MEMO

Date: March 14, 2024

To:

Minnesota Department of Health

Fr:

University of Minnesota, School of Public Health, State Health Access Data Assistance Center (SHADAC)

Cc:

University of Minnesota, School of Public Health, SHADAC

Re: Final Memo Summarizing Critical Review of Single-Payer Studies

The University of Minnesota's State Health Access Data Assistance Center (UMN-SHADAC) research team conducted a review of six state and federal studies of single-payer proposals selected by the Minnesota Department of Health (MDH) team. This memo serves as a summary of our data extraction and review of study characteristics. This summary focuses on how the characteristics of the models reviewed align with requirements articulated in Minnesota's single-payer legislation.

INTRODUCTION

The State of Minnesota is strongly committed to ensuring that its residents are able to obtain high quality health care that is both affordable and accessible. One proposed policy strategy to accomplish this is through the establishment of a state-based, single-payer plan. In 2023, SF 2740 and HF 2798 called for the establishment of the Minnesota Health Plan (MHP), designed to:

- Be available to all residents, including those who are out-of-state temporarily
- Cover all medically necessary services with emphasis on prevention and early intervention along with inclusion of long-term care (LTC)
- Ensure that all enrollees have a primary care provider and that no referrals would be required to see a specialist
- Allow patients to choose their doctors, hospitals, and other providers [according to subsequent state legislation (SF 2995), which calls for a research study]
- Eliminate deductibles, co-pays, or coinsurance at the point of medical care
- Have an equitable and affordable financing structure, based on ability to pay with premiums and business health taxes utilized to finance the cost
- Reduce costs by negotiating fair prices with providers and lowering administrative costs, not by restricting access to care
- Establish a fair, simple, and efficient system of provider payment

- Ensure adequate provider supply
- Continue Minnesota's leadership in medical education, research, and technology

Additionally, the State passed SF 2995, which includes financial support to undertake an economic analysis to model the potential impact of the MHP proposal relative to the status quo over a 10 year time horizon ("*Analysis of Benefits and Costs of Universal Health Care Financing System*"; Laws of Minnesota 2023, Chapter 70, Article 16, Section 19). Provisions call for the study to compare the proposed MHP to the status quo with respect to several outcomes, including coverage, benefit completeness, underinsurance, system capacity, and health care spending. The final study report will be due to the governor and legislative leaders by January 15, 2026.

The Minnesota Department of Health (MDH) contracted with the UMN-SHADAC team to conduct a comprehensive review of selected already existing state and federal efforts to model single-payer legislative proposals with the following goal:

1. To critically review existing state and federal modeling efforts of single-payer proposals to better understand the data sources and methodological approaches used, including the incorporation of scholarly evidence into modeling assumptions.

METHODS

The UMN-SHADAC team conducted a scan of all 50 states and the District of Columbia to identify states with single-payer legislation and related empirical analyses of the proposed impact. This review led to the identification of nine states for consideration.

The team established the following criteria to evaluate candidate states for consideration:
- Demonstrated similarities with Minnesota in terms of population size and rurality, insurance coverage distribution, and insurance regulatory landscape
- Demonstrated similarities in response to the Affordable Care Act (ACA) coverage expansion (e.g., expanded eligibility for Medicaid and operation of a state-based insurance marketplace)
- Demonstrated similarities with respect to provider market structure and capacity (e.g., presence of vertically integrated delivery systems, primary care health professions shortage areas) as well as employer-sponsored insurance prevalence and funding, including the percentage of private sector enrollees in self-insured plans
- State single-payer proposals and analyses occurred after passage of the Affordable Care Act in 2010
- Variation across state studies with respect to the particular contractors and modeling approaches used

Based on these criteria, the UMN-SHADAC team communicated its initial recommendations. MDH responded with its preference for a final set of studies to review, including one state study not originally on UMN-SHADAC's recommended list along with one national study. The final set of studies reviewed include:
- California (CA): Pollin, R. et al (2017). *Economic Analysis of the Healthy California Single-Payer Health Care Proposal (SB-562)*
- New Mexico (NM): KNG Health Consulting, LLC, IHS Markit, Reynis Analytics (2020). *Fiscal Analysis of New Mexico's Health Security Plan: Final Report*

- Oregon (OR): White, C. et. al (2017). *A Comprehensive Assessment of Four Options for Financing Health Care Delivery in Oregon*
- Vermont (VT): Hsiao, W. et al. (2011) *Act 128 Health System Reform Design: Achieving Affordable Universal Health Care in Vermont*
- Washington (WA): Friedman, G. (2021) *Funding universal health care in the State of Washington: Replacing an inefficient, inequitable, and destructive health care finance system with a fair system that will promote economic efficiency and better health*
- Congressional Budget Office (CBO): CBO Single-Payer Health Care Systems Team. (2020). *How CBO Analyzes the Costs of Proposals for Single-Payer Health Care Systems That Are Based on Medicare's Fee-for-Service Program, Working Paper 2020-08*

Next, the UMN-SHADAC team developed a structured template to extract relevant information from each study for the following domains:
- Model Background
- Population Attributes
- Benefit Design Attributes
- Utilization, Price, Spending, and Administration Attributes
- Behavioral Assumptions of Key Stakeholders
- Outputs Reported
- Financing Assumptions

Additionally, where relevant, the UMN-SHADAC team summarized the single-payer legislative language when reviewing the corresponding model reports.

After receiving MDH's approval for the template, the UMN-SHADAC team conducted the data extraction from October 2023 to December 2023. During this time, the UMN-SHADAC team provided a preliminary summary to MDH to obtain additional feedback on MDH's priorities within the seven domains.

