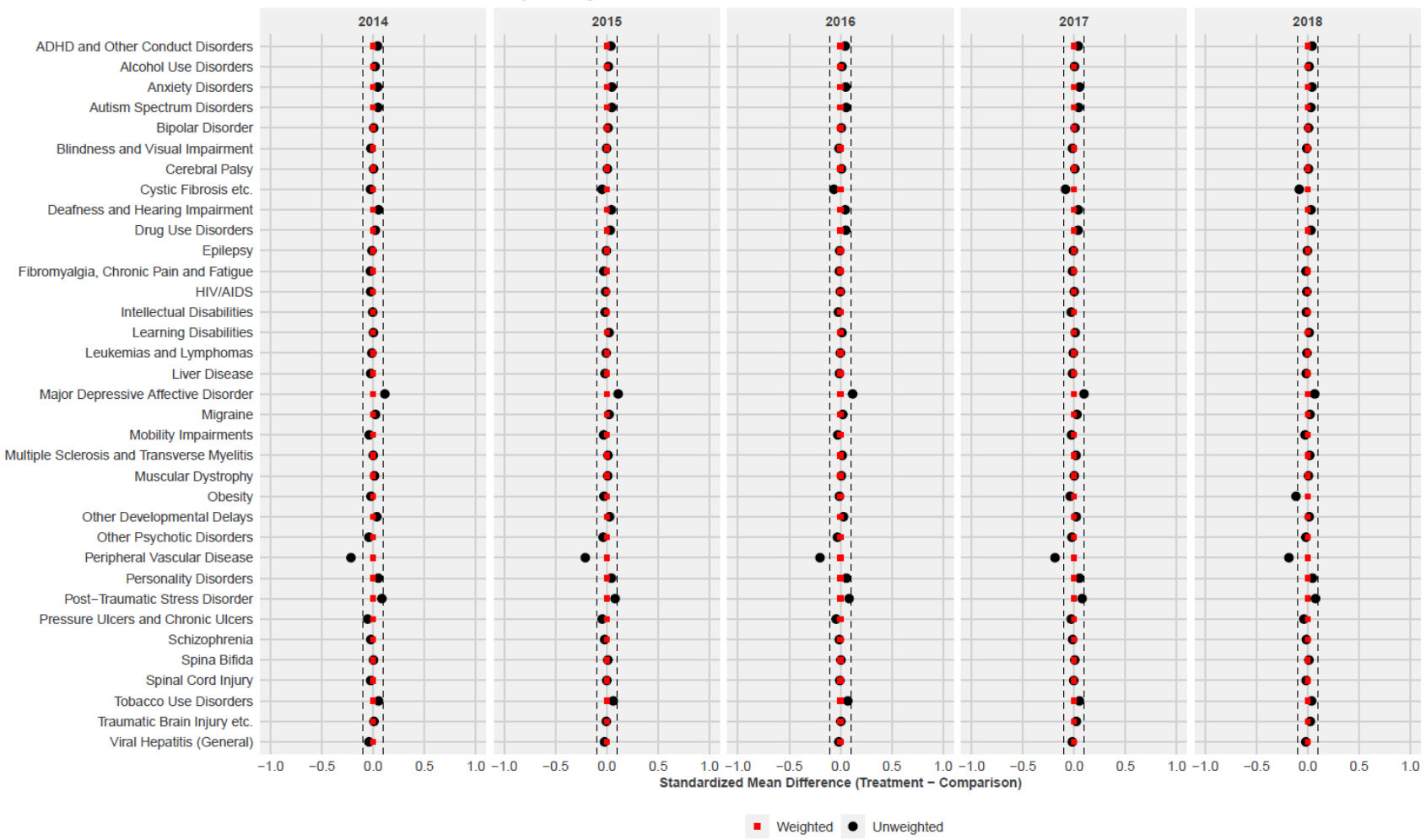
SOURCE: Analysis of Medicare claims data by NORC.

Appendix Exhibit E.2.9: State-Level Covariate Balance: Chronic Conditions, Method #1



SOURCE: Analysis of Medicare claims data by NORC.

Appendix Exhibit E.2.10: State-Level Covariate Balance: Potentially Disabling Conditions, Method #1



SOURCE: Analysis of Medicare claims data by NORC.

Appendix Exhibit E.2.11: Distribution of the Comparison Pool EB Weights, Method #1

	N	Minimum	Percentile					Maximum
			1%	10%	50%	90%	99%	
ACO-Level	618,030	<0.01	<0.01	0.02	0.21	0.62	1.8	20.2
State-Level	2,173,085	<0.01	<0.01	0.01	0.13	0.38	1	17.1

SOURCE: Analysis of Medicare claims data by NORC.

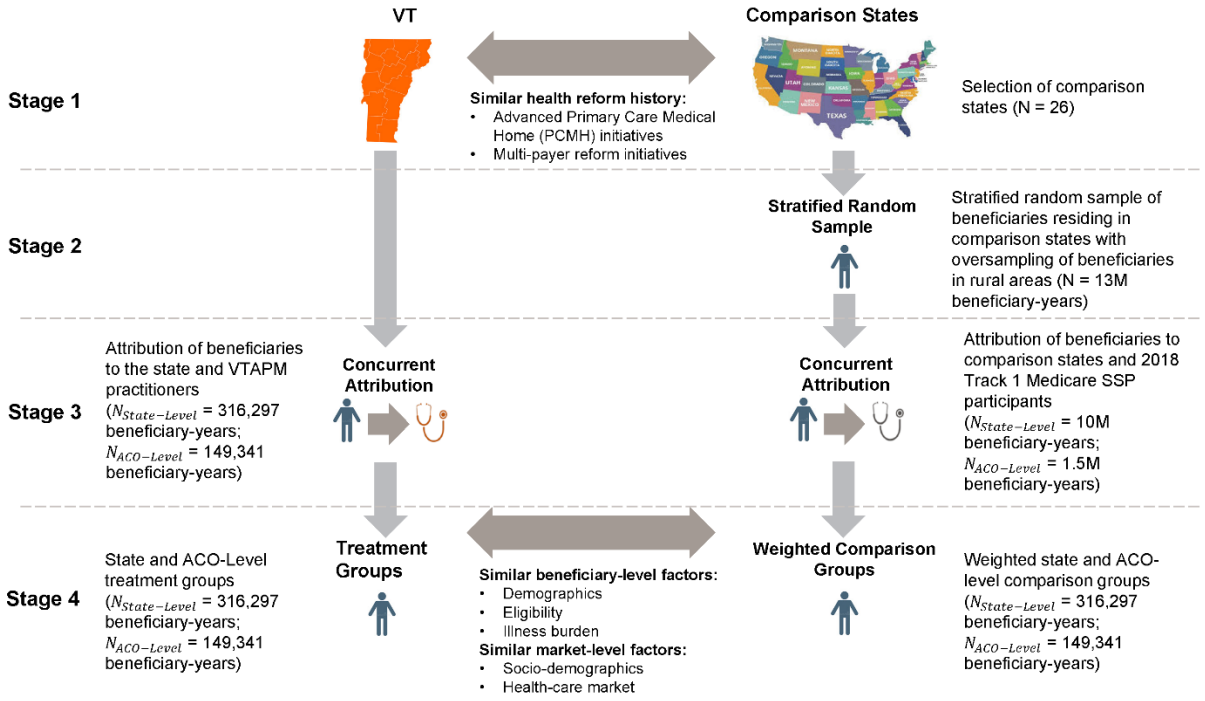
Implementation of the Method #1 comparison group design yielded a potentially limited comparison pool, which resulted in a comparison group with the following methodological limitations:

- Counties in comparison states were different from Vermont counties with respect to demographics, SES, and health insurance market characteristics. Vermont's counties were likely to be more educated, less poor, more employed, less uninsured, and to have lower MA penetration and greater ACO penetration relative to the available pool of comparison counties.
- We were unable to use a consistent approach to matching comparison counties to all 14 Vermont counties. As noted previously, the largest county in Vermont (Chittenden) was an outlier with respect to its propensity score, so we used a Euclidean distance approach to select its comparison counties, an analytic decision that could potentially be viewed as "overfitting to achieve a cherry-picked comparison group."

Appendix E.3: Design and Implementation of the Comparison Groups, Method #2

In collaboration with CMMI, we designed an alternative approach to constructing the comparison group with the aim of significantly increasing the size of the comparison pool and increasing the likelihood of constructing a comparison group that is similar to Vermont with respect to all market- and beneficiary-level factors. The revised approach, summarized in **Appendix Exhibit E.3.1**, includes all eligible beneficiaries in the comparison states in the comparison pool. Beneficiaries in Vermont and comparison pool were balanced on beneficiary-level and area-level variables in the beneficiary-level EB model. We defined baseline county-level variables pre-implementation for both Vermont and comparison counties because the VTAPM could potentially influence Vermont's county-level variables post-implementation.

Appendix Exhibit E.3.1: Comparison Group Design, Method #2



NOTE: Multi-payer initiatives include the following: State Innovation Models Initiative (SIM); Multi-Payer Advanced Primary Care Program (MAPCP).

The Method #2 comparison group design uses the same approach as Method #1 to select comparison states (Stage 1) and attribute comparison pool beneficiaries to the state- and ACO-level comparison groups (Stage 4). Next, we describe the alternative approaches used in Method #2 to select comparison pool beneficiaries (Stages 2 and 3) and construct the final weighted comparison group (Stage 5).

Stage 2—Selection of Eligible Beneficiaries Residing in the Comparison States. In contrast to Method #1, where we selected counties within the comparison states using PSM, we considered all eligible beneficiaries residing in each comparison state for inclusion in the comparison pool. To minimize computational burden involved in using a sizable comparison pool, we used a stratified random sample of beneficiaries in comparison states. Over 19 million eligible beneficiaries (95 million beneficiary-years) resided in the comparison states during the analytic period. Conducting impact analyses on a sample exceeding 10 million BPY is computationally challenging and would call for analytical resources exceeding those allocated for this evaluation. Therefore, we opted to draw a stratified random sample of beneficiaries from the comparison states to create the comparison pool. To ensure that the comparison pool included sufficient numbers of beneficiaries who were similar to Vermonters, we oversampled

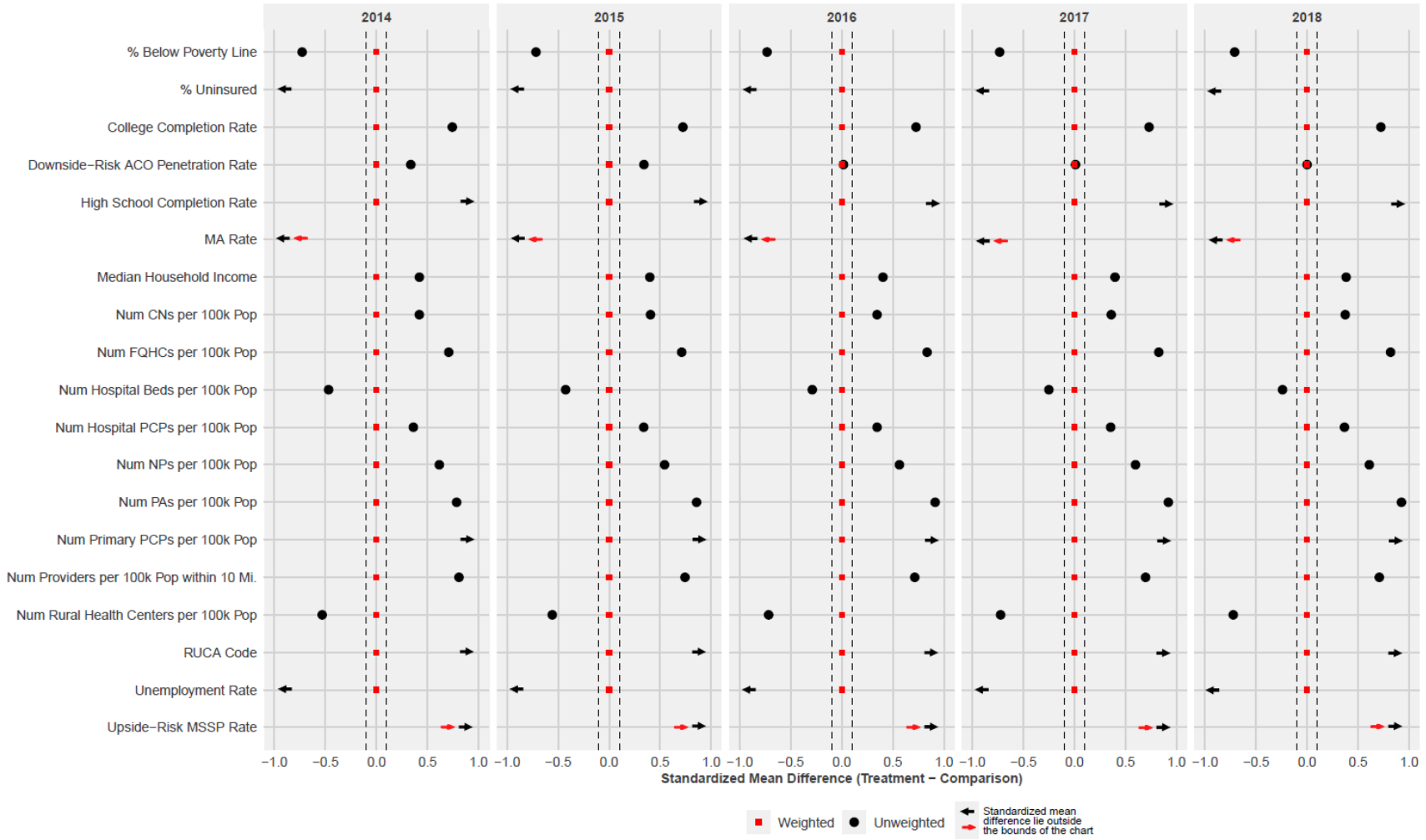
beneficiaries residing in RUCCs designated as small towns or rural areas.[27] As shown in Appendix Exhibit D.4.2, this approach yielded a comparison pool sample that was representative of comparison states with a computationally manageable sample size of 16.8 million beneficiary-years.

Stage 4—Construction of the Weighted Comparison Groups. For each baseline and performance period, we used EB to construct the final weighted comparison group, with the goal of ensuring that comparison group beneficiaries were on average similar to the treatment group in terms of all baseline beneficiary-level characteristics included in Method #1 and resided in areas with similar sociodemographic and health-care market characteristics as Vermont's. Our initial attempts to execute the models with all area- and beneficiary-level covariates failed due to non-convergence. We traced the issue to the inclusion of two baseline county-level covariates—MA and upside-risk Medicare SSP ACO penetration rates.[28] As documented in **Exhibit E.1.2**, Vermont counties have a significantly greater upside-risk Medicare SSP ACO penetration rate and lower MA penetration rate than most counties in the comparison pool. With the exception of these two market-level covariates, we were able to balance Vermont and the comparison groups on county- and beneficiary-level characteristics in the revised comparison group approach (see **Appendix Exhibits E.3.2-E.3.10**). We observed extreme outliers in the distribution of EB weights for the Method #2 state and ACO-level comparison pools, as shown in **Appendix Exhibit E.3.11**.

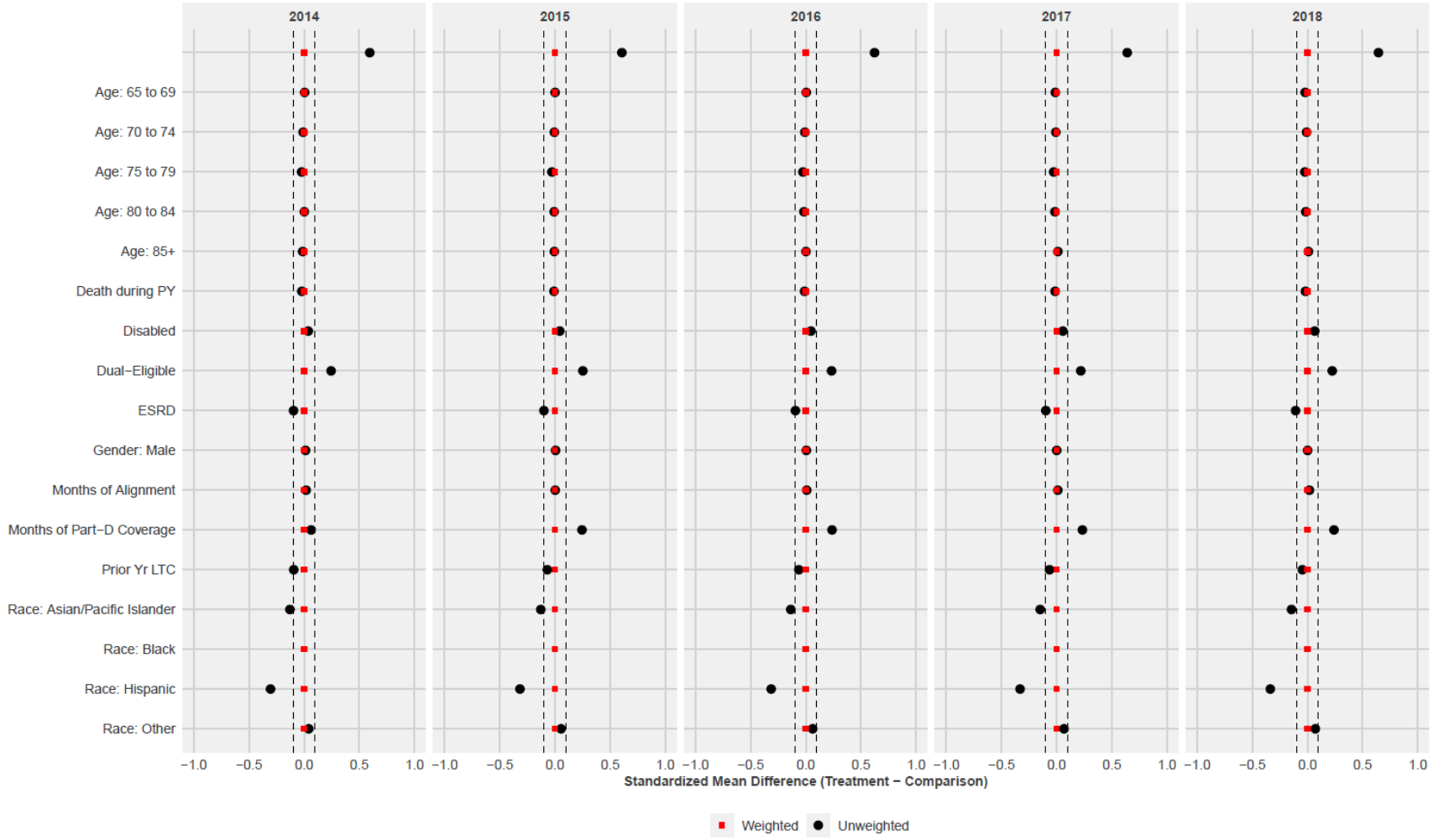
[27] The comparison pool sample includes all beneficiaries residing in rural comparison counties, about 55 percent of all beneficiaries in nonmetropolitan comparison counties, and 6 percent of all beneficiaries in metropolitan comparison counties.

[28] Almost all EB model specifications that included these factors failed to converge.

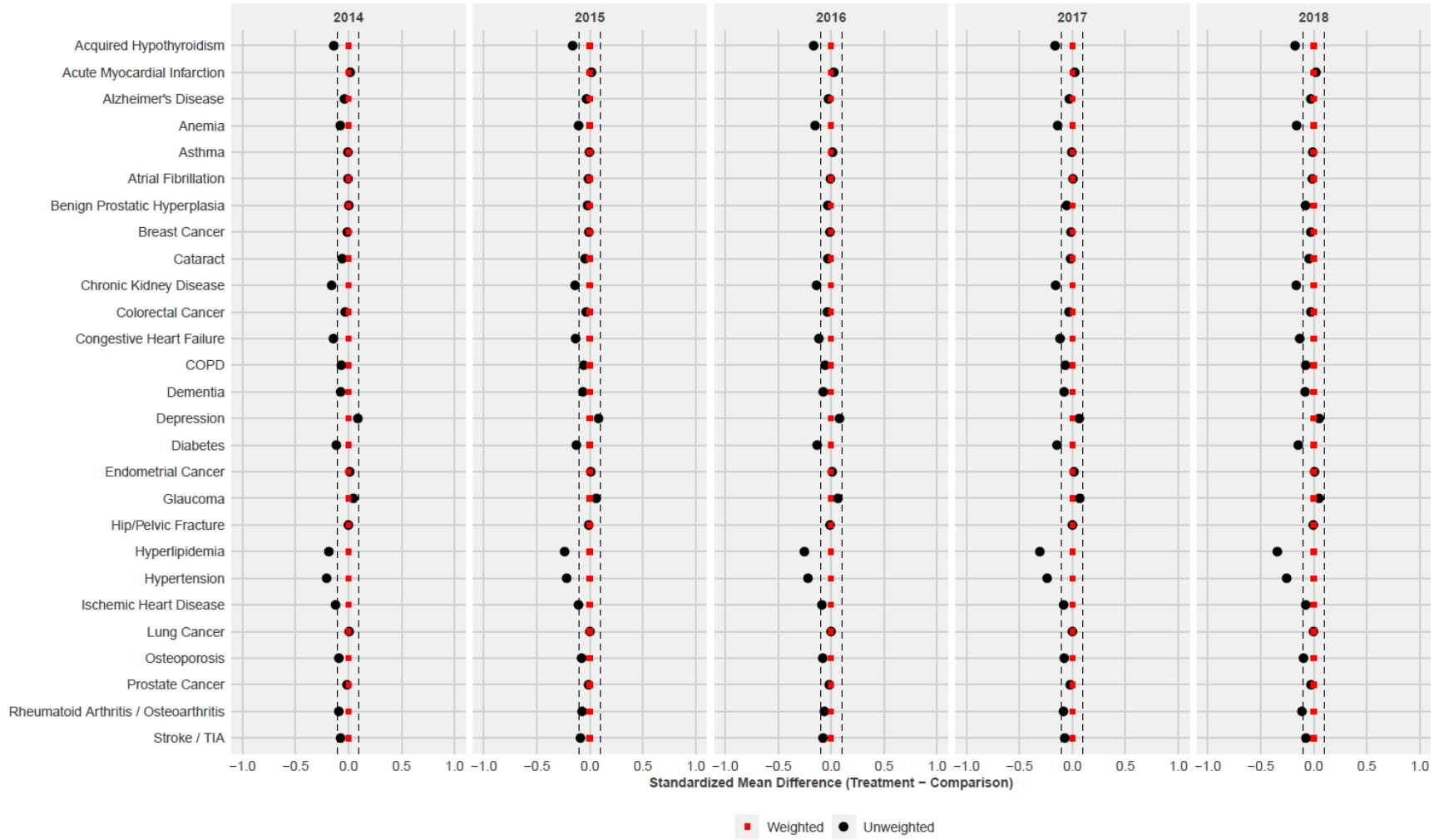
Appendix Exhibit E.3.2: ACO-Level Covariate Balance: County- and ZCTA-Level Characteristics, Method #2



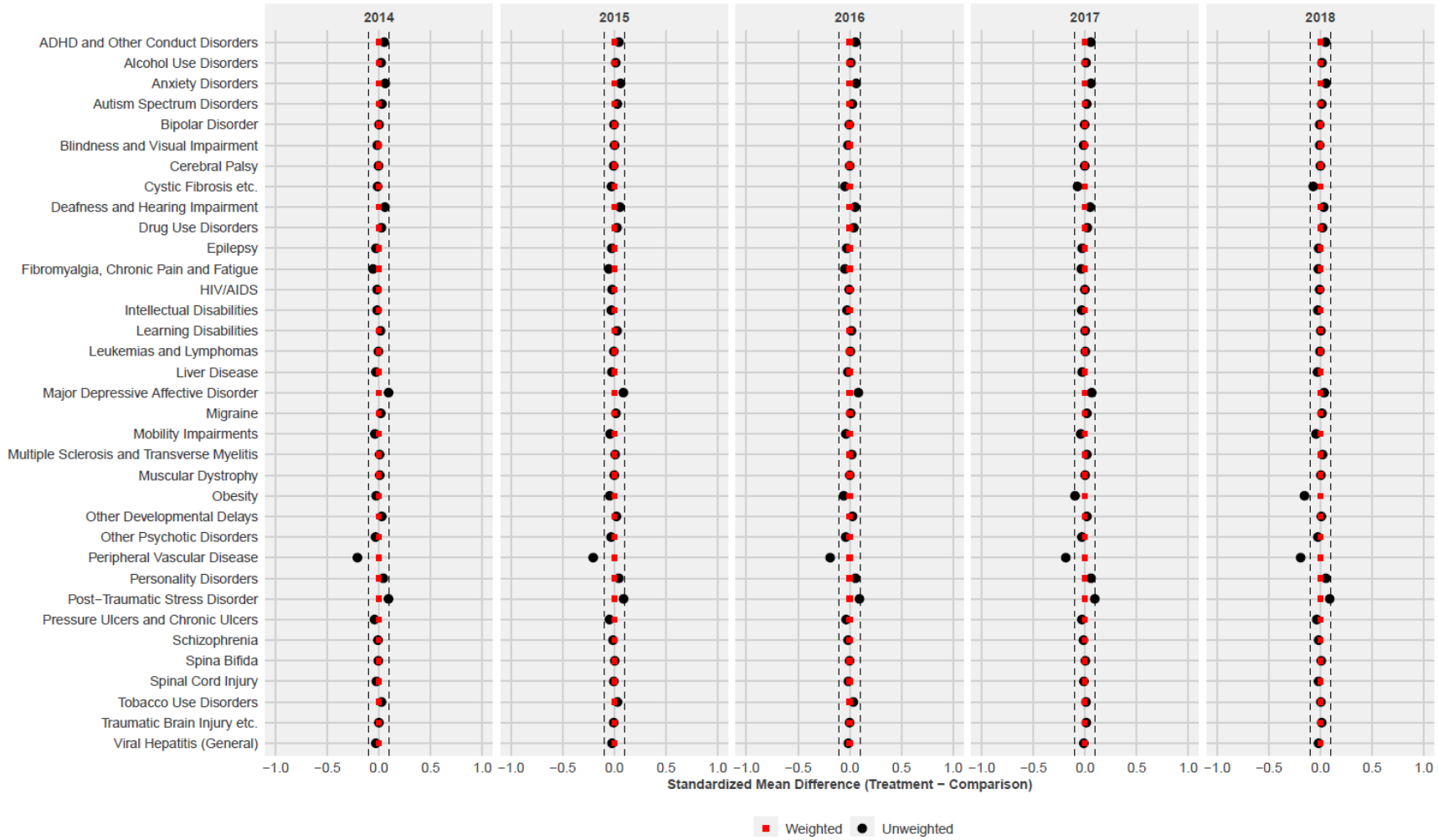
Appendix Exhibit E.3.3: ACO-Level Covariate Balance: Demographics and Medicare Eligibility, Method #2



Appendix Exhibit E.3.4: ACO-Level Covariate Balance: Chronic Conditions, Method #2

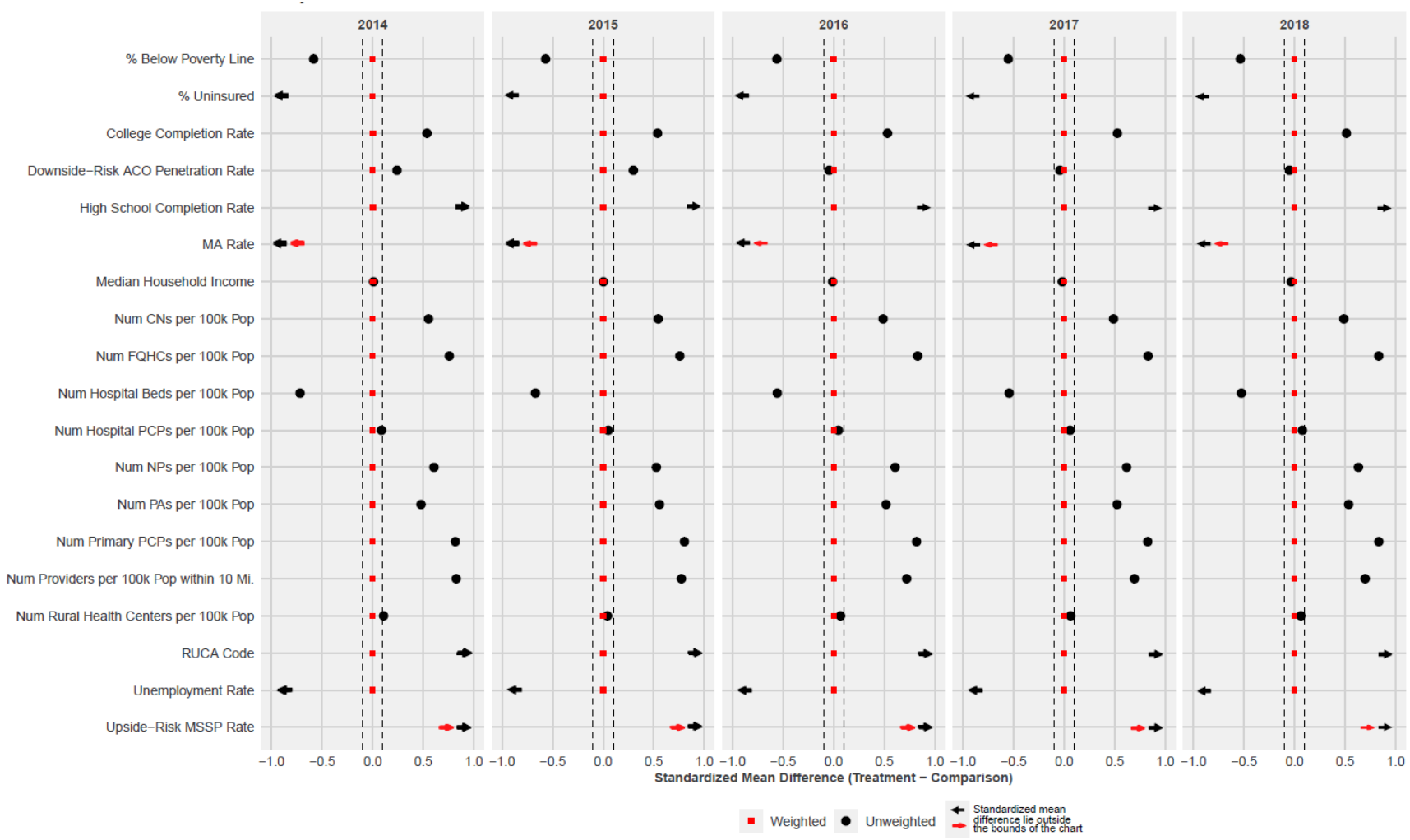


Appendix Exhibit E.3.5: ACO-Level Covariate Balance: Potentially Disabling Conditions, Method #2

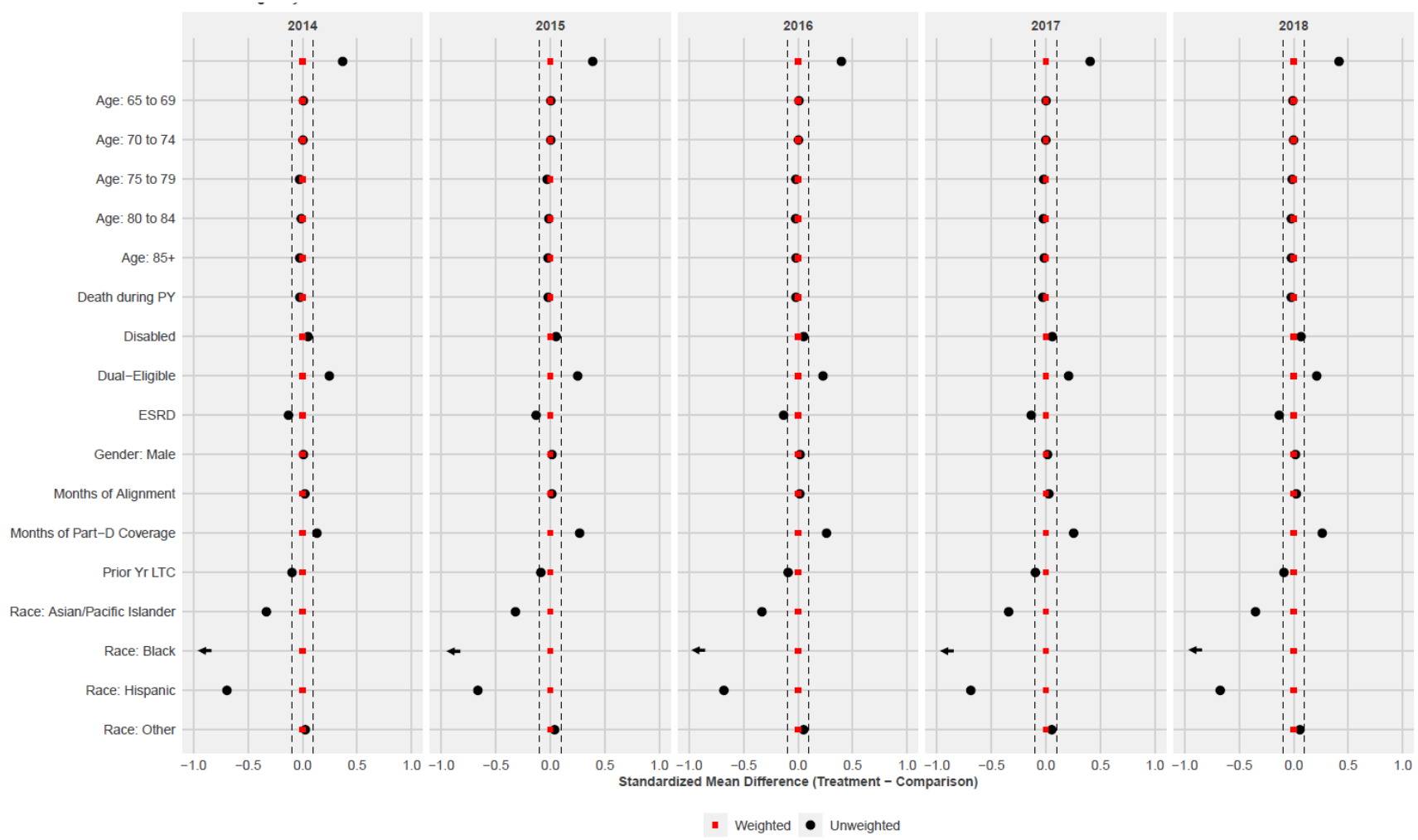


SOURCE: Analysis of Medicare claims data by NORC.

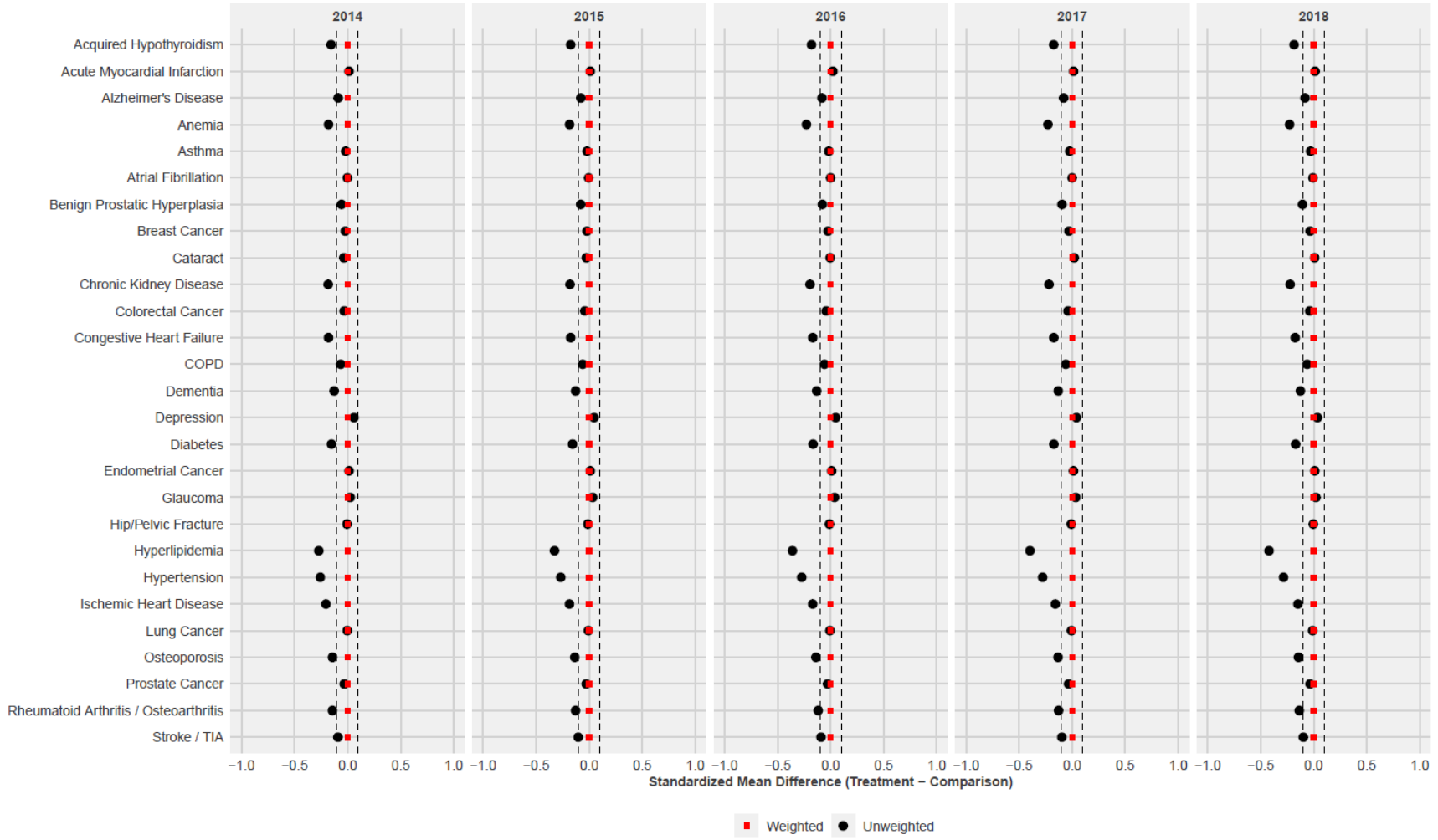
Appendix Exhibit E.3.6: State-Level Covariate Balance: County- and ZCTA-Level Characteristics, Method #2



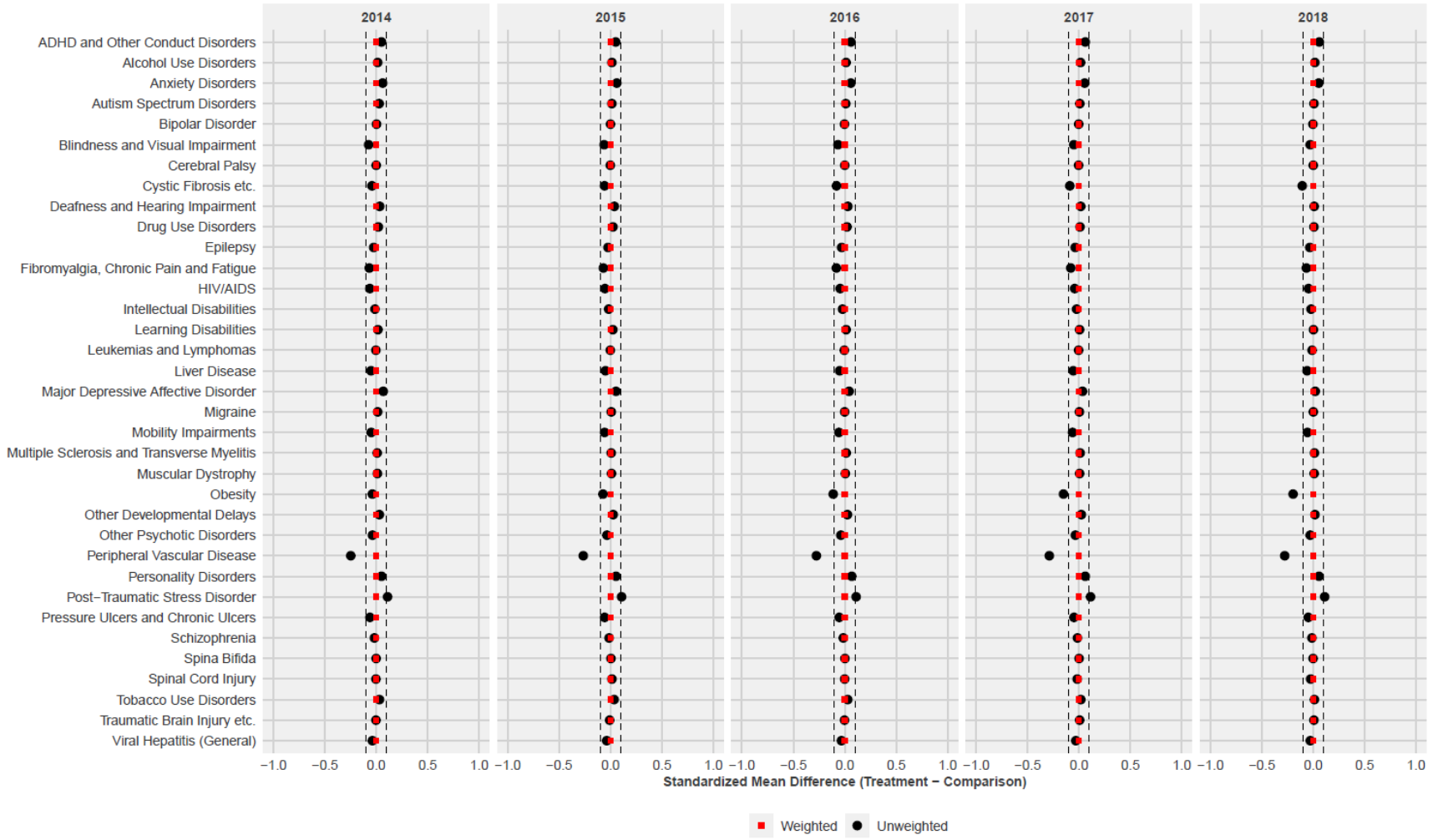
Appendix Exhibit E.3.7: State-Level Covariate Balance: Demographics and Medicare Eligibility, Method #2



Appendix Exhibit E.3.8: State-Level Covariate Balance: Chronic Conditions, Method #2



Appendix Exhibit E.3.9: State-Level Covariate Balance: Potentially Disabling Conditions, Method #2



SOURCE: Analysis of Medicare claims data by NORC.

Appendix Exhibit E.3.10: Distribution of the Comparison Pool EB Weights, Method #2

	N	Minimum	Percentile					Maximum
			1%	10%	50%	90%	99%	
ACO-Level	1,937,919	<0.01	<0.01	<0.01	<0.01	0.03	1.2	695.6
State-Level	12,475,496	<0.01	<0.01	<0.01	<0.01	0.03	0.5	394.6

SOURCE: Analysis of Medicare claims data by NORC.

The Method #2 comparison group population significantly overlaps with that of the Method #1 comparison group; over a quarter of Method #2 comparison group beneficiaries reside in Method #1 counties, which accounts for only 3 percent of all counties in the Method #2 comparison group, as shown in **Appendix Exhibit E.3.11**.

Appendix Exhibit E.3.11: Overlap in Comparison Groups between Methods #1 and #2

		2014	2015	2016	2017	2018
ACO-Level	Counties (Count)	39	41	41	41	42
	Counties (Percent)	3%	3%	3%	3%	3%
	Comparison Group Beneficiaries (Count)	15,589	16,824	20,236	21,718	22,687
	Comparison Group Beneficiaries (Percent)	5%	5%	5%	5%	5%
	Comparison Group Beneficiaries (Weighted Count)	8,192	8,943	9,285	9,722	10,041
	Comparison Group Beneficiaries (Weighted Percent)	24%	25%	25%	25%	25%
State-Level	Counties (Count)	42	42	42	42	42
	Counties (Percent)	2%	2%	2%	2%	2%
	Comparison Group Beneficiaries (Count)	60,305	60,877	64,737	67,286	68,246
	Comparison Group Beneficiaries (Percent)	2%	3%	3%	3%	3%
	Comparison Group Beneficiaries (Weighted Count)	10,893	10,743	10,941	11,391	11,989
	Comparison Group Beneficiaries (Weighted Percent)	14%	14%	14%	14%	15%

SOURCE: Analysis of Medicare claims data by NORC.

The distribution of the weighted comparison group across the comparison states is presented in **Appendix Exhibit E.3.12**.

Appendix Exhibit E.3.12: Distribution of the Weighted Comparison Group by Comparison State, Method #2

ACO-Level			State-Level		
State	Beneficiary-Years (Weighted Count)	Beneficiary-Years (Weighted Percent)	State	Beneficiary-Years (Weighted Count)	Beneficiary-Years (Weighted Percent)
WA	32,602	18%	ME	44,696	11%
CO	32,484	17%	MI	39,687	10%
NC	27,413	15%	CO	33,584	8%
MN	15,427	8%	WA	30,483	8%
CA	14,587	8%	MN	28,635	7%
IA	13,852	7%	CA	25,326	6%
TN	10,753	6%	IA	24,293	6%
OH	9,613	5%	OR	21,973	6%
MO	6,519	4%	NC	18,795	5%
OR	4,501	2%	TX	13,640	3%
ID	4,316	2%	PA	11,961	3%
SC	3,318	2%	OH	11,828	3%
NM	3,018	2%	MO	11,181	3%
AR	2,621	1%	ID	10,577	3%
GA	1,908	1%	NM	10,534	3%
RI	781	<1%	GA	10,499	3%
MI	555	<1%	CT	9,284	2%
ME	473	<1%	TN	9,096	2%
WY	358	<1%	WY	8,976	2%
LA	348	<1%	FL	7,473	2%
TX	243	<1%	AR	5,408	1%
FL	142	<1%	SC	3,354	1%
CT	75	<1%	RI	2,773	1%
PA	31	<1%	LA	1,079	<1%
HI	19	<1%	DE	1,008	<1%
DE	3	<1%	HI	937	<1%

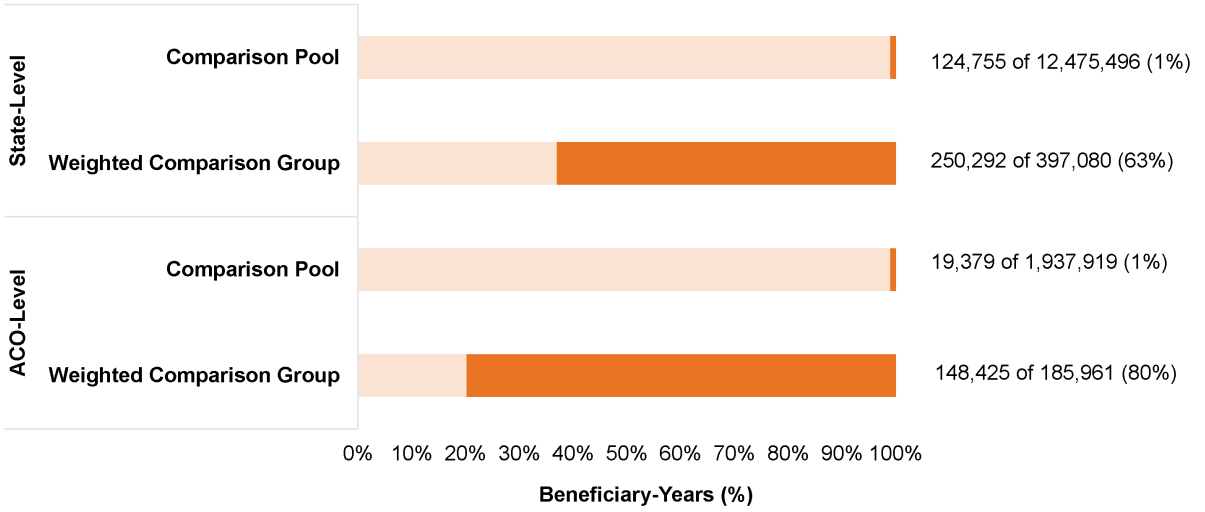
SOURCE: Analysis of Medicare claims data by NORC.

In the section below, we describe the methods we used to achieve balance on all area-level sociodemographic and health-care market characteristics, and reduce constraints on the EB model to decrease the proportion of outlier EB weights and increase the effective sample size of the weighted comparison group.

We encountered the following methodological challenges when implementing the Method #2 comparison group design:

- To minimize computational burden involved in using a sizable comparison pool, we used a stratified, random sample of beneficiaries residing in the comparison states.
- It is highly likely that a set of positive weights that satisfy the balance constraints for the MA and upside-risk Medicare SSP participation rate does not exist due to the limited overlap between the pool of comparison counties and Vermont counties. Because providers in Vermont were more likely to have experience with upside-risk Medicare ACO contracts (three Medicare SSP, one Medicaid ACO, and a commercial ACO operated in the state during the baseline period), it is possible that certain differences in outcomes between the two groups could be attributed to varying levels of experience with these contracts in addition to impacts attributed to the VTAPM. Providers' differing levels of experience with these contracts between the ACO-level impact analysis treatment and comparison groups are mitigated to some extent, because the comparison group is limited to beneficiaries who are attributed to Track 1 Medicare SSP ACO providers.
- Although we were able to achieve balance on most baseline market-level and all beneficiary-level covariates, it came with a tradeoff: a small proportion of beneficiaries with large EB weights make up a large proportion of the weighted comparison group. For example, as shown in **Exhibit E.3.13**, 1 percent (n = 19,379) of the ACO-level comparison pool beneficiaries account for 80 percent of the ACO-level weighted comparison group. These patterns indicate that a very small proportion of beneficiaries in the comparison pool reside in areas with market-level characteristics similar to Vermont's. Therefore, we conclude that the issue of the limited comparison pool is unrelated to the choice of comparison group method. Instead, we find evidence that few regions outside Vermont have exactly similar market-level demand and supply characteristics.

Appendix Exhibit E.3.13: Outlier EB Weights, Method #2



Appendix E.4: Final Comparison Group Design, Revised Method #2

We finalized our comparison group design by revising Method #2 with a more parsimonious EB model to reduce the proportion of outlier weights. In this parsimonious EB model specification, we prioritized the area-level factors expected to most influence claims-based outcome measures (see **Appendix Exhibit E.4.1**).

Appendix Exhibit E.4.1: Market-Level Factors in EB Specification, Revised Model #2

Domain	Factors	Geographic Unit	Included in Method #2 EB Specification	Included in Revised Method #2 EB Specification
Socio-demographic Factors	Population Density–RUCC	County	●	●
	High School Completion Rate	ZCTA	●	●
	College Completion Rate	ZCTA	●	
	Poverty Rate	ZCTA	●	
	Median Household Income	ZCTA	●	●
	Unemployment Rate	ZCTA	●	
	Uninsured Rate	ZCTA	●	
Health Insurance Market	MA Penetration Rate	County		
	Upside Risk MSSP Penetration Rate	County		
	Downside Risk MSSP Penetration Rate	County	●	

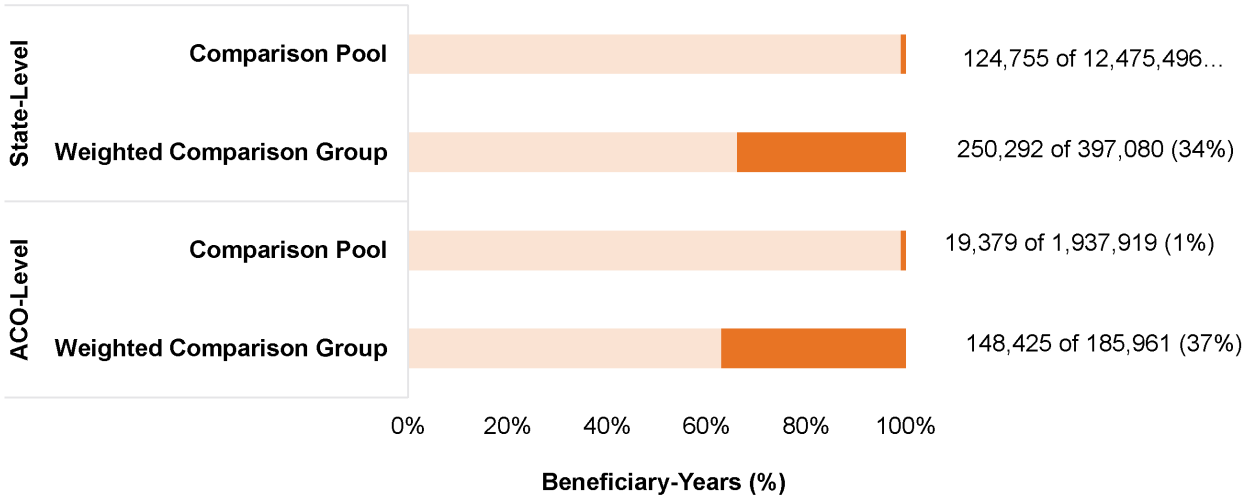
Domain	Factors	Geographic Unit	Included in Method #2 EB Specification	Included in Revised Method #2 EB Specification
Health Services Availability	Active Physicians per 100k Pop.	County	●	●
	Primary Care Physicians per 100k Pop.	County	●	●
	Non-Physician Primary Care Practitioners 100k Pop.	County	●	●
	Health Centers per 100k Pop.	County	●	●
	Hospital Beds per 100k Pop.	County	●	●

SOURCE: Analysis of Medicare claims data by NORC.

At the county level, we retained all health services availability factors but combined individual covariates into meaningful categories to reduce the number of constraints on the EB model. We combined all health centers (FQHCs and RHCs) into one category—health centers per 100,000 population. We combined the hospital and community-based primary care physicians into a single category. Finally, we combined all non-physician primary care practitioners (e.g., nurse practitioners, physician assistants, certified nurses) into a single category. We retained county-level RUCC classification to account for the market's population density. At the ZCTA level, we retained median household income and high school completion rate in the parsimonious EB specification because we deemed these covariates the most important proxies for socioeconomic status. Because these ZCTA-level factors were primarily responsible for producing the large proportion of outlier EB weights, we coarsened the socioeconomic status covariates by converting them into quintiles based on the overall distribution of the values across the comparison pool.

As shown in **Appendix Exhibit E.4.2**, the parsimonious EB model specification reduced the proportion of beneficiaries in the comparison pool with outlier EB weights.

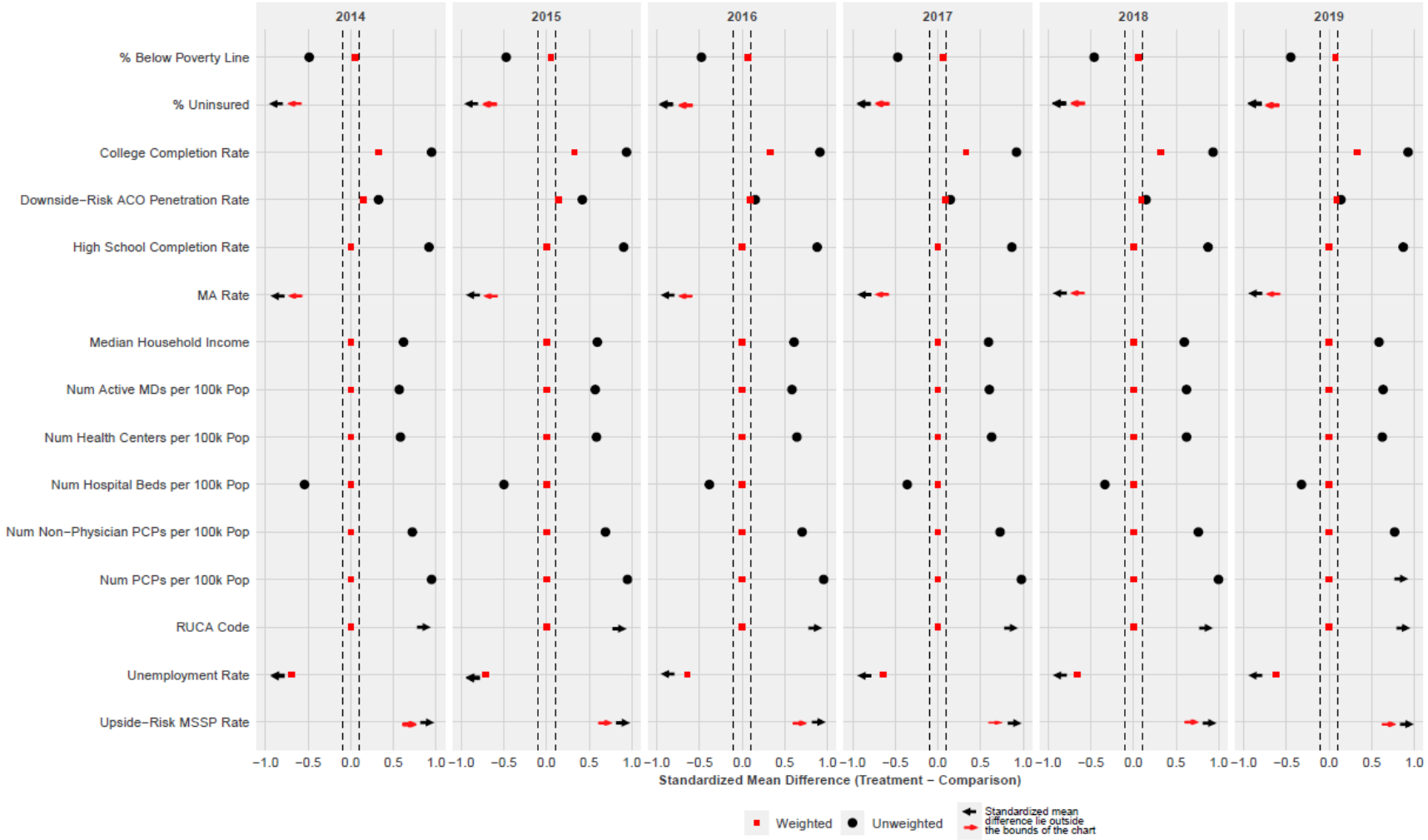
Appendix Exhibit E.4.2: Outlier EB Weights, Revised Method #2



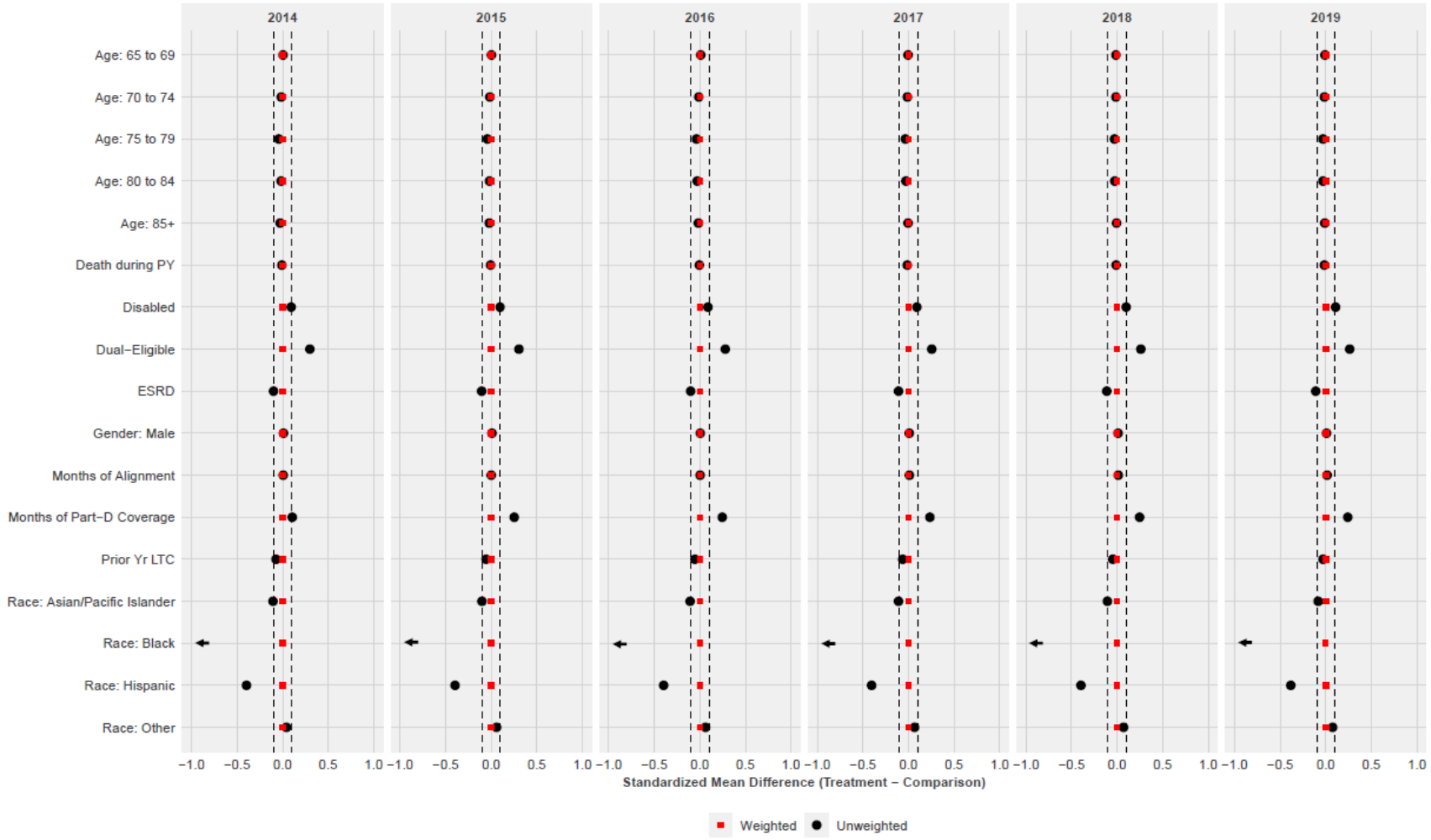
SOURCE: Analysis of Medicare claims data by NORC.

As expected, the exclusion of some market-level characteristics from the EB model resulted in a loss of covariate balance on the following market-level factors relative to the original EB model specification in Method #2: downside risk Medicare SSP rate, unemployment rate, college completion rate, and uninsured rate, as shown in **Appendix Exhibits E.4.3-E.4.10**. While there were outliers in the distribution of EB weights for the Revised Method #2 state and ACO-level comparison pools, they were much less extreme than outliers from Method #2, as shown in **Appendix Exhibit E.4.11**.

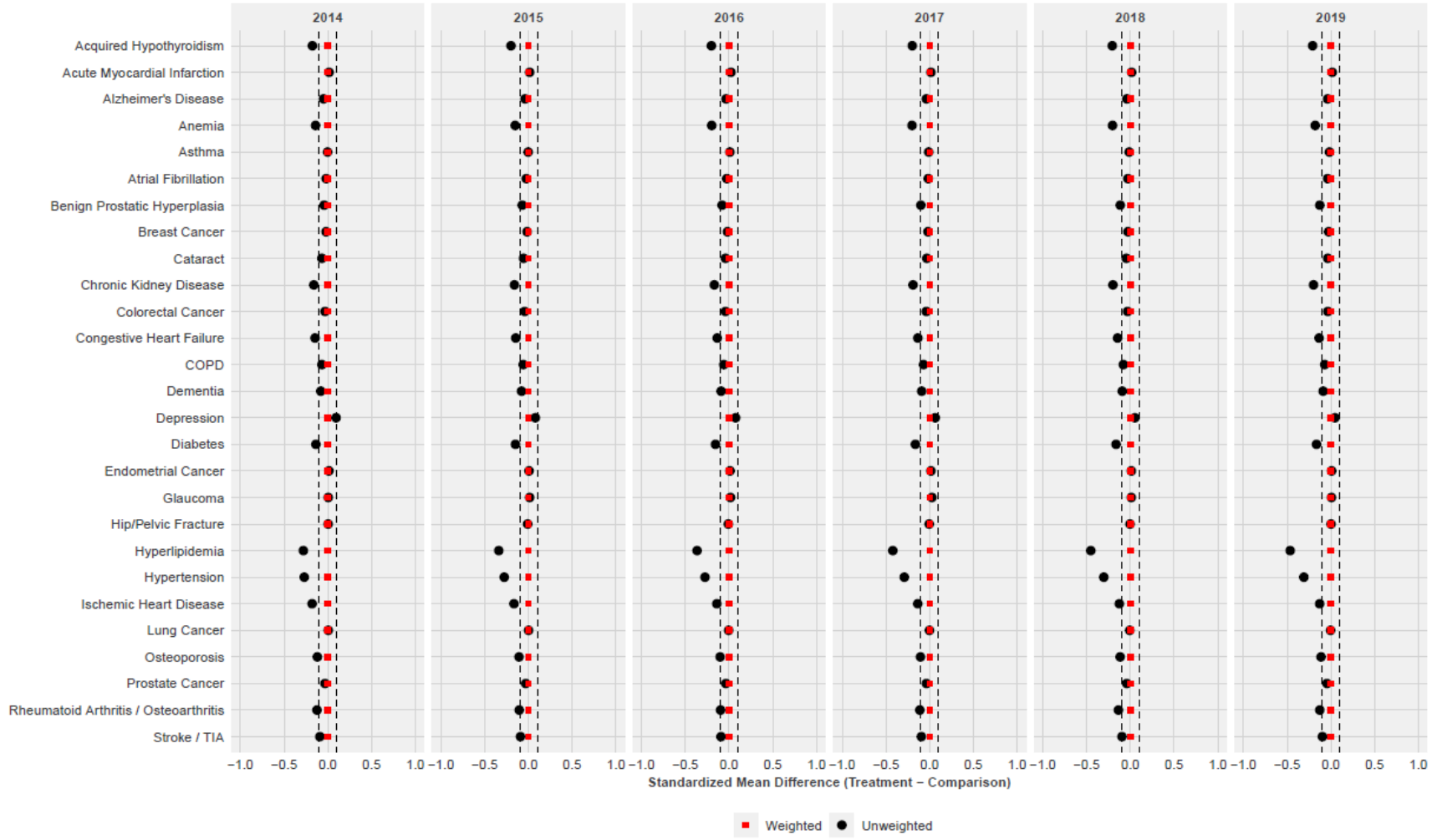
Appendix Exhibit E.4.3: ACO-Level Covariate Balance: County- and ZCTA-Level Characteristics, Revised Method #2



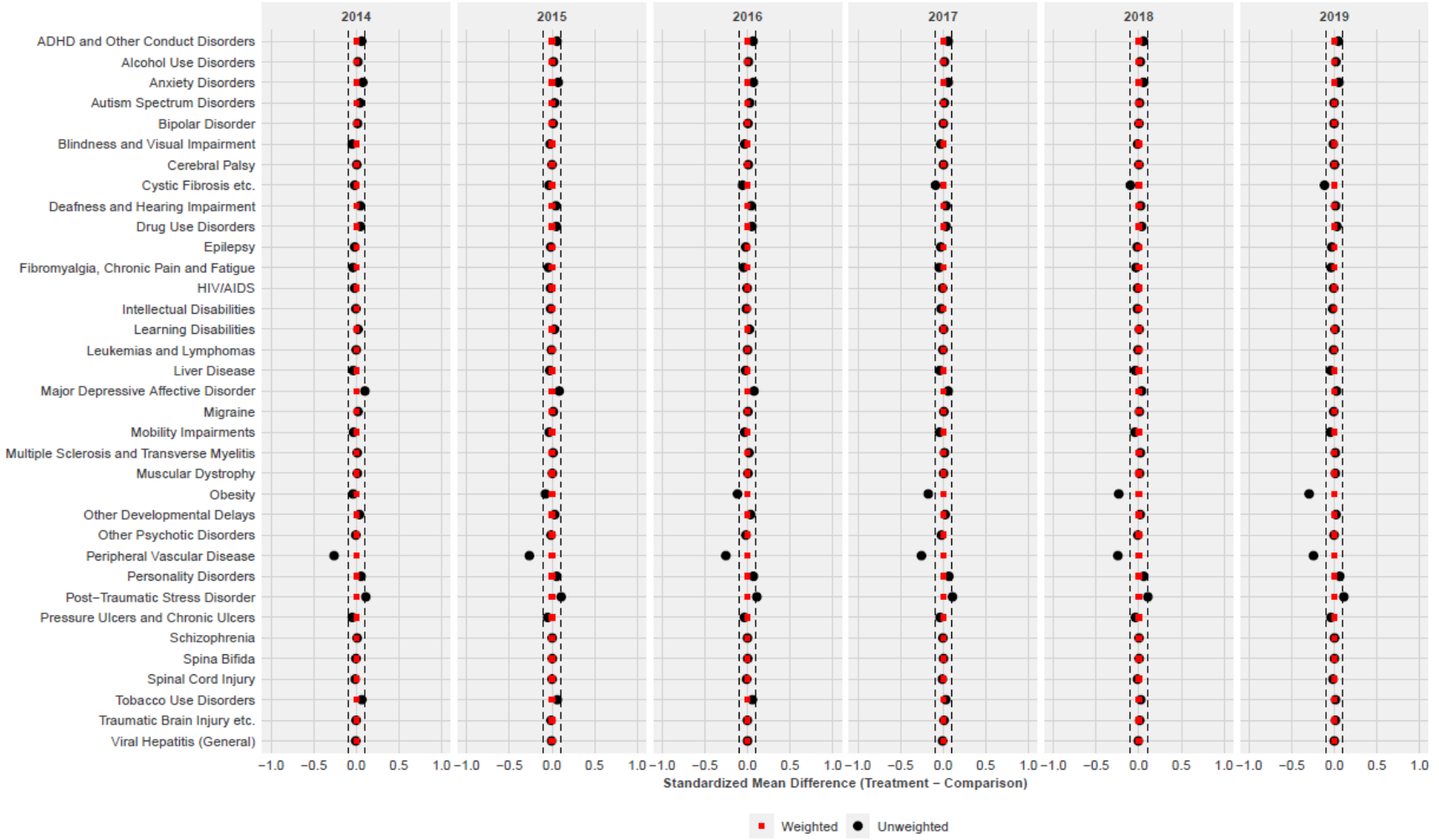
Appendix Exhibit E.4.4: ACO-Level Covariate Balance: Demographics and Medicare Eligibility, Revised Method #2



Appendix Exhibit E.4.5: ACO-Level Covariate Balance: Chronic Conditions, Revised Method #2

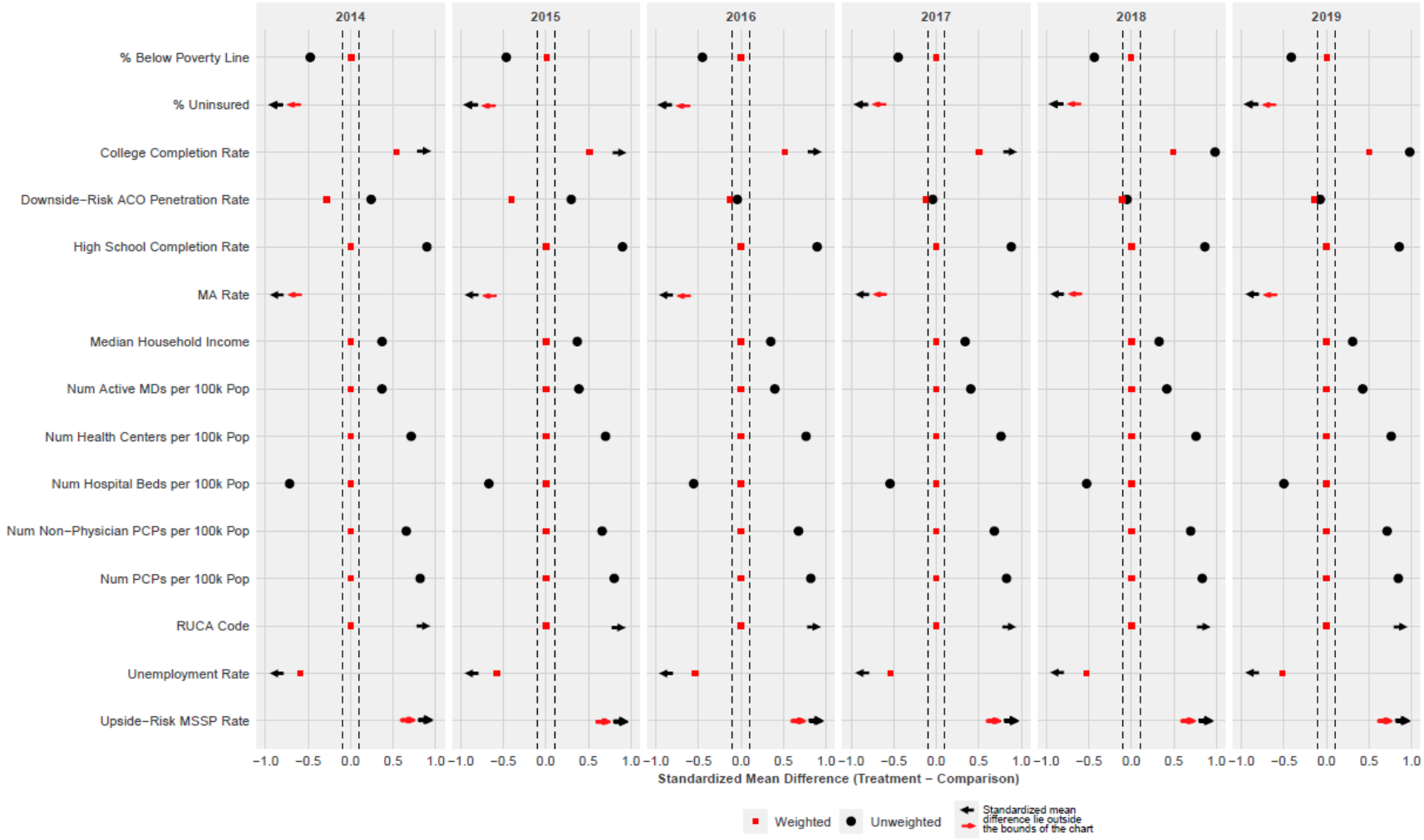


Appendix Exhibit E.4.6: ACO-Level Covariate Balance: Potentially Disabling Conditions, Revised Method #2

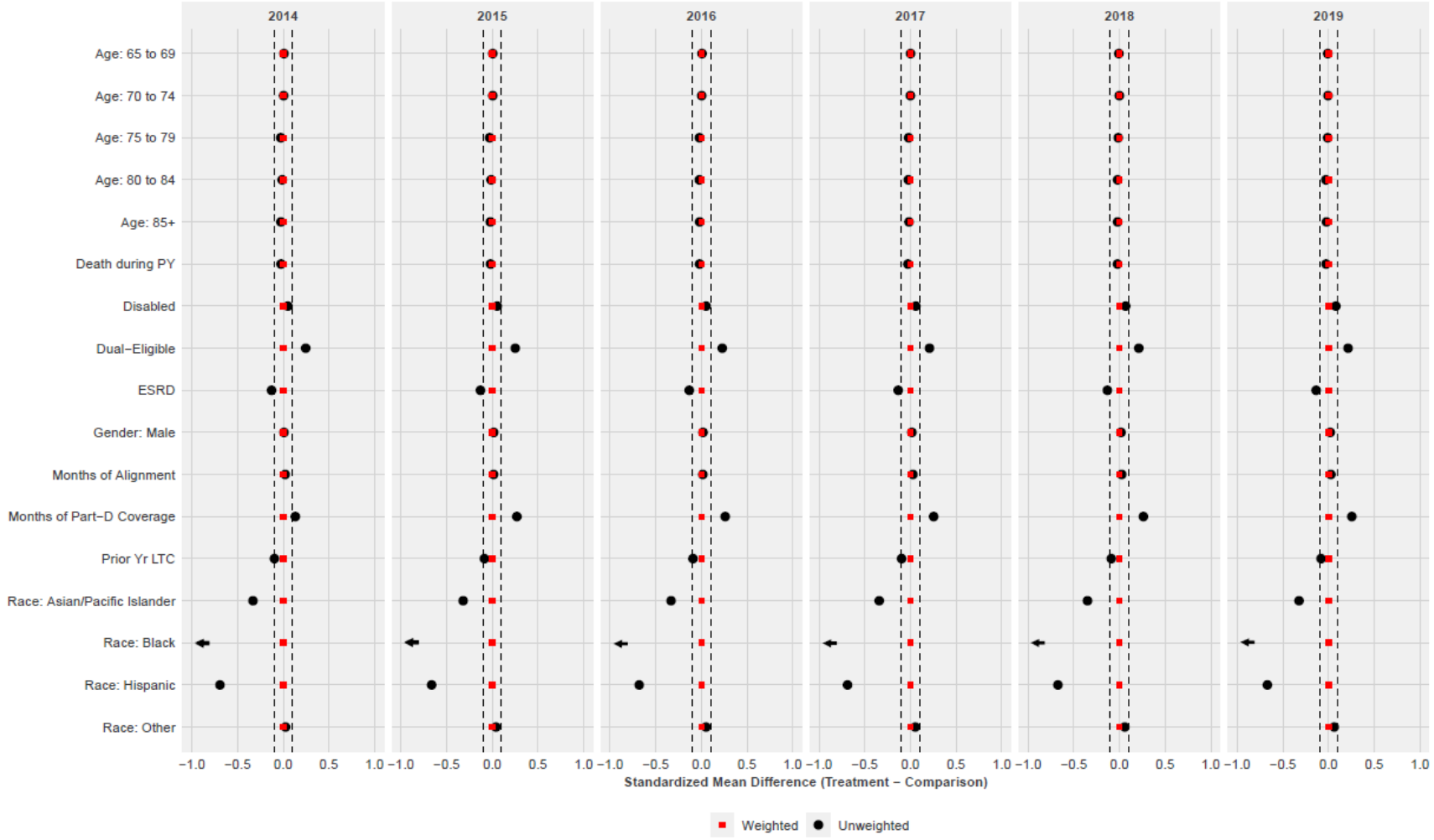


SOURCE: Analysis of Medicare claims data by NORC.

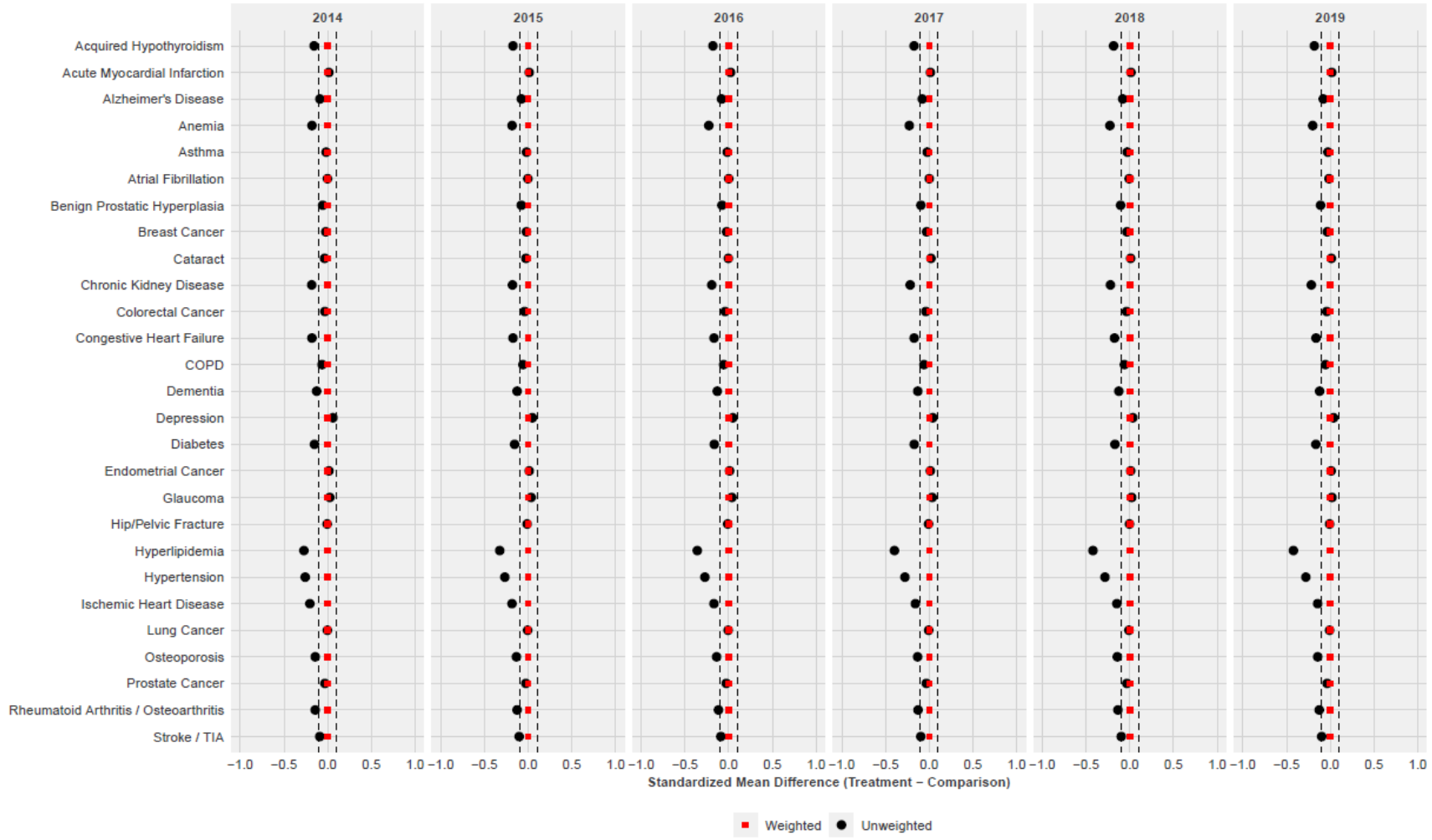
Appendix Exhibit E.4.7: State-Level Covariate Balance: County- and ZCTA-Level Characteristics, Revised Method #2



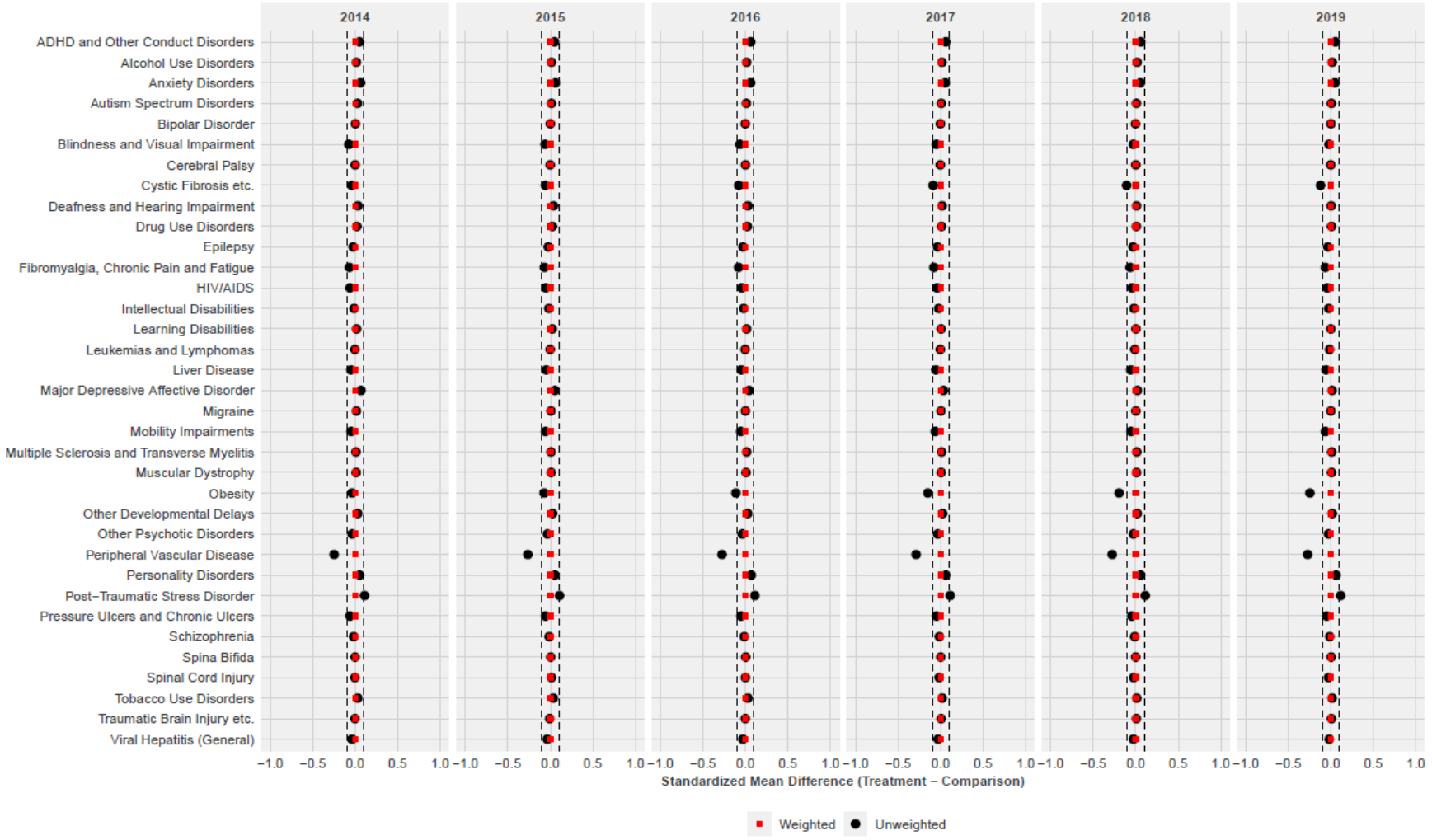
Appendix Exhibit E.4.8: State-Level Covariate Balance: Demographics and Medicare Eligibility, Revised Method #2



Appendix Exhibit E.4.9: State-Level Covariate Balance: Chronic Conditions, Revised Method #2



Appendix Exhibit E.4.10: State-Level Covariate Balance: Potentially Disabling Conditions, Revised Method #2



SOURCE: Analysis of Medicare claims data by NORC.

Appendix Exhibit E.4.11: Distribution of Comparison Pool EB Weights, Revised Method #2

	N	Minimum	Percentile					Maximum
			1%	10%	50%	90%	99%	
ACO-Level	1,938,040	<0.01	<0.01	<0.01	0.01	0.17	1.4	93
State-Level	12,476,056	<0.01	<0.01	<0.01	<0.01	0.06	0.4	25.9

SOURCE: Analysis of Medicare claims data by NORC.

Appendix E.5: Relative Merits of the Comparison Group Designs

We chose to employ Method #2 to construct the comparison groups for the following reasons:

- Method #2 involved a consistent approach to constructing the comparison group, unlike Method#1 where we used differing approaches to identify matched comparison counties.
- Method #2 yielded better balance than did the original approach across most market-level variables. However, this approach assigned disproportionately greater weights to a small proportion of comparison beneficiaries.
- Over a quarter of the Method #2 comparison group beneficiaries reside in Method #1 counties, which accounts for only 3 percent of all counties in the Method #2 comparison group (see **Appendix Exhibit E.3.5**). Therefore, there is significant overlap between both comparison group populations.

Appendix E.6: Impact Estimates for Alternative Comparison Group Specifications

Appendix Exhibits E.6.1 and E.6.2 present the ACO- and state-level findings, respectively, for the three alternative comparison groups.

Appendix Exhibit E.6.1: Comparison of ACO-Level Findings, Alternative Comparison Group Specifications (PY1)

	Method #1			Method #2			Revised Method #2			Difference in Impact Estimates		
	Estimate	% Impact	p	Estimate	% Impact	p	Estimate	% Impact	p	Sign	Sig.	Both
Spending ($ PBPY)												
Total Medicare spending (Parts A and B)	7.49	0.08	0.98	-121.71	-1.15	0.93	-352.06	-3.39	0.547			
Utilization (per 1,000 BPY)												
Acute care stays	-12.17 †	-5.73	0.13	68.64	22.28	0.12	-20.91 †	-8.04	0.158			
Acute care days	-6.49	-0.73	0.91	439.67**	33.51	0.05	-35.13	-3.13	0.694			
ED visits and observation stays	44.18**	8.77	0.04	16.60	2.07	0.86	23.91	4.401	0.650		X	
E&M visits	-112.03	-0.77	0.75	900.65	7.28	0.47	-130.13	-0.90	0.627			
Primary E&M visits	390.78 †	6.21	0.11	1574.56** †	36.08	0.01	41.39 †	0.62	0.785			
Specialty E&M visits	-983.61*** †	-11.06	<0.01	-963.79	-11.70	0.53	-857.16* †	-10.1	0.081			
SNF stays	-1.41	-3.56	0.66	26.85***	49.48	<0.01	-0.87	-1.90	0.844			
SNF days	-65.25	-6.95	0.53	840.47*** †	35.06	<0.01	-21.20	-1.99	0.850			
HH visits	-144.64	-4.25	0.66	790.42*	26.45	0.07	-724.60	-18.4	0.108			
HH episodes	1.73	1.48	0.74	-12.63	-12.30	0.62	-10.33 †	-8.70	0.242			
Hospice days	636.60	27.04	0.19	-1656.50	-89.90	0.40	76.79	2.983	0.910			
Imaging, procedures, and tests	1149.64	3.93	0.25	-47.65	-0.16	0.98	506.13	1.69	0.307			
AWV	-67.08**	-20.72	0.02	-149.00*	-48.10	0.07	-131.04***	-43.3	0.000			
Quality of Care (per 1,000 BPY)												
ACS hospitalizations	0.8	3.01	0.79	12.37**	40.82	0.01	3.46	11.50	0.295			
Unplanned 30-day readmissions	-17.82*	-16.82	0.01	-29.05	-24.00	0.51	-15.18	-12.1	0.323		X	

NOTE: PBPY=per beneficiary per year; BPY=beneficiary per year. Asterisks denote significance at *p<0.10, **p<0.05, ***p<0.01. † indicates that the coefficient for the linear interaction term was significant, which indicates diverging trends in the baseline period between the VTAPM and comparison groups.

Appendix Exhibit E.6.2: Comparison of State-Level Findings, Alternative Comparison Group Specifications (PY1)

	Method #1			Method #2			Revised Method #2			Difference in Impact Estimates		
	Estimate	% Impact	p	Estimate	% Impact	p	Estimate	% Impact	p	Sign	Sig	Both
Spending ($ PBPY)												
Total Medicare spending (Parts A and B)	-50.65	-0.52	0.85	-134.79	-1.24	0.70	-374.11 †	-3.39	0.186			
Utilization (per 1,000 BPY)												
Acute care stays	-4.91 †	-2.07	0.51	3.68 †	1.39	0.75	-10.94* †	-4.09	0.084		X	
Acute care days	11.48 †	0.96	0.83	9.76 †	0.73	0.91	-39.25 †	-2.91	0.274			
ED visits and observation stays	29.92**	5.12	0.05	14.17	1.99	0.70	11.06	1.690	0.390		X	
E&M visits	-346.62	-2.37	0.27	128.53	0.92	0.68	-316.86* †	-2.20	0.067			
Primary E&M visits	245.45 †	3.72	0.17	353.93**	5.51	0.05	147.82	2.24	0.345			
Specialty E&M visits	-915.42*** †	-10.81	<0.01	-417.57** †	-5.32	0.02	-615.82*** †	-7.70	0.000			
SNF stays	0.59	1.12	0.86	4.68	7.00	0.59	-0.22 †	-0.38	0.939	X		
SNF days	-20.87	-1.56	0.83	46.57	3.21	0.85	-11.91	-0.79	0.908			
HH visits	175.23	5.76	0.33	-99.01	-2.31	0.76	1.37	0.031	0.993			
HH episodes	1.36	1.04	0.84	-6.56	-4.23	0.57	-10.05* †	-6.83	0.096			X
Hospice days	-91.09 †	-9.90	0.65	60.55	7.05	0.85	82.54 †	8.076	0.381	X		
Imaging, procedures, and tests	770.88	2.53	0.26	934.84	3.14	0.15	1311.53***	4.29	0.004		X	
AWV	-2.88 †	-0.91	0.87	-0.99 †	-0.30	0.96	-21.07	-6.58	0.161			
Quality of Care (per 1,000 BPY)												
ACS hospitalizations	1.83	5.47	0.26	2.54	7.76	0.38	1.37	4.171	0.264			
Unplanned 30-day readmissions	-6.66	-5.42	0.52	-10.56	-8.45	0.53	-17.66*** †	-14.5	0.010		X	

NOTE: PBPY=per beneficiary per year; BPY=beneficiary per year. Asterisks denote significance at *p<0.10, **p<0.05, ***p<0.01. † indicates that the coefficient for the linear interaction term was significant, which indicates diverging trends in the baseline period between the VTAPM and comparison groups.

Appendix F. Supporting Documentation for Chapter 2

Appendix F.1: Statewide Financial Targets and Benchmarks

The state agreement set the PY1 benchmarks based on Annual Projected National Medicare TCOC per Beneficiary Growth rate as follows:

- Below 2.7 percent, the initial benchmark would be set at 1.0 percent above the projection, and each subsequent PY2-5 benchmark would be set at 0.2 percent below each new projection.
- Between 2.7 percent and 3.7 percent, the initial benchmark would be set at 3.5 percent, and each subsequent PY2-5 benchmark would be set at 0.2 percent below each new projection.
- Above 3.7 percent, the initial benchmark would be set at 0.1 percent below the projection, and each subsequent PY2-5 benchmark would be set at 0.1 percent below each new projection.

Appendix G. Supporting Documentation for Chapter 3

Appendix Exhibit G.1: OneCare's 2018 and 2019 Population Health Initiatives

Program	Description	Recipient	2018 Budget Total	2019 Budget Total	Medicare Per- PBPM payment
Continuing Care Coordination Programs					
Supports and Services at Home (SASH)	Connects local health and long-term care systems for Medicare beneficiaries to support aging at home through partnerships with housing organizations, HH agencies, Area Agencies on Aging, and designated mental health agencies. Funds both participating and non-participating communities. Previously funded under the MAPCP demonstration.	Care coordination at senior housing	$3,269,594	$3,815,532	$72,450 per 100-person panel (2017 payment model of $70,000 per 100-person panel plus 3.5%)
Community Health Teams	Blueprint community health teams for both risk and non-risk communities. Previously funded under the MAPCP demonstration.	Regional Financial Administrator for HSA	$2,518,898	$2,411,679	Varies by community on formula of Blueprint-attributed claims volume
Blueprint PCMHs	Support PCMHs for both risk and non-risk communities. Previously funded under the MAPCP demonstration. (Note: Medicaid and BCBSVT funds go directly to the Blueprint, not through OneCare.)	NCQA-certified PCMHs in the Blueprint for Health	$1,973,649	$1,830,264	$2.59 PBPM

Program	Description	Recipient	2018 Budget Total	2019 Budget Total	Medicare Per- PBPM payment
New Care Coordination Programs Under the All-Payer Model					
OneCare Basic Care Coordination Payments	Intended to support engaging in quality measurement, participating in quality improvement activities, and other activities related to population health.	Practices of aligned providers, primarily primary care providers	$4,781,010	$5,935,530	$3.25 PBPM
OneCare Complex Care Coordination Program	Intended to provide proactive and preventive care to high- and very high-risk beneficiaries (16%) in an effort to reduce spending	Primary care practices, designated mental health agencies, home health agencies, and/or Area Agencies on Aging	$7,064,722	$9,181,362	$15.00 PBPM, $150 initial payment for lead agency
Comprehensive Payment Reform Program	Blended capitation model for independent primary care practices and FQHCs with a minimum of 500 attributed beneficiaries	In PY2, OneCare expanded this model from the three pilot primary care practices to nine practices.	$1,800,000	$2,250,000	n/a
Specialist Payment Pilot	Pilot programs to support coordinated efforts between primary and specialty care to address patients' needs	Specialists	n/a	$2,000,000	n/a
Primary Prevention and Adverse Childhood Events Pilot	Pilot program in collaboration with the Developmental Understanding and Legal Collaboration for Everyone Program and the Vermont Department of Health to support the SDOH needs of infants from birth to six months	Primary care providers	n/a	$910,720	n/a

Program	Description	Recipient	2018 Budget Total	2019 Budget Total	Medicare Per- PBPM payment
Other Population Health Programs					
Value-Based Incentive Fund	A fund to incentivize meeting/exceeding quality performance program metrics	Primary care providers (70%) and specialists (30%)	$4,305,223	$7,537,231	n/a
RiseVT	Community-based primary prevention program emphasizing healthy lifestyles. Under the VTAPM and a partnership between RiseVT and OneCare beginning in 2018, the program has now spread to 20 communities throughout the state.	Community-based organizations	$1,200,000	n/a[29]	n/a
Innovation Fund	Grant funds that would support innovative evidenced-based (or informed) programs that align with OneCare's priorities and could be readily spread and sustained by the ACO and participating communities.	OneCare participant, preferred provider, or collaborator	n/a	$1,000,000	n/a
Regional Clinical Representatives	OneCare employed local clinical leaders who support community-level population health initiatives.	13 local providers and one pediatrician (working statewide)	n/a	$375,000	n/a

Sources: OneCare Vermont's 2018 and 2019 Budget Submission and 2018 and 2019 GMCB Budget Order, available at: https://gmcboard.vermont.gov/content/2018-aco-oversight. https://gmcboard.vermont.gov/sites/gmcb/files/documents/GMCB%20ACO%20Budget%20Submission%202019%20Final%20%28Supplemental%20Attachment%29.pdf https://gmcboard.vermont.gov/sites/gmcb/files/FINAL%20%202019%20ACO%20Budget%20Order%202_5_2019.pdf .

[29] RiseVT has been integrated into OneCare's operations, adding employees and programmatic spending to the ACO's administrative costs.

Appendix Exhibit G.2: Population Health Measures

	Measure	Population	Source
Population-Level Health Outcome Targets	Deaths Related to Drug Overdose	Statewide	VT Department of Health, Alcohol and Drug Abuse Programs
	Deaths Related to Suicide	Statewide	VT Department of Health, Vital Statistics; Vital Statistic Bulletin 2017
	COPD Prevalence	Statewide	VT Behavioral Risk Factor Surveillance System
	Diabetes Prevalence	Statewide	VT Behavioral Risk Factor Surveillance System
	Hypertension Prevalence	Statewide	VT Behavioral Risk Factor Surveillance System
	Percentage of Adults with Personal Doctor or Care Provider	Statewide	VHCURES
Health-Care Delivery System Targets	Initiation of Alcohol and Other Drug Dependence Treatment	Multi-Payer ACO	VHCURES
	Engagement of Alcohol and Other Drug Dependence Treatment	Multi-Payer ACO	VHCURES
	30-Day Follow Up after Discharge from ED for Mental Health	Multi-Payer ACO	VHCURES
	30-Day Follow-Up after Discharge for Alcohol or Other Drug Dependence	Multi-Payer ACO	VHCURES
	Number of Mental Health and Substance Abuse-Related ED Visits	Statewide	VHCURES
	Diabetes HbA1c Poor Control	Medicare ACO	CMS, 2019 specification
	Controlling High Blood Pressure	Medicare ACO	CMS, 2019 specification
	All-Cause Unplanned Admissions for Patients with Multiple Chronic Conditions	Medicare ACO	CMS, 2019 specification
	ACO CAHPS Composite: Getting Timely Care, Appointments and Information	Medicare ACO	CMS, 2018 specification

	Measure	Population	Source
Process Milestones	Percentage of Vermont Providers Checking Prescription Drug Monitoring Program Before Prescribing Opioids	Statewide	VT Department of Health, Alcohol and Drug Abuse Programs
	Adults Receiving Medication Assisted Treatment (MAT)	Statewide, Ages 18-64	VT Department of Health, Alcohol and Drug Abuse Programs
	Screening and Follow Up for Clinical Depression and Follow-Up Plan	Multi-Payer ACO	ACO-payer contract results
	Screening and Follow Up for Clinical Depression and Follow-Up Plan	Multi-Payer ACO	ACO-payer contract results
	Tobacco Use Assessment and Cessation Intervention	Multi-Payer ACO	VHCURES
	Percentage of Vermont Residents Receiving Appropriate Asthma Medication Management	Statewide	VHCURES
	Percentage of Medicaid Adolescents with Well-Care Visits	Statewide Medicaid	Department of VT Health Access

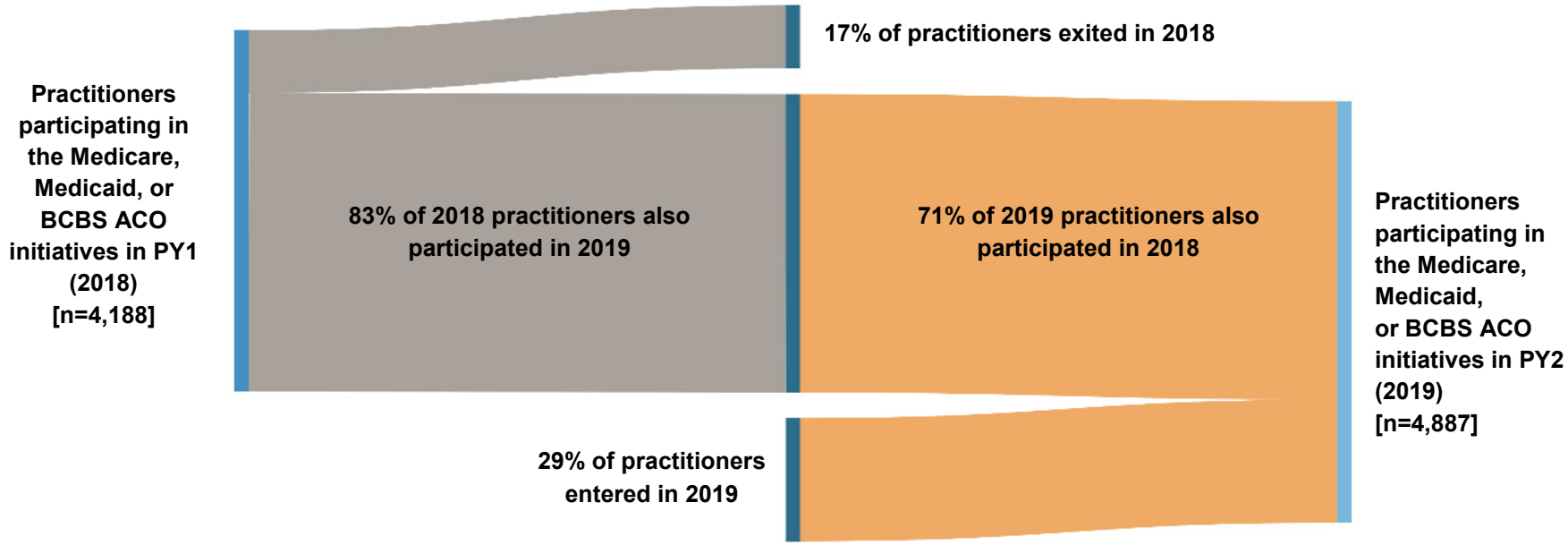
Appendix H. Supporting Documentation for Chapter 4

Appendix Exhibit H.1: Vermont, VTAPM, and Scale Target Populations by Payer

Payer	PY1			PY2		
	2018 Vermont Population	VTAPM Population	Population Participating in Scale Target ACO Initiatives	2019 Vermont Population	VTAPM Population	Population Participating in Scale Target ACO Initiatives
Medicare	117,796	113,272	39,230	121,145	113,743	53,973
Medicaid	140,822	135,879	42,342	135,639	130,004	75,712
Commercial: Self-Funded Employers	166,996	166,996	9,874	171,794	171,794	10,021
Commercial: Fully Insured	136,698	92,978	20,838	119,134	93,437	20,342
Commercial: MA	12,693	12,693	-	17,745	17,745	-
Tricare	16,900	-	-	13,166	-	-
FEHBP	14,594	-	-	14,687	-	-
Uninsured	19,800	-	-	24,988	-	-
Total	**626,299**	**521,818**	**112,284**	**618,298**	**526,723**	**160,048**

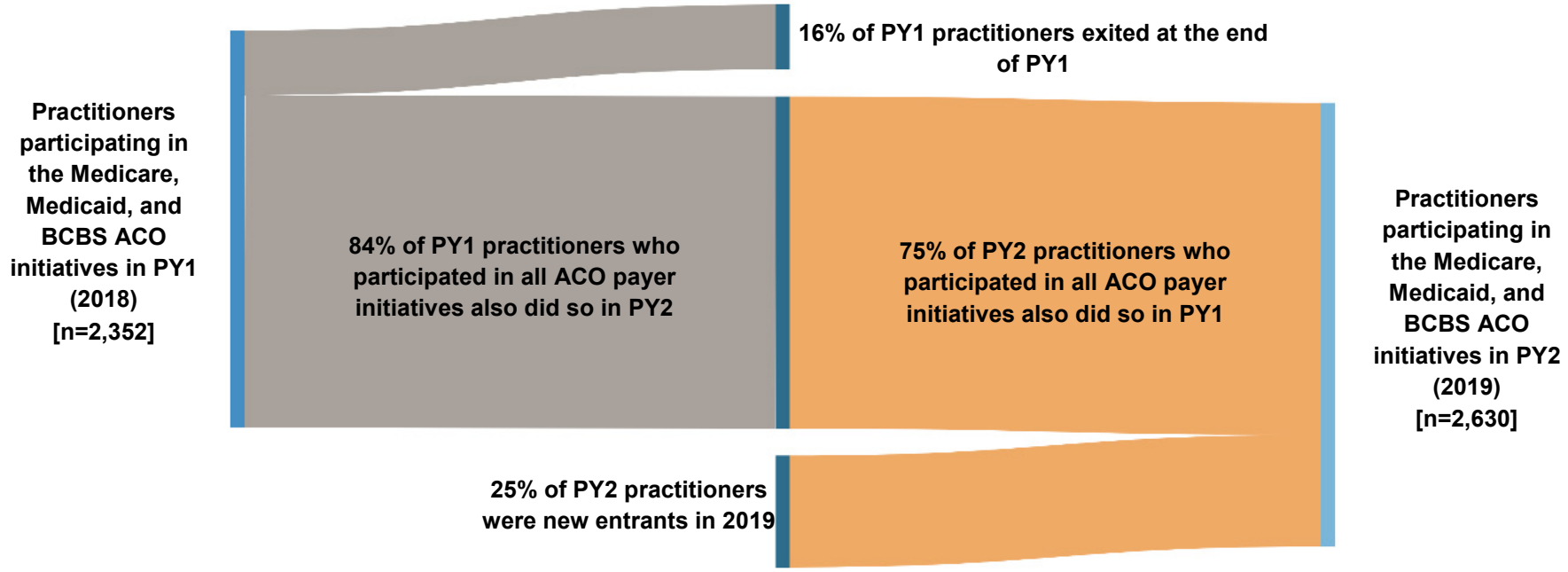
SOURCE: GMCB Vermont All-Payer ACO Model Annual ACO Scale Targets and Alignment Reports.

Appendix Exhibit H.2: Change in Participation in the VTAPM ACO Initiatives between PY1 and PY2



SOURCE: NORC analysis of VTAPM ACO Provider List.
NOTE: Participating practitioners are those listed on any payers' (Medicare, Medicaid, BCBS) VTAPM Provider Files in PY1 (2018) or PY2 (2019).

Appendix Exhibit H.3: Change Participation across All VTAPM ACO Initiatives between PY1 and PY2



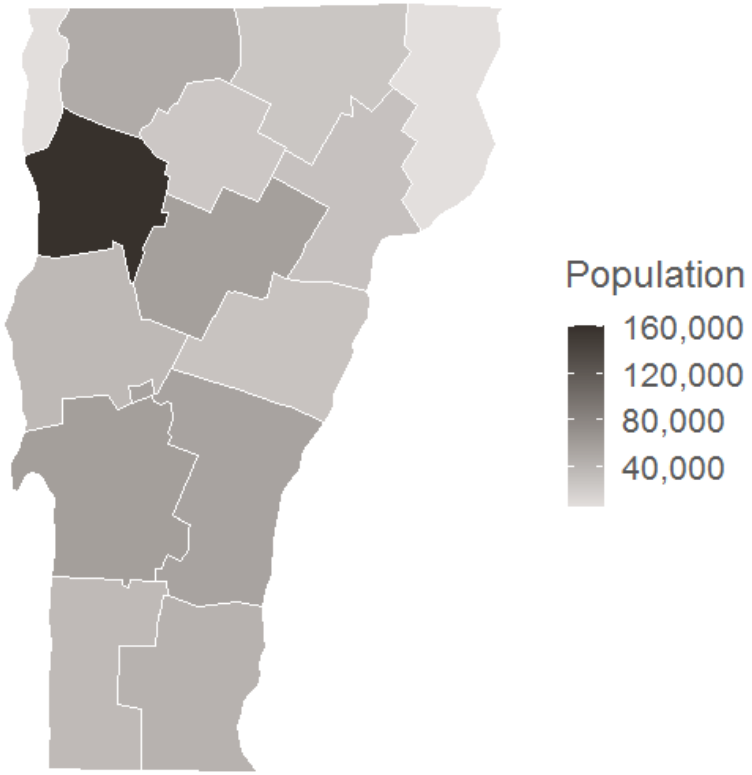
SOURCE: NORC analysis of VTAPM ACO Provider List.
NOTE: Participating practitioners represented in this exhibit were listed on all three payers' (Medicare, Medicaid, BCBS) VTAPM Provider Files in PY1 (2018) or PY2 (2019).

Appendix Exhibit H.4: Practitioner Participation by VTAPM ACO Initiative and County

	PY1		PY2		PY1		PY2		PY1		PY2	
	Medicare				Medicaid				Commercial (BCBS)			
County	Participants (N)	Eligible Non-Participants (N)	Participants (N)	Eligible Non-Participants (N)	Participants (N)	Eligible Non-Participants (N)	Participants (N)	Eligible Non-Participants (N)	Participants (N)	Eligible Non-Participants (N)	Participants (N)	Eligible Non-Participants (N)
Addison	107	71	113	64	159	221	145	281	155	224	142	265
Bennington	6	250	165	106	155	362	180	408	8	505	167	385
Caledonia	-	155	-	151	2	330	134	252	2	334	-	355
Chittenden	1,046	632	1,295	523	1,366	2,199	1,447	2,625	1,378	2,216	1,376	2,497
Essex	-	14	-	12	-	20	9	13	-	22	-	20
Franklin	121	88	129	54	227	230	228	279	206	241	218	264
Grand Isle	-	1	9	2	1	10	9	14	-	10	6	12
Lamoille	-	114	-	118	2	276	1	314	2	275	1	307
Orange	-	128	1	123	-	277	127	199	-	276	-	294
Orleans	-	114	-	127	59	188	77	222	1	235	1	272
Rutland	4	331	18	300	5	660	246	518	5	663	15	685
Washington	311	150	356	152	383	544	344	654	386	543	329	615
Windham	131	197	131	159	235	524	216	600	233	525	211	572
Windsor	111	172	198	122	172	539	220	619	111	585	199	603
Non-Vermont	3	-	5	-	980	-	1,124	-	1,387	-	1,047	-

SOURCE: NORC analysis of VTAPM ACO Provider Lists, Medicare Professional FFS claims, and CMS Public Use File (PECOS & NPPES).
NOTE: We used the VTAPM Provider Files to identify the VTAPM ACO participants. We identified the eligible, non-participants based on their specialty designation; non-participants needed to have one or more of the specialty designations held by the participants. For the Medicare ACO participants and eligible non-participants, we utilized Medicare claims to measure the volume of services provided in each county by the practitioners and attributed the practitioners to the county in which they provided the plurality of the services. We utilized specialty codes in NPPES to identify non-participating practitioners who were eligible to participate in the Medicaid and BCBS ACO initiatives; NORC did not have access to usable Medicaid and BCBS claims data to validate the eligibility criteria. We used a combination of PECOS and NPPES data to attribute Medicaid and BCBS ACO participants and eligible, non-participants to a specific Vermont county.

Appendix Exhibit H.5: Vermont Population by County



SOURCE: Analysis of 2017 American Community Survey (ACS) 5-year estimates by NORC.

Appendix Exhibit H.6: Practice Participation by Practice Type and Practitioner Participation by Specialty Designation

	Performance Year 1							Performance Year 2						
		VTAPM Participants							VTAPM Participants					
			VTAPM Participants Participating in…							VTAPM Participants Participating in…				
	Total	All VTAPM Participants	All-Payer Models	The Medicare Payer Model	The Medicaid Payer Model	The BCBS Payer Model	Non-Participants	Total	All VTAPM Participants	All-Payer Models	The Medicare Payer Model	The Medicaid Payer Model	The BCBS Payer Model	Non-Participants
Practices and Health Centers														
Practices (TIN)	801	80	46	48	78	60	721	826	88	59	65	83	74	738
CAHs	8	2	2	2	2	2	6	8	6	3	3	6	3	2
FQHCs	47	14	8	8	14	8	33	48	38	14	15	38	15	10
RHCs	9	1	1	1	1	1	8	10	9	0	0	9	0	1
Practitioners (NPI)														
All practitioners affiliated with eligible practices	6,274	4,188	2,352	2,354	3,746	3,874	2,086	6,645	4,887	2,630	3,092	4,507	3,712	1,758
Primary care specialty	2,332	1,645	889	889	1,489	1,483	687	2,420	2,039	1,040	1,221	1,933	1,448	381
Non-physician primary care specialists	1,178	798	434	434	713	724	380	1,241	1,025	507	611	956	717	216
Eligible specialists	684	507	272	272	455	486	177	669	557	286	334	513	453	112
Other*	3,258	2,036	1,191	1,193	1,802	1,905	1,222	3,556	2,291	1,304	1,537	2,061	1,811	1,265

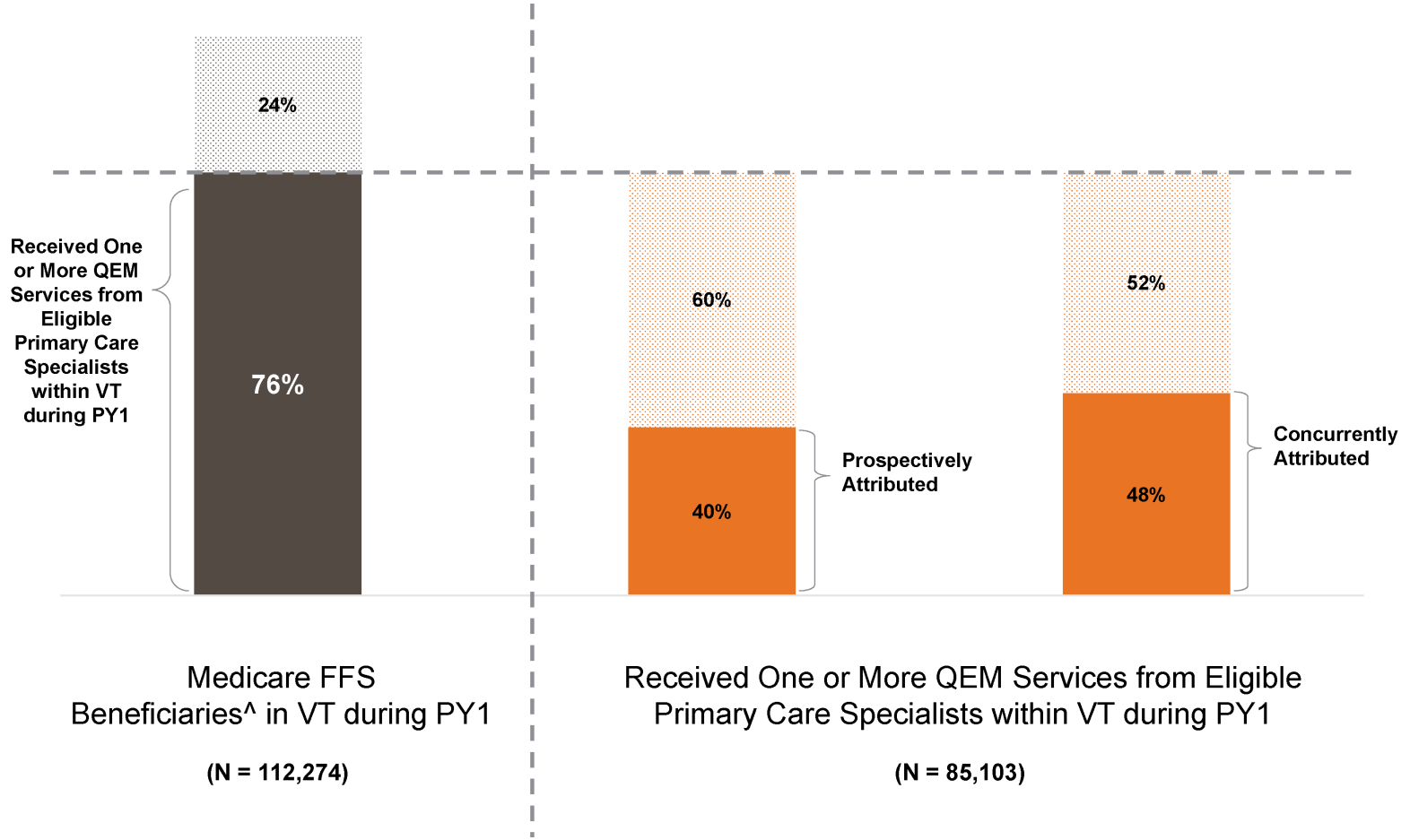
SOURCE: Analysis of Medicare provider and claims data by NORC.
NOTE: *Other represents attribution ineligible practitioners. VTAPM participants include all practices and practitioners listed in the VTAPM ACO Provider Files. Eligible non-participants are practitioners with one or more eligible specialty designations who billed Medicare for services rendered within Vermont in the PY.

Appendix Exhibit H.7: Practice Participation in the VTAPM Medicare ACO Initiative

	Performance Year 1				Performance Year 2			
	Medicare Attribution-Eligible Practices				Medicare Attribution-Eligible Practices			
	Total (Excludes Preferred Practices) (N)	Participants (N)	Non-Participants (N)	Preferred Practices (N)	Total (Excludes Preferred Practices) (N)	Participants (N)	Non-Participants (N)	Preferred Practices (N)
Practices and Health Centers								
Practices (TIN)	196	17	179	31	192	23	169	30
CAHs	8	2	6	-	8	3	5	
FQHCs	46	7	39	-	42	13	29	-
RHCs	9	1	8	-	8	0	8	-
Practice Size: 1-15 Practitioners	214	15	199	14	210	26	184	17
Practice Size: 16-50 Practitioners	16	2	14	1	18	4	14	2
Practice Size: 51+ Practitioners	21	6	15	1	18	8	10	0
Prior Medicare SSP Experience	102	21	81	21	95	31	64	14

SOURCE: Analysis of Medicare provider and claims data by NORC.
NOTE: We used the VTAPM Provider Files to identify the VTAPM ACO participants. We identified the eligible non-participants based on their specialty designation; non-participants needed to have one or more of the specialty designations held by the participants. For the Medicare ACO participants and eligible non-participants, we utilized Medicare claims to measure the volume of services provided in each county by the practitioners and attributed the practitioners to the county in which they provided the plurality of the services. Preferred providers are selected by the VTAPM ACO for their ability to contribute to the VTAPM ACO's success but their patient panels do not qualify for attribution to the Medicare ACO initiative and they are not required to participate in quality reporting (definition from: https://www.jonesday.com/en/insights/2015/04/hhs-announces-next-generation-aco-model-of-payment-and-care-delivery).

Appendix Exhibit H.8: Alternative Attribution Rates for PY1



SOURCE: Analysis of Medicare claims data by NORC.
NOTE: ^ FFS Parts A & B coverage, no MA coverage during the year, and Medicare was not a secondary payer at any point during the year.

Appendix Exhibit H.9: Characteristics of the Attributed and the Eligible, Non-Attributed Vermont Medicare Beneficiary Population

	PY1			PY2		
	Prospective Attribution	**Concurrent Attribution**	**Not Attributed**	**Prospective Attribution**	**Concurrent Attribution**	**Not Attributed**
Number of beneficiaries	33,867	40,727	41,572	48,817	53,915	28,854
Total Person-Months	397,769.25	482,651.25	492,564.97	573,872.08	639,096.11	341,699.49
Mean Months of Alignment (SD)	11.75 (1.43)	11.85 (1.02)	11.85 (1.03)	11.76 (1.39)	11.85 (1.01)	11.84 (1.06)
Mean Age (SD)	72.54 (11.86)	71.96 (11.9)	71.67 (12.33)	72.65 (11.99)	72.02 (11.9)	71.81 (12.03)
Gender (%)						
Male	43.27%	43.18%	44.80%	43.63%	43.56%	45.71%
Race/Ethnicity (%)						
White	94.82%	94.54%	94.79%	94.25%	93.94%	94.96%
Black	0.39%	0.44%	0.37%	0.50%	0.51%	0.25%
Hispanic	0.72%	0.71%	0.63%	0.73%	0.74%	0.53%
Asian	0.52%	0.52%	0.49%	0.69%	0.74%	0.30%
Other	3.56%	3.79%	3.71%	3.83%	4.07%	3.95%
Location (%)						
Rural	60.13%	62.06%	87.70%	63.98%	63.65%	94.57%
Disability/ESRD (%)						
Disability	15.26%	15.56%	16.99%	15.10%	15.34%	16.42%
ESRD	0.38%	0.39%	0.43%	0.40%	0.41%	0.41%
Coverage (%)						
Any Dual Eligibility	26.91%	26.60%	31.86%	27.61%	26.81%	31.32%
Any Part D Coverage	83.32%	83.61%	84.36%	83.72%	83.93%	84.75%
Chronic Conditions						
Mean No. of Chronic Conditions (SD)	4.46 (3.45)	4.28 (3.44)	4.33 (3.43)	4.53 (3.49)	4.32 (3.47)	4.44 (3.45)
Spending/utilization						
Hospitalization, in %	15.67%	15.83%	16.92%	15.37%	15.30%	16.69%
Mortality (%)						
Death in Reference Period	4.07%	2.88%	3.01%	3.92%	2.80%	2.96%

SOURCE: Analysis of Medicare claims data by NORC.

Appendix I. Supporting Documentation for Chapter 5

Appendix Exhibit I.1: PY1 ACO-Level: Descriptive Characteristics of VTAPM and Weighted Comparison Beneficiaries

	Baseline Period						Performance Period	
	BY3		BY2		BY1		PY1	
	VTAPM	Comparison	VTAPM	Comparison	VTAPM	Comparison	VTAPM	Comparison
Number of Beneficiaries	33985	33985	36213	36213	37119	37119	40274	40274
Total Person-Months	402481.7	402481.8	428331	428331.1	439580	439579.9	477253.3	477253.3
Variables Included in Propensity Score Models								
Mean Months of Alignment ± SD	11.8 ± 1.0	11.8 ± 1.1	11.8 ± 1.1	11.8 ± 1.1	11.8 ± 1.1	11.8 ± 1.0	11.9 ± 1.0	11.9 ± 1.0
Mean Age ± SD	71.6 ± 12.7	71.6 ± 12.5	71.6 ± 12.4	71.6 ± 12.4	71.8 ± 12.2	71.8 ± 12.1	72.0 ± 11.9	72.0 ± 11.8
Gender (%)								
Male	43.1	43.1	43.0	43.0	42.9	42.9	43.1	43.1
Race/Ethnicity (%)								
White	96.3	96.3	95.8	95.8	95.3	95.3	94.5	94.5
Black	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Hispanic	0.7	0.7	0.8	0.8	0.8	0.8	0.7	0.7
Asian	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Other	2.1	2.1	2.6	2.6	3.1	3.1	3.8	3.8
Disability/ESRD (%)								
Disability	17.3	17.3	17.1	17.1	16.5	16.5	15.5	15.5
ESRD	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Coverage (%)								
Any Dual Eligibility	30.3	29.8	29.8	29.6	28.9	28.1	26.6	25.9
Any Part D Coverage	73.9	73.9	82.0	81.9	82.9	82.7	83.6	83.3
Chronic Conditions								
Mean No. of Chronic Conditions ± SD	4.1 ± 3.2	4.1 ± 3.3	4.1 ± 3.2	4.1 ± 3.3	4.1 ± 3.3	4.1 ± 3.4	4.3 ± 3.4	4.3 ± 3.5
Alzheimer's/Dementia (%)	5.6	5.6	5.4	5.4	5.2	5.2	5.4	5.4
Chronic Kidney Disease (%)	10.5	10.5	11.4	11.4	12.6	12.6	16.4	16.4
COPD (%)	9.1	9.1	9.2	9.2	9.3	9.3	9.0	9.0
Congestive Heart Failure (%)	8.5	8.5	8.4	8.4	8.4	8.4	8.3	8.3

	Baseline Period						Performance Period	
	BY3		BY2		BY1		PY1	
	VTAPM	Comparison	VTAPM	Comparison	VTAPM	Comparison	VTAPM	Comparison
Diabetes (%)	22.5	22.5	22.1	22.1	21.3	21.3	20.8	20.8
Ischemic Heart Disease (%)	21.9	21.9	21.6	21.6	21.5	21.5	22.2	22.2
Depression (%)	19.8	19.8	20.0	20.0	20.4	20.4	19.8	19.8
RA/OA (%)	26.7	26.7	27.5	27.5	28.5	28.5	29.4	29.4
Stroke/TIA (%)	2.2	2.2	2.1	2.1	2.2	2.2	2.1	2.1
Cancer (%)	7.9	7.6	7.7	7.7	7.7	7.7	7.8	7.7
Mortality (%)								
Death in Reference Period	3.0	3.0	3.2	3.2	3.1	3.1	2.9	2.9
Community Characteristics								
Median Income ($ ± SD)	60,879 ± 14,509	63,805 ± 21,957	60,824 ± 14,538	63,520 ± 22,370	60,919 ± 14,536	62,294 ± 20,237	61,156 ± 14,660	62,347 ± 20,084
Below Poverty Line (% ± SD)	10.8 ± 6.1	11.1 ± 5.6	10.8 ± 6.1	11.2 ± 5.6	10.7 ± 6.0	11.1 ± 5.4	10.7 ± 6.0	11.1 ± 5.4
Bachelor's Degree or Higher (% ± SD)	38.8 ± 14.1	37.8 ± 17.0	38.7 ± 14.1	38.0 ± 17.1	38.6 ± 14.2	37.0 ± 16.6	38.9 ± 14.2	37.3 ± 16.5
Unemployment (% ± SD)	4.8 ± 2.2	6.0 ± 3.2	4.8 ± 2.2	6.1 ± 3.3	4.8 ± 2.2	6.0 ± 3.3	4.8 ± 2.2	6.0 ± 3.1
Uninsured (% ± SD)	4.8 ± 2.0	9.0 ± 4.7	4.8 ± 2.1	9.0 ± 4.7	4.8 ± 2.1	9.0 ± 4.8	4.8 ± 2.1	9.1 ± 4.8
SSI (% ± SD)	5.7 ± 2.5	3.9 ± 2.7	5.7 ± 2.5	3.9 ± 2.7	5.7 ± 2.5	4.0 ± 2.7	5.6 ± 2.5	3.9 ± 2.7
Rurality (%)	61.7	58.6	61.9	60.2	62.1	61.5	61.8	60.5
Alignment-Eligible Providers (per 1,000)	2.6 ± 1.5	1.6 ± 1.3	2.6 ± 1.6	1.6 ± 1.3	2.6 ± 1.6	1.7 ± 1.3	2.8 ± 1.8	1.9 ± 1.5
Participation in Medicare ACOs and Other CMMI Initiatives (%)								
Pioneer/MSSP	87.5	17.2	74.7	26.7	71.6	50.6	0.1	77.4
FAI	0.0	2.0	0.0	3.0	0.0	2.7	0.0	1.2
IAH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CPC	0.0	2.0	0.0	2.0	0.0	1.9	0.1	8.8
BPCI	0.0	0.1	0.0	1.0	0.1	1.5	0.0	0.9
CJR	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.2
OCM	0.0	0.0	0.0	0.0	2.0	1.9	2.3	2.0

NOTE: SD=standard deviation; ESRD=end-stage renal disease; COPD=chronic obstructive pulmonary disease; RA=rheumatoid arthritis; OA=osteoarthritis; TIA=transient ischemic attack; SSI=supplemental security income; MSSP=Medicare Shared Savings Program; FAI=Financial Alignment Initiative; IAH=Independence at Home; CPC=Comprehensive Primary Care (including CPC Plus); BPCI=Bundled Payments for Care Improvement; CJR=Comprehensive Care for Joint Replacement; OCM=Oncology Care Model.

Appendix Exhibit I.2: PY1 State-Level: Descriptive Characteristics of VTAPM and Weighted Comparison Beneficiaries

	Baseline Period						Performance Period	
	BY3		BY2		BY1		PY1	
	VTAPM	Comparison	VTAPM	Comparison	VTAPM	Comparison	VTAPM	Comparison
Number of Beneficiaries	77619	77619	77027	77027	80272	80272	81379	81379
Total Person-Months	918959.3	918959.3	911311.7	911311.8	950197.3	950197.3	964073.6	964073.6
Variables Included in Propensity Score Models								
Mean Months of Alignment ± SD	11.8 ± 1.1	11.8 ± 1.1	11.8 ± 1.1	11.8 ± 1.1	11.8 ± 1.1	11.8 ± 1.1	11.8 ± 1.0	11.8 ± 1.0
Mean Age ± SD	71.5 ± 12.9	71.4 ± 12.9	71.6 ± 12.7	71.5 ± 12.8	71.7 ± 12.4	71.6 ± 12.5	71.8 ± 12.1	71.8 ± 12.1
Gender (%)								
Male	43.2	43.2	43.7	43.7	43.9	43.9	44.0	44.0
Race/Ethnicity (%)								
White	96.4	96.4	95.9	95.9	95.4	95.4	94.7	94.7
Black	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Hispanic	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Asian	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5
Other	2.1	2.1	2.6	2.6	3.0	3.0	3.8	3.8
Disability/ESRD (%)								
Disability	18.2	18.2	17.8	17.8	17.2	17.2	16.2	16.2
ESRD	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Coverage (%)								
Any Dual Eligibility	33.3	33.0	32.2	32.2	31.5	30.8	29.3	28.6
Any Part D Coverage	76.0	76.0	82.4	82.1	83.3	83.1	84.0	83.7
Chronic Conditions								
Mean No. of Chronic Conditions ± SD	4.1 ± 3.2	4.1 ± 3.3	4.1 ± 3.2	4.1 ± 3.3	4.1 ± 3.3	4.1 ± 3.4	4.3 ± 3.4	4.3 ± 3.5
Alzheimer's/Dementia (%)	5.4	5.4	5.2	5.2	5.2	5.2	5.8	5.8
Chronic Kidney Disease (%)	10.5	10.5	11.1	11.1	12.2	12.2	16.1	16.1
COPD (%)	9.5	9.5	9.5	9.5	9.7	9.7	9.7	9.7
Congestive Heart Failure (%)	8.4	8.4	8.2	8.2	8.2	8.2	8.2	8.2

	Baseline Period						Performance Period	
	BY3		BY2		BY1		PY1	
	VTAPM	Comparison	VTAPM	Comparison	VTAPM	Comparison	VTAPM	Comparison
Diabetes (%)	22.4	22.4	22.1	22.1	21.5	21.5	21.2	21.2
Ischemic Heart Disease (%)	21.2	21.2	21.1	21.1	21.1	21.1	21.5	21.5
Depression (%)	19.0	19.0	19.0	19.0	19.7	19.7	19.7	19.7
RA/OA (%)	26.0	26.0	26.9	26.9	28.0	28.0	29.3	29.3
Stroke/TIA (%)	2.2	2.2	2.1	2.1	2.2	2.2	2.1	2.1
Cancer (%)	7.5	7.4	7.5	7.5	7.4	7.4	7.6	7.5
Mortality (%)								
Death in Reference Period	3.1	3.1	3.2	3.2	3.1	3.1	3.0	3.0
Community Characteristics								
Median Income ($ ± SD)	56,818 ± 14,149	60,385 ± 22,396	57,156 ± 14,249	60,825 ± 23,030	57,075 ± 14,271	60,011 ± 22,124	57,381 ± 14,399	60,474 ± 22,457
Below Poverty Line (% ± SD)	11.7 ± 6.0	11.9 ± 6.1	11.6 ± 6.0	11.8 ± 6.1	11.6 ± 6.0	11.9 ± 6.1	11.5 ± 6.0	11.8 ± 6.1
Bachelor's Degree or Higher (% ± SD)	35.8 ± 13.5	33.3 ± 16.6	36.1 ± 13.5	33.9 ± 16.7	36.0 ± 13.5	33.5 ± 16.4	36.2 ± 13.5	34.0 ± 16.4
Unemployment (% ± SD)	5.0 ± 2.2	6.2 ± 3.7	4.9 ± 2.2	6.2 ± 3.7	5.0 ± 2.2	6.2 ± 3.6	5.0 ± 2.2	6.1 ± 3.7
Uninsured (% ± SD)	5.3 ± 2.3	9.7 ± 5.2	5.2 ± 2.3	9.7 ± 5.2	5.2 ± 2.3	9.8 ± 5.2	5.2 ± 2.3	9.8 ± 5.2
SSI (% ± SD)	6.1 ± 2.9	4.4 ± 2.8	6.1 ± 2.8	4.3 ± 2.8	6.1 ± 2.8	4.3 ± 2.8	6.1 ± 2.8	4.3 ± 2.7
Rurality (%)	75.5	67.9	74.8	68.0	74.9	68.4	74.3	67.4
Alignment-Eligible Providers (per 1,000)	2.5 ± 1.5	1.7 ± 1.5	2.5 ± 1.5	1.7 ± 1.5	2.5 ± 1.5	1.8 ± 1.5	2.6 ± 1.7	1.9 ± 1.5
Participation in Medicare ACOs and Other CMMI Initiatives (%)								
Pioneer/MSSP	73.2	20.4	65.4	25.1	59.3	26.9	0.2	33.4
FAI	0.0	1.6	0.0	2.0	0.0	1.1	0.0	0.5
IAH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CPC	0.0	2.8	0.0	3.3	0.0	3.4	0.2	9.5
BPCI	0.1	0.1	0.2	0.8	0.2	1.2	0.1	0.9
CJR	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.1
OCM	0.0	0.0	0.0	0.0	1.8	1.8	2.2	2.2

NOTE: SD=standard deviation; ESRD=end-stage renal disease; COPD=chronic obstructive pulmonary disease; RA=rheumatoid arthritis; OA=osteoarthritis; TIA=transient ischemic attack; SSI=supplemental security income; MSSP=Medicare Shared Savings Program; FAI=Financial Alignment Initiative; IAH=Independence at Home; CPC=Comprehensive Primary Care (including CPC Plus); BPCI=Bundled Payments for Care Improvement; CJR=Comprehensive Care for Joint Replacement; OCM=Oncology Care Model.

Appendix Exhibit I.3: PY2 ACO-Level: Descriptive Characteristics of VTAPM and Weighted Comparison Beneficiaries

	Baseline Period						Performance Period	
	BY3		BY2		BY1		PY2	
	VTAPM	Comparison	VTAPM	Comparison	VTAPM	Comparison	VTAPM	Comparison
Number of Beneficiaries	43084	43084	45742	45742	49907	49907	53371	53371
Total Person-Months	510129.6	510129.9	541098.1	541098.1	590907.3	590907.3	632628.8	632628.8
Mean Months of Alignment ± SD	11.8 ± 1.1	11.8 ± 1.1	11.8 ± 1.1	11.8 ± 1.1	11.8 ± 1.1	11.8 ± 1.1	11.9 ± 1.0	11.9 ± 1.0
Mean Age ± SD	71.4 ± 12.9	71.4 ± 12.8	71.5 ± 12.7	71.4 ± 12.6	71.7 ± 12.4	71.6 ± 12.5	72.0 ± 11.9	72.0 ± 12.0
Gender (%)								
Male	42.8	42.8	42.8	42.8	42.8	42.8	43.5	43.5
Race/Ethnicity (%)								
White	96.2	96.1	95.6	95.6	95.2	95.2	93.9	93.9
Black	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Hispanic	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.7
Asian	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7
Other	2.1	2.1	2.6	2.6	3.0	3.0	4.1	4.1
Disability/ESRD (%)								
Disability	18.2	18.2	17.8	17.8	17.1	17.1	15.3	15.3
ESRD	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Coverage (%)								
Any Dual Eligibility	32.2	31.9	31.5	31.5	30.4	29.8	26.8	26.2
Any Part D Coverage	75.0	74.9	82.1	82.1	83.1	82.9	83.9	83.7
Chronic Conditions								
Mean No. of Chronic Conditions ± SD	4.1 ± 3.2	4.1 ± 3.3	4.1 ± 3.2	4.1 ± 3.3	4.1 ± 3.3	4.1 ± 3.4	4.3 ± 3.5	4.3 ± 3.5
Alzheimer's/Dementia (%)	5.7	5.7	5.4	5.4	5.3	5.3	5.7	5.7
Chronic Kidney Disease (%)	10.7	10.7	11.3	11.3	12.4	12.4	16.7	16.7
COPD (%)	9.1	9.1	9.2	9.2	9.5	9.5	9.0	9.0
Congestive Heart Failure (%)	8.6	8.6	8.3	8.3	8.3	8.3	8.6	8.6
Diabetes (%)	22.1	22.2	21.7	21.7	21.3	21.3	20.5	20.5

	Baseline Period						Performance Period	
	BY3		BY2		BY1		PY2	
	VTAPM	Comparison	VTAPM	Comparison	VTAPM	Comparison	VTAPM	Comparison
Ischemic Heart Disease (%)	21.6	21.6	21.3	21.3	21.5	21.5	21.9	21.9
Depression (%)	19.9	19.9	19.8	19.8	20.3	20.3	20.0	20.0
RA/OA (%)	26.3	26.3	27.1	27.1	28.4	28.4	29.9	29.9
Stroke/TIA (%)	2.2	2.2	2.1	2.1	2.2	2.2	2.1	2.1
Cancer (%)	7.7	7.7	7.6	7.5	7.6	7.6	7.9	7.9
Mortality (%)								
Death in Reference Period	3.1	3.1	3.2	3.2	3.1	3.1	2.8	2.8
Community Characteristics								
Median Income ($ ± SD)	59,670 ± 14,387	63,225 ± 20,878	59,639 ± 14,392	63,256 ± 21,191	59,804 ± 14,448	63,122 ± 20,918	60,323 ± 14,740	64,077 ± 22,379
Below Poverty Line (% ± SD)	11.2 ± 6.3	10.9 ± 5.8	11.2 ± 6.3	10.9 ± 5.7	11.1 ± 6.3	10.8 ± 5.7	11.0 ± 6.4	10.7 ± 5.7
Bachelor's Degree or Higher (% ± SD)	38.2 ± 14.1	36.1 ± 16.2	38.2 ± 14.0	36.4 ± 16.3	38.1 ± 14.1	35.7 ± 16.1	38.6 ± 14.2	36.1 ± 16.2
Unemployment (% ± SD)	4.9 ± 2.2	6.1 ± 3.5	4.9 ± 2.2	6.1 ± 3.4	4.9 ± 2.2	6.0 ± 3.5	4.8 ± 2.2	5.9 ± 3.4
Uninsured (% ± SD)	5.0 ± 2.1	9.3 ± 4.8	5.0 ± 2.1	9.2 ± 4.8	4.9 ± 2.1	9.2 ± 4.8	4.9 ± 2.1	9.2 ± 4.9
SSI (% ± SD)	5.7 ± 2.6	4.1 ± 2.7	5.7 ± 2.6	4.0 ± 2.7	5.7 ± 2.6	4.0 ± 2.6	5.7 ± 2.6	3.9 ± 2.6
Rurality (%)	65.8	58.2	66.0	58.7	65.2	57.8	63.4	56.7
Alignment-Eligible Providers (per 1,000)	2.6 ± 1.6	1.6 ± 1.4	2.6 ± 1.6	1.7 ± 1.5	2.6 ± 1.6	1.8 ± 1.5	2.8 ± 1.8	1.9 ± 1.6
Participation in Medicare ACOs and Other CMMI Initiatives (%)								
Pioneer/MSSP	86.2	28.9	75.0	38.2	67.3	48.4	0.2	88.2
FAI	0.0	2.5	0.0	2.8	0.0	1.0	0.0	0.3
IAH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CPC	0.0	1.0	0.0	1.1	0.1	1.0	0.1	6.9
BPCI	0.0	0.2	0.1	1.0	0.1	1.3	0.0	1.6
CJR	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.2
OCM	0.0	0.0	0.0	0.0	0.0	0.5	0.0	0.6

NOTE: SD=standard deviation; ESRD=end-stage renal disease; COPD=chronic obstructive pulmonary disease; RA=rheumatoid arthritis; OA=osteoarthritis; TIA=transient ischemic attack; SSI=supplemental security income; MSSP=Medicare Shared Savings Program; FAI=Financial Alignment Initiative; IAH=Independence at Home; CPC=Comprehensive Primary Care (including CPC Plus); BPCI=Bundled Payments for Care Improvement; CJR=Comprehensive Care for Joint Replacement; OCM=Oncology Care Model.

Appendix Exhibit I.4: PY2 State-Level: Descriptive Characteristics of VTAPM and Weighted Comparison Beneficiaries

	Baseline Period						Performance Period	
	BY3		BY2		BY1		PY2	
	VTAPM	Comparison	VTAPM	Comparison	VTAPM	Comparison	VTAPM	Comparison
Number of Beneficiaries	77619	77619	77027	77027	80272	80272	81566	81566
Total Person-Months	918959.3	918959.3	911311.7	911311.8	950197.3	950197.3	966482.2	966482.3
Mean Months of Alignment ± SD	11.8 ± 1.1	11.8 ± 1.1	11.8 ± 1.1	11.8 ± 1.1	11.8 ± 1.1	11.8 ± 1.1	11.8 ± 1.0	11.8 ± 1.0
Mean Age ± SD	71.5 ± 12.9	71.4 ± 12.9	71.6 ± 12.7	71.5 ± 12.8	71.7 ± 12.4	71.6 ± 12.5	72.0 ± 12.0	71.9 ± 12.0
Gender (%)								
Male	43.2	43.2	43.7	43.7	43.9	43.9	44.4	44.4
Race/Ethnicity (%)								
White	96.4	96.4	95.9	95.9	95.4	95.4	94.3	94.3
Black	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Hispanic	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Asian	0.4	0.4	0.5	0.5	0.5	0.5	0.6	0.6
Other	2.1	2.1	2.6	2.6	3.0	3.0	4.1	4.1
Disability/ESRD (%)								
Disability	18.2	18.2	17.8	17.8	17.2	17.2	15.7	15.7
ESRD	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Coverage (%)								
Any Dual Eligibility	33.3	33.0	32.2	32.2	31.5	30.8	28.2	27.6
Any Part D Coverage	76.0	76.0	82.4	82.1	83.3	83.1	84.3	84.1
Chronic Conditions								
Mean No. of Chronic Conditions ± SD	4.1 ± 3.2	4.1 ± 3.3	4.1 ± 3.2	4.1 ± 3.3	4.1 ± 3.3	4.1 ± 3.4	4.4 ± 3.5	4.4 ± 3.5
Alzheimer's/Dementia (%)	5.4	5.4	5.2	5.2	5.2	5.2	5.8	5.8
Chronic Kidney Disease (%)	10.5	10.5	11.1	11.1	12.2	12.2	16.6	16.6
COPD (%)	9.5	9.5	9.5	9.5	9.7	9.7	9.6	9.6
Congestive Heart Failure (%)	8.4	8.4	8.2	8.2	8.2	8.2	8.5	8.5
Diabetes (%)	22.4	22.4	22.1	22.1	21.5	21.5	21.1	21.1
Ischemic Heart Disease (%)	21.2	21.2	21.1	21.1	21.1	21.1	21.6	21.6

	Baseline Period						Performance Period	
	BY3		BY2		BY1		PY2	
	VTAPM	Comparison	VTAPM	Comparison	VTAPM	Comparison	VTAPM	Comparison
Depression (%)	19.0	19.0	19.0	19.0	19.7	19.7	20.2	20.2
RA/OA (%)	26.0	26.0	26.9	26.9	28.0	28.0	30.0	30.0
Stroke/TIA (%)	2.2	2.2	2.1	2.1	2.2	2.2	2.1	2.1
Cancer (%)	7.5	7.4	7.5	7.5	7.4	7.4	7.6	7.6
Mortality (%)								
Death in Reference Period	3.1	3.1	3.2	3.2	3.1	3.1	2.9	2.9
Community Characteristics								
Median Income ($ ± SD)	56,818 ± 14,149	60,385 ± 22,374	57,156 ± 14,249	60,819 ± 23,008	57,075 ± 14,271	60,022 ± 22,112	57,547 ± 14,442	60,689 ± 22,447
Below Poverty Line (% ± SD)	11.7 ± 6.0	11.9 ± 6.1	11.6 ± 6.0	11.8 ± 6.1	11.6 ± 6.0	11.9 ± 6.1	11.5 ± 6.0	11.7 ± 6.1
Bachelor's Degree or Higher (% ± SD)	35.8 ± 13.5	33.3 ± 16.6	36.1 ± 13.5	33.9 ± 16.7	36.0 ± 13.5	33.5 ± 16.4	36.4 ± 13.5	34.0 ± 16.4
Unemployment (% ± SD)	5.0 ± 2.2	6.2 ± 3.7	4.9 ± 2.2	6.2 ± 3.7	5.0 ± 2.2	6.2 ± 3.7	4.9 ± 2.2	6.1 ± 3.7
Uninsured (% ± SD)	5.3 ± 2.3	9.8 ± 5.2	5.2 ± 2.3	9.7 ± 5.2	5.2 ± 2.3	9.8 ± 5.2	5.2 ± 2.3	9.7 ± 5.2
SSI (% ± SD)	6.1 ± 2.9	4.4 ± 2.8	6.1 ± 2.8	4.3 ± 2.8	6.1 ± 2.8	4.3 ± 2.8	6.0 ± 2.8	4.2 ± 2.7
Rurality (%)	75.5	67.9	74.8	68.0	74.9	68.4	74.0	67.1
Alignment-Eligible Providers (per 1,000)	2.5 ± 1.5	1.7 ± 1.5	2.5 ± 1.5	1.7 ± 1.5	2.5 ± 1.5	1.8 ± 1.5	2.6 ± 1.7	1.9 ± 1.6
Participation in Medicare ACOs and Other CMMI Initiatives (%)								
Pioneer/MSSP	73.2	20.3	65.4	25.0	59.3	26.9	0.3	36.1
FAI	0.0	1.6	0.0	2.0	0.0	1.1	0.0	0.5
IAH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CPC	0.0	2.8	0.0	3.3	0.0	3.4	0.2	9.0
BPCI	0.1	0.1	0.2	0.8	0.2	1.2	0.0	1.4
CJR	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.2
OCM	0.0	0.0	0.0	0.0	0.0	0.3	0.0	0.4

NOTE: SD=standard deviation; ESRD=end-stage renal disease; COPD=chronic obstructive pulmonary disease; RA=rheumatoid arthritis; OA=osteoarthritis; TIA=transient ischemic attack; SSI=supplemental security income; MSSP=Medicare Shared Savings Program; FAI=Financial Alignment Initiative; IAH=Independence at Home; CPC=Comprehensive Primary Care (including CPC Plus); BPCI=Bundled Payments for Care Improvement; CJR=Comprehensive Care for Joint Replacement; OCM=Oncology Care Model.

Appendix Exhibit I.5: PY1 ACO-Level: Unadjusted Outcomes for VTAPM and Weighted Comparison Beneficiaries

		BY3		BY2		BY1		PY0		PY1	
		Mean	Std. Error	Mean	Std. Error	Mean	Std. Error	Mean	Std. Error	Mean	Std. Error
Spending ($ PBPY)											
Total Medicare spending (Parts A & B)	**VT**	9762.11	19861.78	10119.13	20722.74	10108.99	21080.58	9899.04	20649.62	10066.05	21584.80
	Comp	10164.20	20724.98	10181.74	20369.84	10031.17	20855.83	9893.72	20862.99	10079.52	20704.05
Utilization (per 1,000 BPY)											
Acute care stays	**VT**	231.63	667.78	243.12	704.24	248.04	699.80	242.27	693.36	238.22	679.90
	Comp	252.17	697.85	257.47	718.67	247.56	677.83	237.58	666.11	240.91	694.04
Acute care days	**VT**	1141.89	4726.90	1165.41	4789.06	1180.02	4796.37	1101.69	4471.71	1149.82	4812.58
	Comp	1128.40	4037.10	1088.31	3898.05	1070.50	4038.11	1063.65	4438.22	1033.27	4126.53
ED visits and observation stays	**VT**	589.70	1500.01	596.55	1454.11	590.16	1511.58	569.38	1365.51	593.48	1551.81
	Comp	585.03	1492.42	577.53	1475.60	580.92	1470.89	583.81	1439.96	550.78	1594.96
E&M visits	**VT**	14793.67	13087.92	15148.07	13619.53	15508.80	13680.93	15371.91	13465.40	15462.71	13499.09
	Comp	12523.32	11451.46	12608.53	11095.28	12875.63	11175.85	12742.24	11260.73	12992.31	11654.33
Primary E&M visits	**VT**	8486.10	8103.37	7887.39	7949.11	7973.98	8111.25	7917.31	8047.42	7732.26	7984.92
	Comp	6373.74	6966.53	6194.02	6622.85	6306.89	6558.81	6380.87	6785.74	6391.36	6838.33
Specialty E&M visits	**VT**	6307.58	7900.76	7260.68	8586.88	7534.82	8436.09	7454.60	8241.95	7730.45	8331.92
	Comp	6149.58	7402.55	6414.51	7339.14	6568.74	7314.90	6361.37	7128.68	6600.96	7434.80
SNF stays	**VT**	56.11	291.92	57.77	299.27	57.52	304.79	56.24	299.28	54.90	297.30
	Comp	63.14	317.45	62.33	305.00	57.82	301.02	51.70	287.06	53.43	312.12
SNF days	**VT**	1507.87	9242.83	1482.09	8949.94	1447.88	8866.80	1382.46	8552.20	1361.85	8685.50
	Comp	1567.04	9235.61	1486.64	8884.39	1382.25	8516.08	1162.01	7689.75	1197.54	7814.67
HH visits	**VT**	2682.51	14236.00	2712.89	13933.32	2762.76	14668.40	2778.55	14820.34	2620.50	13771.97
	Comp	1791.66	9529.65	1650.82	8711.63	1653.97	9062.55	1596.10	9016.26	1668.94	9039.28

		BY3		BY2		BY1		PY0		PY1	
		Mean	Std. Error	Mean	Std. Error	Mean	Std. Error	Mean	Std. Error	Mean	Std. Error
HH episodes	**VT**	122.94	395.82	124.68	395.91	127.94	404.64	123.79	394.85	125.89	402.42
	Comp	91.88	348.95	86.58	332.00	85.57	337.11	80.19	328.39	83.19	335.39
Hospice days	**VT**	877.15	12040.38	898.02	11570.22	975.35	12329.52	1127.91	13373.42	1115.96	13064.19
	Comp	1118.88	13049.28	1082.65	13387.61	1264.78	14251.34	1000.38	11718.88	1116.07	13321.82
Imaging, procedures, and tests	**VT**	32476.95	38674.86	32154.59	37332.46	31762.76	36075.45	31289.18	35578.78	31749.66	36438.05
	Comp	35203.80	38603.72	35514.18	38800.01	34794.92	37231.48	35156.50	37452.50	35183.88	37685.98
Quality of Care (per 1,000 BPY)											
AWV	**VT**	258.64	437.90	306.58	461.08	343.84	474.99	358.51	479.57	375.11	484.16
	Comp	202.81	402.09	218.23	413.05	234.12	423.45	300.10	458.30	341.13	474.09
ACS hospitalizations	**VT**	35.49	185.01	32.09	176.24	33.14	179.00	33.46	179.85	31.61	174.96
	Comp	33.28	179.37	34.81	183.30	33.26	179.32	31.30	174.12	31.92	175.79
Unplanned 30-day readmissions	**VT**	135.34	342.12	134.77	341.51	140.09	347.11	136.05	342.87	131.17	337.61
	Comp	129.65	335.92	127.23	333.23	123.21	328.69	120.89	326.01	122.70	328.10

NOTE: PBPY=per beneficiary per year; BPY=beneficiary per year.

Appendix Exhibit I.6: PY1 State-Level: Unadjusted Outcomes for VTAPM and Weighted Comparison Beneficiaries

		BY3		BY2		BY1		PY0		PY1	
		Mean	Std. Error	Mean	Std. Error	Mean	Std. Error	Mean	Std. Error	Mean	Std. Error
Spending ($ PBPY)											
Total Medicare spending (Parts A & B)	**VT**	9800.235	20685.39	10290.67	21240.06	10189.5	21103.34	10134.25	21305.55	10401.23	22501.27
	Comp	10122.38	21487.15	10475.09	26249.6	10120.17	21203.7	10299.57	22504.21	10378.36	22058.78
Utilization (per 1,000 BPY)											
Acute care stays	**VT**	235.93	672.32	251.20	708.11	248.64	693.24	247.95	695.55	249.89	704.61
	Comp	256.31	699.45	257.62	709.95	249.35	684.39	251.83	695.36	242.49	686.18
Acute care days	**VT**	1138.14	4679.33	1199.10	4779.62	1191.95	4923.47	1147.84	4770.70	1208.67	5089.83
	Comp	1174.18	4373.73	1175.75	4405.45	1111.28	4219.26	1134.42	4466.30	1083.40	4217.48
ED visits and observation stays	**VT**	605.39	1577.77	617.91	1630.95	604.91	1549.47	589.18	1407.38	597.35	1499.72
	Comp	577.58	1536.73	589.93	1619.15	583.32	1455.29	584.01	1502.82	567.98	1501.49
E&M visits	**VT**	13965.32	12901.13	14562.93	13358.44	14714.77	13336.92	14654.53	13141.67	14701.79	13145.13
	Comp	12662.09	11739.71	12941.00	11715.18	13103.04	11816.65	12931.57	11711.24	13040.90	11840.90
Primary E&M visits	**VT**	7623.20	7675.20	7251.37	7500.06	7157.37	7399.72	7128.63	7367.42	7028.23	7378.35
	Comp	6664.47	7359.17	6566.46	7124.52	6694.71	7290.24	6685.14	7223.35	6687.19	7250.45
Specialty E&M visits	**VT**	6342.12	8059.68	7311.57	8733.20	7557.40	8785.67	7525.90	8585.29	7673.56	8567.25
	Comp	5997.62	7368.74	6374.54	7394.59	6408.33	7364.27	6246.42	7243.73	6353.71	7330.16
SNF stays	**VT**	59.30	308.73	61.73	309.15	58.81	302.50	58.76	309.26	58.62	311.30
	Comp	62.38	315.36	61.81	317.71	58.09	308.00	56.47	300.71	53.86	293.68
SNF days	**VT**	1522.55	9295.17	1525.30	9028.34	1440.73	8792.55	1371.95	8479.93	1403.94	8754.91
	Comp	1542.13	9205.62	1466.92	8865.29	1353.01	8400.77	1302.08	8276.70	1244.73	7994.93
HH visits	**VT**	2580.99	14204.12	2760.10	14380.86	2669.32	14211.91	2756.54	14670.16	2746.43	14591.90
	Comp	1898.55	10203.73	1950.03	10598.46	1904.67	10358.36	1856.77	10004.67	1880.54	10238.39
HH episodes	**VT**	119.20	393.97	124.98	400.87	126.11	403.15	124.98	398.78	125.36	400.56
	Comp	91.97	346.82	91.91	346.38	89.73	342.91	90.63	349.22	89.38	341.68
Hospice days	**VT**	827.32	11197.16	962.07	12413.31	1082.20	13223.14	1204.03	14270.62	1240.64	14798.39
	Comp	1057.51	13134.18	1115.64	13484.24	1152.33	13837.22	1176.81	13893.72	1117.02	13367.24
Imaging, procedures, and tests	**VT**	31822.30	37127.12	31806.41	36851.72	31347.56	35229.08	31223.17	35081.84	31560.99	35771.78
	Comp	35005.99	38304.13	35765.24	39647.07	35081.75	38023.28	35158.63	38712.95	35307.29	38635.36

		BY3		BY2		BY1		PY0		PY1	
		Mean	Std. Error	Mean	Std. Error	Mean	Std. Error	Mean	Std. Error	Mean	Std. Error
Quality of Care (per 1,000 BPY)											
AWV	**VT**	214.60	410.55	242.52	428.61	254.90	435.80	271.53	444.75	295.08	456.08
	Comp	196.95	397.70	224.85	417.48	250.36	433.22	291.96	454.67	323.84	467.94
ACS hospitalizations	**VT**	37.23	189.33	34.61	182.79	34.03	181.32	35.14	184.14	34.60	182.77
	Comp	36.65	187.89	36.27	186.97	33.08	178.86	33.48	179.88	32.92	178.42
Unplanned 30-day readmissions	**VT**	133.38	339.99	134.23	340.92	136.79	343.64	129.56	335.83	133.56	340.19
	Comp	132.87	339.44	129.91	336.20	120.95	326.07	125.20	330.95	122.71	328.10

NOTE: PBPY=per beneficiary per year; BPY=beneficiary per year.

Appendix Exhibit I.7: PY2 ACO-Level: Unadjusted Outcomes for VTAPM and Weighted Comparison Beneficiaries

		BY3		BY2		BY1		PY0		PY1		PY2	
		Mean	Std. Error	Mean	Std. Error	Mean	Std. Error	Mean	Std. Error	Mean	Std. Error	Mean	Std. Error
Spending ($ PBPY)													
Total Medicare spending (Parts A and B)	**VT**	9809.46	20144.19	10179.22	21118.50	10007.38	20871.71	9907.36	20863.10	10050.34	21461.93	9926.36	21547.37
	Comp	10172.05	20790.23	10218.99	20946.18	10041.78	20685.70	9815.49	20904.61	10284.85	22355.97	10441.57	21692.49
Utilization (per 1,000 BPY)													
Acute care stays	**VT**	234.66	674.69	244.70	698.98	241.41	684.48	239.41	682.88	237.05	674.25	234.81	692.49
	Comp	266.90	721.05	261.89	738.24	246.75	684.09	245.59	695.01	245.78	711.55	243.36	698.33
Acute care days	**VT**	1146.27	4731.70	1182.66	4894.83	1149.84	4812.76	1106.37	4566.60	1159.88	4950.34	1157.15	5082.02
	Comp	1227.38	4284.48	1184.11	4329.88	1105.40	4187.87	1134.23	4598.66	1087.81	4230.74	1069.92	4079.25
ED visits and observation stays	**VT**	608.86	1571.72	607.97	1520.45	598.35	1521.97	581.29	1417.77	594.09	1559.29	582.17	1496.61
	Comp	593.62	1501.06	576.01	1476.29	579.83	1440.10	571.65	1392.17	535.70	1449.43	541.80	1350.89
E&M visits	**VT**	14710.03	13220.61	15074.33	13699.74	15365.60	13701.01	15156.59	13409.07	15213.84	13429.89	14919.38	13197.68
	Comp	12940.36	11955.79	13121.85	11694.02	13492.29	12017.08	13094.25	11821.61	13386.65	12272.21	13054.19	11913.29
Primary E&M visits	**VT**	8242.67	8017.29	7677.04	7823.57	7675.22	7850.18	7549.43	7753.43	7390.11	7769.37	7249.44	7598.24
	Comp	6472.98	7163.66	6303.61	6827.80	6492.97	6924.85	6472.83	7045.38	6524.21	7184.48	6451.49	6955.29
Specialty E&M visits	**VT**	6467.37	8142.44	7397.29	8769.99	7690.38	8705.67	7607.16	8458.96	7823.73	8468.67	7669.93	8298.36
	Comp	6467.38	7849.97	6818.24	7624.96	6999.32	7894.28	6621.41	7517.76	6862.44	7830.73	6602.70	7604.29
SNF stays	**VT**	59.35	308.46	59.97	304.55	57.91	301.24	58.20	307.79	57.43	307.08	55.80	306.26
	Comp	64.71	328.74	61.22	306.04	58.21	305.02	53.09	293.74	54.81	311.93	50.99	304.96
SNF days	**VT**	1530.03	9324.53	1499.93	8956.37	1436.03	8759.40	1397.90	8594.45	1390.91	8706.68	1299.02	8157.64
	Comp	1614.31	9500.67	1480.75	8767.32	1347.42	8255.04	1149.86	7591.73	1233.51	7993.25	1217.99	8177.74
Home health visits	**VT**	2626.61	14145.07	2715.40	14030.48	2706.51	14593.91	2732.02	14661.89	2616.33	14044.64	2400.42	13090.31
	Comp	2102.78	10433.97	1953.23	10036.02	1912.02	9823.61	1950.15	10501.01	1888.03	9772.96	1882.01	10114.13
Home health episodes	**VT**	123.92	399.19	125.57	399.68	126.01	402.73	123.62	395.23	125.76	401.01	121.60	399.05
	Comp	104.26	369.27	100.11	359.29	96.43	356.02	93.76	354.33	94.12	355.44	89.09	345.44
Hospice days	**VT**	873.39	11909.83	960.34	12317.68	1017.29	12578.60	1141.02	13585.78	1172.04	13627.53	1137.77	13769.30
	Comp	1021.15	11945.71	974.30	12052.36	1182.09	13577.92	1015.11	12399.92	973.34	11987.39	1018.03	12567.60

		BY3		BY2		BY1		PY0		PY1		PY2	
		Mean	Std. Error	Mean	Std. Error	Mean	Std. Error	Mean	Std. Error	Mean	Std. Error	Mean	Std. Error
Imaging, procedures, and tests	**VT**	32556.87	38217.94	32054.72	36705.13	31798.87	35795.50	31501.95	35441.15	31845.65	36031.82	32068.97	36580.91
	Comp	35015.15	38022.83	35407.31	38864.07	35342.62	37647.89	35250.44	37487.02	35341.15	37998.84	36377.39	39182.00
Quality of Care (per 1,000 BPY)													
Annual wellness visit	**VT**	259.75	438.50	296.20	456.59	318.33	465.83	338.15	473.08	349.98	476.97	372.08	483.36
	Comp	217.62	412.63	246.82	431.16	274.53	446.28	344.41	475.17	386.37	486.92	430.64	495.17
ACS hospitalizations	**VT**	37.18	189.21	32.64	177.69	30.76	172.66	31.32	174.18	29.67	169.68	29.60	169.49
	Comp	36.56	187.69	35.98	186.24	30.20	171.13	29.53	169.29	29.50	169.20	28.63	166.78
Unplanned 30-day readmissions	**VT**	131.73	338.23	133.33	339.96	136.07	342.89	132.74	339.31	133.93	340.60	137.51	344.41
	Comp	136.38	343.20	127.70	333.76	131.07	337.48	123.23	328.70	134.60	341.30	131.80	338.28

NOTE: PBPY=per beneficiary per year; BPY=beneficiary per year.

Appendix Exhibit I.8: PY1 State-Level: Unadjusted Outcomes for VTAPM and Weighted Comparison Beneficiaries

		BY3		BY2		BY1		PY0		PY1		PY2	
		Mean	Std. Error	Mean	Std. Error	Mean	Std. Error	Mean	Std. Error	Mean	Std. Error	Mean	Std. Error
Spending ($ PBPY)													
Total Medicare spending (Part A and B)	**VT**	9759.14	20599.21	10251.98	21131.63	10156.86	21043.58	10092.99	21211.96	10353.30	22348.30	10198.73	21783.88
	Comp	10122.09	21485.72	10469.30	26193.70	10120.17	21215.96	10299.11	22502.31	10373.37	22049.74	10710.70	23567.43
Utilization (per 1,000 BPY)													
Acute care stays	**VT**	235.14	669.76	250.18	704.54	247.85	690.52	246.99	692.30	248.42	695.18	242.90	698.24
	Comp	256.34	699.41	257.34	708.80	249.25	684.55	251.98	695.64	242.50	686.11	237.09	676.57
Acute care days	**VT**	1135.69	4675.24	1194.49	4758.24	1189.09	4916.25	1142.89	4726.59	1201.29	5028.02	1183.95	5038.71
	Comp	1172.73	4354.38	1174.86	4404.27	1111.30	4222.04	1134.51	4463.94	1082.66	4211.30	1059.26	4198.59
ED visits and observation stays	**VT**	605.39	1577.77	617.91	1630.95	604.91	1549.47	589.18	1407.38	597.35	1499.72	591.23	1553.61
	Comp	577.94	1536.65	589.92	1616.22	583.38	1457.17	584.29	1505.01	567.49	1498.09	561.36	1577.83
E&M visits	**VT**	13965.32	12901.13	14562.93	13358.44	14714.77	13336.92	14654.53	13141.67	14701.79	13145.13	14481.32	13013.46
	Comp	12658.32	11735.10	12936.30	11710.86	13096.97	11801.94	12931.55	11717.41	13035.50	11838.46	12851.32	11750.15
Primary E&M visits	**VT**	7623.20	7675.20	7251.37	7500.06	7157.37	7399.72	7128.63	7367.42	7028.23	7378.35	6917.13	7329.02
	Comp	6661.99	7356.06	6564.96	7121.64	6696.04	7292.33	6687.61	7229.89	6685.98	7249.54	6697.50	7284.91
Specialty E&M visits	**VT**	6342.12	8059.68	7311.57	8733.20	7557.40	8785.67	7525.90	8585.29	7673.56	8567.25	7564.18	8435.44
	Comp	5996.33	7367.57	6371.34	7394.07	6400.93	7341.56	6243.93	7245.61	6349.51	7328.32	6153.82	7184.74
SNF stays	**VT**	59.30	308.73	61.73	309.15	58.81	302.50	58.76	309.26	58.86	311.85	55.12	303.64
	Comp	62.41	315.49	61.76	317.60	58.08	308.00	56.46	300.83	53.99	294.18	52.09	290.32
SNF days	**VT**	1522.55	9295.17	1525.30	9028.34	1440.73	8792.55	1371.95	8479.93	1406.26	8761.65	1282.15	8170.40
	Comp	1545.07	9219.86	1467.43	8871.57	1353.65	8407.91	1303.31	8286.82	1247.32	8006.88	1199.17	7857.42
HH visits	**VT**	2580.99	14204.12	2760.10	14380.86	2669.32	14211.91	2756.54	14670.16	2746.43	14591.90	2571.28	13691.09
	Comp	1904.14	10223.11	1954.80	10614.51	1908.03	10366.64	1859.36	10010.72	1886.57	10259.11	1779.78	9745.58
HH episodes	**VT**	119.20	393.97	124.98	400.87	126.11	403.15	124.98	398.78	125.36	400.56	121.93	397.11
	Comp	92.06	346.98	91.97	346.59	89.82	343.02	90.68	349.39	89.48	341.84	86.14	338.10
Hospice days	**VT**	827.32	11197.16	962.07	12413.31	1081.83	13221.98	1194.82	14066.41	1230.85	14591.38	1223.94	14759.74
	Comp	1059.05	13150.58	1117.46	13493.88	1152.07	13820.34	1178.11	13880.20	1118.08	13374.16	1278.20	14724.79

		BY3		BY2		BY1		PY0		PY1		PY2	
		Mean	Std. Error	Mean	Std. Error	Mean	Std. Error	Mean	Std. Error	Mean	Std. Error	Mean	Std. Error
Imaging, procedures, and tests	**VT**	31822.30	37127.12	31806.41	36851.72	31347.56	35229.08	31223.17	35081.84	31560.99	35771.78	31856.50	36061.83
	Comp	35016.80	38314.32	35768.18	39653.03	35080.97	38032.85	35163.63	38728.76	35305.40	38630.22	36132.11	39803.74
Quality of Care (per 1,000 BPY)													
AWV	**VT**	214.60	410.55	242.52	428.61	254.90	435.80	271.53	444.75	295.08	456.08	315.71	464.80
	Comp	196.77	397.56	224.68	417.37	250.19	433.12	291.70	454.54	323.67	467.87	353.51	478.06
ACS hospitalizations	**VT**	37.23	189.33	34.07	181.40	31.36	174.28	32.59	177.57	31.79	175.44	30.65	172.37
	Comp	36.68	187.98	35.45	184.92	29.55	169.35	29.92	170.37	29.67	169.68	27.42	163.31
Unplanned 30-day readmissions	**VT**	133.38	339.99	134.23	340.92	136.79	343.64	129.56	335.83	133.54	340.17	135.95	342.75
	Comp	133.07	339.65	129.77	336.05	120.86	325.96	125.32	331.08	122.86	328.27	124.56	330.21

NOTE: PBPY=per beneficiary per year; BPY=beneficiary per year.

Appendix Exhibit I.9: PY1 ACO-Level: Common Baseline Trend Metrics for VTAPM and Weighted Comparison Beneficiaries

	BY3 vs. BY2			BY3 vs. BY1			Linear Interaction Term		
	Effect	**Std. Error**	**p**	**Effect**	**Std. Error**	**p**	**Effect**	**Std. Error**	**p**
Spending ($ PBPY)									
Total Medicare spending (Parts A and B)	737.937	347.271	0.034	395.907	350.324	0.258	190.008	177.956	0.286
Utilization (per 1,000 BPY)									
Acute care stays	9.677	10.141	0.340	18.712	9.110	0.040	9.572	4.553	0.036
Acute care days	95.646	75.021	0.202	103.185	63.254	0.103	49.071	30.314	0.106
ED visits and observation stays	19.656	23.663	0.406	22.346	24.262	0.357	11.260	11.821	0.341
E&M visits	178.341	228.474	0.435	-35.120	122.404	0.774	-42.590	65.753	0.517
Primary E&M visits	-305.121	160.273	0.057	-479.322	140.773	0.001	-230.455	65.565	0.000
Specialty E&M visits	812.549	174.286	0.000	744.537	115.144	0.000	312.286	61.146	0.000
SNF stays	3.525	4.116	0.392	4.455	3.581	0.213	2.131	1.700	0.210
SNF days	79.066	125.172	0.528	103.614	101.782	0.309	35.021	47.342	0.459
HH visits	211.601	190.654	0.267	289.186	170.933	0.091	143.408	84.889	0.091
HH episodes	7.692	4.212	0.068	11.030	4.842	0.023	5.287	2.408	0.028
Hospice days	18.580	128.312	0.885	338.929	174.427	0.052	9.966	76.252	0.896
Imaging, procedures, and tests	-211.323	871.116	0.808	-518.647	541.446	0.338	-331.324	253.995	0.192
Quality of Care (per 1,000 BPY)									
AWV	11.974	12.231	0.328	21.571	36.304	0.552	19.354	18.271	0.289
ACS hospitalizations	-5.351	2.927	0.068	-3.186	2.404	0.185	-1.641	1.080	0.129
Unplanned 30-day readmissions	3.030	8.376	0.718	9.010	6.666	0.176	4.508	3.334	0.176

NOTE: PBPY=per beneficiary per year; BPY=beneficiary per year. Asterisks denote significance at *p<0.10, **p<0.05, ***p<0.01. Difference columns indicate whether the average adjusted outcome increased or decreased from the BY to PY1. † indicates that the coefficient for the linear interaction term was significant, which indicates diverging trends in the baseline period between the VTAPM and comparison groups.

Appendix Exhibit I.10: PY1 State-Level: Common Baseline Trend Metrics for VTAPM and Weighted Comparison Beneficiaries

	BY3 vs. BY2			BY3 vs. BY1			Linear Interaction Term		
	Effect	Std. Error	p	Effect	Std. Error	p	Effect	Std. Error	p
Spending ($ PBPY)									
Total Medicare spending (Parts A and B)	308.987	121.016	0.011	302.234	144.886	0.037	154.965	73.399	0.035
Utilization (per 1,000 BPY)									
Acute care stays	16.296	3.001	0.000	20.219	3.236	0.000	10.292	1.623	0.000
Acute care days	88.756	21.481	0.000	110.509	20.099	0.000	53.563	9.821	0.000
ED visits and observation stays	2.386	7.404	0.747	-4.759	8.232	0.563	-2.404	4.128	0.560
E&M visits	357.280	107.491	0.001	368.028	112.558	0.001	158.814	62.241	0.011
Primary E&M visits	-85.004	208.554	0.684	-311.153	175.073	0.076	-144.421	87.647	0.099
Specialty E&M visits	527.517	121.375	0.000	724.936	90.801	0.000	329.448	44.487	0.000
SNF stays	4.033	1.325	0.002	4.083	1.498	0.006	2.022	0.741	0.006
SNF days	77.294	71.588	0.280	111.747	63.031	0.076	53.240	29.844	0.074
HH visits	253.131	100.968	0.012	70.912	73.078	0.332	28.518	36.038	0.429
HH episodes	7.533	1.950	0.000	10.283	2.347	0.000	4.378	1.111	0.000
Hospice days	128.603	47.192	0.006	140.041	62.684	0.025	86.385	31.562	0.006
Imaging, procedures, and tests	-1001.703	457.489	0.029	-870.057	501.357	0.083	-436.657	242.383	0.072
Quality of Care (per 1,000 BPY)									
AWV	1.427	8.283	0.863	-10.263	8.028	0.201	-6.350	3.542	0.073
ACS hospitalizations	-1.803	0.553	0.001	0.329	0.543	0.545	0.095	0.250	0.705
Unplanned 30-day readmissions	5.736	3.381	0.090	14.974	3.606	0.000	7.498	1.803	0.000

NOTE: PBPY=per beneficiary per year; BPY=beneficiary per year.

Appendix Exhibit I.11: PY2 ACO-Level: Common Baseline Trend Metrics for VTAPM and Weighted Comparison Beneficiaries

	BY3 vs. BY2			BY3 vs. BY1			Linear Interaction Term		
	Effect	**Std. Error**	**p**	**Effect**	**Std. Error**	**p**	**Effect**	**Std. Error**	**p**
Spending ($ PBPY)									
Total Medicare spending (Parts A and B)	382.987	185.287	0.039	276.156	150.303	0.066	129.578	81.550	0.112
Utilization (per 1,000 BPY)									
Acute care stays	15.682	7.071	0.027	29.792	7.261	0.000	14.716	3.720	0.000
Acute care days	78.862	45.654	0.084	126.760	39.708	0.001	63.113	20.084	0.002
ED visits and observation stays	3.357	14.821	0.821	-9.501	12.181	0.435	-3.876	5.825	0.506
E&M visits	-98.627	171.222	0.565	-321.623	122.008	0.008	-153.956	61.588	0.012
Primary E&M visits	-285.002	204.484	0.163	-599.455	161.885	0.000	-296.907	64.497	0.000
Specialty E&M visits	596.304	129.327	0.000	758.488	111.737	0.000	296.082	65.117	0.000
SNF stays	3.457	2.894	0.232	3.200	2.333	0.170	1.622	1.144	0.156
SNF days	100.537	103.497	0.331	106.907	74.176	0.150	66.820	35.723	0.061
HH visits	341.085	195.125	0.080	469.335	174.313	0.007	230.338	78.050	0.003
HH episodes	5.729	2.601	0.028	12.362	4.022	0.002	6.211	1.993	0.002
Hospice days	537.051	105.643	0.000	751.444	159.715	0.000	58.091	73.106	0.427
Imaging, procedures, and tests	-812.063	341.769	0.017	-1042.839	436.629	0.017	-528.995	209.261	0.011
Quality of Care (per 1,000 BPY)									
AWV	-7.702	13.783	0.576	-17.003	23.015	0.460	-0.218	11.322	0.985
ACS hospitalizations	-3.770	2.225	0.090	0.539	1.855	0.771	0.322	0.707	0.649
Unplanned 30-day readmissions	9.842	4.564	0.031	9.373	6.478	0.148	4.504	2.928	0.124

NOTE: PBPY=per beneficiary per year; BPY=beneficiary per year.

Appendix Exhibit I.12: PY2 State-Level: Common Baseline Trend Metrics for VTAPM and Weighted Comparison Beneficiaries

	BY3 vs. BY2			BY3 vs. BY1			Linear Interaction Term		
	Effect	Std. Error	p	Effect	Std. Error	p	Effect	Std. Error	p
Spending ($ PBPY)									
Total Medicare spending (Parts A and B)	327.158	124.266	0.008	327.411	149.501	0.029	170.371	74.382	0.022
Utilization (per 1,000 BPY)									
Acute care stays	16.417	3.138	0.000	20.515	3.296	0.000	10.313	1.618	0.000
Acute care days	88.613	21.564	0.000	112.701	19.843	0.000	54.244	9.970	0.000
ED visits and observation stays	1.272	9.852	0.897	-4.793	10.010	0.632	-2.715	5.144	0.598
E&M visits	298.321	99.684	0.003	301.476	102.066	0.003	126.355	56.892	0.026
Primary E&M visits	-157.851	133.921	0.239	-349.553	114.623	0.002	-161.327	60.791	0.008
Specialty E&M visits	514.972	122.937	0.000	704.424	95.315	0.000	326.526	48.410	0.000
SNF stays	4.097	1.344	0.002	4.425	1.494	0.003	2.114	0.723	0.003
SNF days	80.642	78.159	0.302	108.819	68.264	0.111	51.151	32.528	0.116
HH visits	236.204	103.764	0.023	49.507	74.592	0.507	25.543	36.516	0.484
HH episodes	7.754	2.042	0.000	10.442	2.470	0.000	4.421	1.138	0.000
Hospice days	86.799	33.818	0.010	181.880	54.701	0.001	112.832	30.202	0.000
Imaging, procedures, and tests	-850.253	209.637	0.000	-721.472	321.254	0.025	-373.135	157.382	0.018
Quality of Care (per 1,000 BPY)									
AWV	1.016	8.237	0.902	-10.638	8.002	0.184	-6.554	3.566	0.066
ACS hospitalizations	-1.460	0.540	0.007	1.265	0.599	0.035	0.571	0.257	0.026
Unplanned 30-day readmissions	6.145	3.353	0.067	16.060	3.733	0.000	7.960	1.878	0.000

NOTE: PBPY=per beneficiary per year; BPY=beneficiary per year. Asterisks denote significance at *p<0.10, **p<0.05, ***p<0.01. Difference columns indicate whether the average adjusted outcome increased or decreased from the BY to PY1. † indicates that the coefficient for the linear interaction term was significant, which indicates diverging trends in the baseline period between the VTAPM and comparison groups.

Appendix Exhibit I.13: PY1 ACO-Level: Impact of VTAPM on Spending, Utilization, and Quality of Care

	Base Years (2014-2016)		Performance Year (2018)							
					Difference-in-Differences					
	VTAPM	Comp.	VTAPM	Comp.	DID Estimate	VTAPM Change	Comp. Change	90% CI	% Impact	p
Spending ($ PBPY)										
Total Medicare spending (Parts A and B)	10332	10793	9862	10683	-360.11	▼	▼	-1343.33, 623.12	-3.39	0.547
Utilization (per 1,000 BPY)										
Acute care stays	263	297	239	295	-20.91 †	▼	▼	-45.30, 3.47	-8.04	0.158
Acute care days	1179	1482	1087	1425	-35.13	▼	▼	-181.89, 111.62	-3.13	0.694
ED visits and observation stays	564	648	567	627	23.91	△	▼	-62.79, 110.61	4.401	0.650
E&M visits	14545	13234	14712	13530	-130.13	△	△	-570.48, 310.21	-0.90	0.627
Primary E&M visits	7599	6862	7493	6714	41.39 †	▼	▼	-208.49, 291.28	0.62	0.785
Specialty E&M visits	6923	6613	6476	7023	-857.16* †	▼	△	-1664.25, -50.07	-10.1	0.081
SNF stays	51	70	45	65	-0.87	▼	▼	-8.11, 6.38	-1.90	0.844
SNF days	1258	1693	1042	1499	-21.20	▼	▼	-205.69, 163.29	-1.99	0.850
HH visits	3816	2979	3210	3098	-724.60	▼	△	-1465.14, 15.94	-18.4	0.108
HH episodes	121	112	108	109	-10.33 †	▼	▼	-24.87, 4.21	-8.70	0.242
Hospice days	2481	1033	2651	1126	76.79	△	△	-1039.15, 1192.72	2.983	0.910
Imaging, procedures, and tests	31930	36638	32046	36248	506.13	△	▼	-308.84, 1321.10	1.69	0.307
Quality of Care (per 1,000 BPY)										
AWV	203	371	171	470	-131.04***	▼	△	-183.73, -78.34	-43.3	0.000
ACS hospitalizations	32	35	34	33	3.46	△	▼	-1.97, 8.90	11.50	0.295
Unplanned 30-day readmissions	130	134	110	129	-15.18	▼	▼	-40.42, 10.07	-12.1	0.323

NOTE: PBPY=per beneficiary per year; BPY=beneficiary per year. Asterisks denote significance at *p<0.10, **p<0.05, ***p<0.01. Difference columns indicate whether the average adjusted outcome increased or decreased from the BY to PY1. † indicates that the coefficient for the linear interaction term was significant, which indicates diverging trends in the baseline period between the VTAPM and comparison groups.

Appendix Exhibit I.14: PY1 State-Level: Impact of VTAPM on Spending, Utilization, and Quality of Care

	Base Years (2014-2016)		Performance Year (2018)							
					Difference-in-Differences					
	VTAPM	Comp.	VTAPM	Comp.	DID Estimate	VTAPM Change	Comp. Change	90% CI	% Impact	p
Spending ($ PBPY)										
Total Medicare spending (Parts A and B)	10810	11258	10780	11610	-382.66 †	▼	△	-858.90, 93.57	-3.39	0.186
Utilization (per 1,000 BPY)										
Acute care stays	272	304	256	299	-10.94* †	▼	▼	-21.36, -0.53	-4.09	0.084
Acute care days	1405	1488	1306	1429	-39.25 †	▼	▼	-98.23, 19.73	-2.91	0.274
ED visits and observation stays	652	639	666	642	11.06	△	△	-10.09, 32.22	1.690	0.390
E&M visits	14087	13214	13972	13415	-316.86* †	▼	△	-601.28, -32.44	-2.20	0.067
Primary E&M visits	7452	6674	7431	6506	147.82	▼	▼	-109.51, 405.16	2.24	0.345
Specialty E&M visits	6689	6645	6417	6988	-615.82*** †	▼	△	-837.75, -393.90	-7.70	0.000
SNF stays	62	70	57	65	-0.22 †	▼	▼	-4.90, 4.46	-0.38	0.939
SNF days	1714	1838	1485	1621	-11.91	▼	▼	-182.13, 158.32	-0.79	0.908
HH visits	4361	3349	4471	3458	1.37	△	△	-270.83, 273.57	0.031	0.993
HH episodes	146	119	137	120	-10.05* †	▼	△	-19.98, -0.12	-6.83	0.096
Hospice days	991	1265	1105	1296	82.54 †	▲	△	-72.50, 237.57	8.076	0.381
Imaging, procedures, and tests	33211	34822	34404	34703	1311.53***	△	▼	559.07, 2064.00	4.29	0.004
Quality of Care (per 1,000 BPY)										
AWV	244	219	299	295	-21.07	△	△	-45.78, 3.64	-6.58	0.161
ACS hospitalizations	34	36	34	35	1.37	▼	▼	-0.65, 3.38	4.171	0.264
Unplanned 30-day readmissions	125	138	104	136	-17.66*** †	▼	▼	-28.87, -6.46	-14.5	0.010

NOTE: PBPY=per beneficiary per year; BPY=beneficiary per year. Asterisks denote significance at *p<0.10, **p<0.05, ***p<0.01. Difference columns indicate whether the average adjusted outcome increased or decreased from the BY to PY1. † indicates that the coefficient for the linear interaction term was significant, which indicates diverging trends in the baseline period between the VTAPM and comparison groups.

Appendix Exhibit I.15: PY2 ACO-Level: Impact of VTAPM on Spending, Utilization, and Quality of Care

	Base Years (2014-2016)		Performance Year (2018)							
					Difference-in-Differences					
	VTAPM	Comp.	VTAPM	Comp.	DID Estimate	VTAPM Change	Comp. Change	90% CI	% Impact	p
Spending ($ PBPY)										
Total Medicare spending (Parts A and B)	10949	10945	10257	11045	-793.39*	▼	△	-1526.58, -60.20	-6.94	0.075
Utilization (per 1,000 BPY)										
Acute care stays	240	309	189	299	-41.20*** †	▼	▼	-65.59, -16.82	-17.90	0.005
Acute care days	1151	1470	914	1390	-156.94* †	▼	▼	-301.04, -12.85	-14.66	0.073
ED visits and observation stays	663	625	684	615	31.81	△	▼	-4.86, 68.48	4.88	0.154
E&M visits	14311	14257	14851	14144	652.47*** †	△	▼	292.44, 1012.50	5.03	0.003
Primary E&M visits	6666	7624	6935	7371	521.61*** †	△	▼	232.69, 810.53	9.80	0.003
Specialty E&M visits	7362	6825	6745	6856	-648.78** †	▼	△	-1188.42, -109.15	-7.67	0.048
SNF stays	64	68	60	60	3.89	▼	▼	-3.73, 11.52	6.89	0.401
SNF days	1649	1709	1378	1487	-49.35	▼	▼	-309.12, 210.43	-3.46	0.755
HH visits	2962	3540	2028	3287	-681.31* †	▼	▼	-1261.89, -100.72	-25.15	0.054
HH episodes	106	127	85	120	-14.14* †	▼	▼	-26.96, -1.33	-14.26	0.069
Hospice days	3557	1196	3508	1230	-83.55	▼	△	-2054.39, 1887.29	-2.33	0.944
Imaging, procedures, and tests	32172	35012	33829	35639	1030.44 †	△	△	-44.57, 2105.45	3.45	0.115
Quality of Care (per 1,000 BPY)										
AWV	247	390	226	486	-116.88**	▼	△	-196.92, -36.83	-34.06	0.016
ACS hospitalizations	30	35	28	32	1.24	▼	▼	-4.56, 7.03	4.65	0.726
Unplanned 30-day readmissions	124	140	111	143	-15.80	▼	△	-40.95, 9.36	-12.44	0.302

NOTE: PBPY=per beneficiary per year; BPY=beneficiary per year. Asterisks denote significance at *p<0.10, **p<0.05, ***p<0.01. Difference columns indicate whether the average adjusted outcome increased or decreased from the BY to PY1. † indicates that the coefficient for the linear interaction term was significant, which indicates diverging trends in the baseline period between the VTAPM and comparison groups.

Appendix Exhibit I.16: PY2 State-Level: Impact of VTAPM on Spending, Utilization, and Quality of Care

	Base Years (2014-2016)		Performance Year (2018)							
					Difference-in-Differences					
	VTAPM	Comp.	VTAPM	Comp.	DID Estimate	VTAPM Change	Comp. Change	90% CI	% Impact	p
Spending ($ PBPY)										
Total Medicare spending (Parts A and B)	10764	11431	9866	11715	-1181.57*** †	▼	△	-1819.02, -544.13	-10.0	0.002
Utilization (per 1,000 BPY)										
Acute care stays	266	301	232	290	-23.84*** †	▼	▼	-36.40, -11.28	-9.32	0.002
Acute care days	1367	1470	1162	1384	-119.52** †	▼	▼	-196.99, -42.06	-9.33	0.011
ED visits and observation stays	654	636	656	621	16.70	△	▼	-17.91, 51.30	2.61	0.427
E&M visits	14292	13381	13960	13412	-362.49 †	▼	△	-732.99, 8.01	-2.52	0.108
Primary E&M visits	7381	6530	7490	6409	230.80 †	△	▼	-14.57, 476.16	3.59	0.122
Specialty E&M visits	6861	6868	6170	7009	-832.94*** †	▼	△	-1158.05, -507.82	-10.20	0.000
SNF stays	60	69	51	63	-3.11 †	▼	▼	-8.23, 2.01	-5.73	0.318
SNF days	1625	1760	1314	1556	-106.97	▼	▼	-329.09, 115.16	-7.53	0.428
HH visits	4276	3317	4266	3248	58.80	▼	▼	-241.61, 359.22	1.40	0.747
HH episodes	145	119	128	115	-13.63** †	▼	▼	-23.35, -3.91	-9.65	0.021
Hospice days	953	1229	712	1386	-397.77** †	▼	△	-654.98, -140.57	-35.83	0.011
Imaging, procedures, and tests	32312	34450	33797	35048	886.55** †	△	△	165.31, 1607.79	2.92	0.043
Quality of Care (per 1,000 BPY)										
AWV	269	246	323	321	-22.51	△	△	-53.80, 8.78	-6.52	0.237
ACS hospitalizations	32	34	29	30	1.11 †	▼	▼	-0.69, 2.92	4.00	0.309
Unplanned 30-day readmissions	123	138	96	138	-27.69*** †	▼	▼	-42.72, -12.66	-22.44	0.002

NOTE: PBPY=per beneficiary per year; BPY=beneficiary per year. Asterisks denote significance at *p<0.10, **p<0.05, ***p<0.01. Difference columns indicate whether the average adjusted outcome increased or decreased from the BY to PY1. † indicates that the coefficient for the linear interaction term was significant, which indicates diverging trends in the baseline period between the VTAPM and comparison groups.

Appendix Exhibit I.17: OneCare, NGACO, and Medicare SSP Quality Performance Measures, 2016-2019

Measure	OneCare				NGACO			Medicare SSP		
	BY1	PY0	PY1	PY2	BY1	PY0	PY1	BY1	PY0	PY1
Health-Care Delivery System Targets										
Getting Timely Care, Appointments, and Information	82.0%	83.3%	84.6%	82.5%	81.2%	81.3%	86.2%	79.9%	80.2%	86.2%
All Condition Readmission	15.1%	15.1%	14.6%	14.9%	14.8%	15.2%	15.2%	14.7%	15.0%	15.0%
All-Cause Unplanned Admissions for Patients with Multiple Chronic Conditions	66.3%	65.9%	63.8%	60.0%	60.7%	62.1%	59.9%	59.8%	61.8%	59.1%
Hemoglobin A1c Poor Control	--	--	16.0%	13.5%	19.5%	15.8%	15.4%	18.2%	16.8%	15.5%
Hypertension: Controlling High Blood Pressure	68.5%	69.8%	68.1%	71.5%	74.0%	73.6%	74.6%	70.5%	71.7%	73.1%
Follow Up after ED Visit for Mental Illness within 30 Days	--	--	--	53.6%	--	--	--	--	--	--
Follow Up after ED Visit for Alcohol and Other Drug Abuse or Dependence within 30 Days	--	--	--	19.9%	--	--	--	--	--	--
Preventive Care & Screening										
Influenza Immunization	76.9%	79.0%	70.2%	72.4%	72.7%	74.0%	71.4%	68.3%	72.5%	72.7%
Tobacco Use: Screening and Cessation Intervention	97.5%	97.7%	81.8%	94.0%	93.0%	89.9%	70.6%	91.0%	90.5%	72.8%
Screening for Clinical Depression and Follow-up Plan	47.0%	50.2%	57.6%	60.0%	56.9%	59.3%	66.1%	53.6%	62.0%	66.6%

SOURCE: 2019 ACO Quality Performance Report.