This critical review is subject to four main limitations. First, the state studies selected for review do not reflect the universe of states that have pursued single-payer legislation and/or supported economic analyses to quantify the potential impact of shifting from the current private-public mixed financing system to a state-based, single-payer system. Second, the data extraction and analysis undertaken by the UMN-SHADAC team were performed using publicly available documents, without any consultation with applicable state or federal agencies or vendors that were contracted to conduct the single-payer analyses. Third, we do not directly consider financing assumptions in this review as it is outside the scope of the MHP legislation. Finally, we did not focus on any aspects of single-payer governance (e.g., board composition, ethics and conflict of interest, rulemaking, grievances, etc.) as that is not typically included as part of policy simulation models for understanding economic and health impact.

SYNTHESIS OF CRITICAL REVIEW OF SINGLE-PAYER STUDIES

For each domain and section in this synthesis, we (1) summarize the relevant provisions in the MHP legislation; and (2) articulate key findings from the state and federal study review based upon the data extraction.

This synthesis is organized into six subsections that correspond to six of the eight tabs from the study extraction summary table. Subsections were defined based on their alignment to the

proposed MHP and analysis legislation as well as to the priorities indicated by MDH staff (e.g., actuarial value, benefit design, and behavioral assumptions related to individuals' take-up and employer offers). For more detail, see the final study extraction summary table.

Model Background and Data Sources

MODELING TYPE AND TIME HORIZON

State of Minnesota Legislation: SF 2995 calls for an economic analysis to "…measure the performance of both the proposed Minnesota Health Plan and the current public and private health care financing system over a ten-year period to contrast the impact of these approaches on…" on coverage, benefit completeness, underinsurance, system capacity, health care spending.

Insights from State and CBO Analyses: Policy analyses of state-specific, single-payer proposals use two distinct modeling approaches. One is a microsimulation modeling approach, which uses micro-data on persons (or households, employers, and/or other micro-units) and simulates the effects of the policy change on each of these units (e.g., NM, OR, VT).[1,2] The other approach is a spreadsheet model (also referred to as cell-based or cohort model) that relies upon aggregate data (e.g., National Health Expenditure Account (NHEA) spending) (e.g., CA, WA).

Both model types incorporate estimated behavioral response parameters derived from scholarly evidence. The CBO modeling approach includes developing baseline projections of national health expenditures, which are then used in a custom spreadsheet-based model to estimate the impact of illustrative single-payer options with respect to both federal spending and national health expenditures.[3] Multiple states (NM, OR, and VT) as well as the CBO provide a summary of qualitative data collection (e.g., document review, expert interviews, public comments) that informed their approaches.

State-specific model analyses vary in the level of detail provided regarding data sources, insurance benefit designs, behavioral assumptions of key stakeholders, and outputs. Studies that provide relatively greater detail include NM, VT, and OR, whereas WA and CA provided relatively less detail. The CBO report models five illustrative single-payer scenarios and offers a robust discussion of scholarly evidence to inform behavioral assumptions of key stakeholders, including both consumers and providers.

Models also vary in terms of the time horizons considered. For example, CA and OR provide 'point-in-time' estimates, NM provides estimates at 5 years (2024-2028), and WA and VT generate 10 year projections. CBO estimates are reported for 2030, a 10 year time horizon, as the model assumes the legislation establishing a single-payer system was enacted in 2020. Most models examined reference both policy scenario(s) and status quo.

DATA SOURCES

[1] Abraham, Jean. "Predicting the Effects of the Affordable Care Act: A Comparative Analysis of Health Policy Microsimulation Models." State Health Reform Assistance Network Policy Brief. March 2012.
[2] Ringel et al. "Modeling Health Care Policy Alternatives." October 2010, *Health Servies Research*, 40(5) Part II: 1541-1558.
[3] Congressional Budget Office, Working Paper 2020-08, December 2020.

<u>State of Minnesota Legislation</u>: Neither the MHP legislation nor SF 2995 include specific references to data sources to be used in the universal health care financing system study. The latter notes that the "commissioner of human services shall make available to the vendor selected under subdivision 3 any relevant findings from (1) any actuarial and economic analysis for a MinnesotaCare public option implementation plan and waiver; and (2) any analysis of a direct payment system."

<u>Insights from State and CBO Analyses</u>: The state and CBO single-payer studies utilize a variety of survey and administrative data sources to measure population attributes, insurance coverage status, premiums, provider payment rates, and administrative expenses. Most data sources were national, with some modified for state estimates [CA and WA]. To the best of our knowledge, no studies incorporated sub-state-level data. Below we detail the sources used for each of the following domains:

- *Population Attributes and Insurance Coverage Status*: Data sources include federal surveys (American Community Survey (ACS) [CA, NM, OR]; the Survey of Income and Program Participation (SIPP) [OR]; and the Current Population Survey (CPS) [CA, OR, VT, CBO]). Administrative data sources are used to capture public insurance enrollment (e.g., Medicaid enrollment files; CMS-64) [NM, CBO]. One state [VT] uses a state-specific household survey to estimate its rate of uninsurance. Two states [CA and OR] have state-specific health insurance surveys, but they were not used.
- *Health Care Spending (aggregate total, per capita, out-of-pocket):* Aggregate total spending estimates for states are commonly drawn from the National Health Expenditure Accounts (NHEA) [CA, OR, CBO]. The Medical Expenditure Panel Survey (MEPS) is also used by several studies for out-of-pocket, service type-specific, or coverage group-specific spending estimates [NM, OR, VT, CBO]. It is important to note that state-specific estimates are not available in the MEPS-Household Component (HC).
- *Health Care Utilization*: The MEPS-HC is used by NM for estimating service type-specific utilization.
- *Employer Sponsored Insurance (ESI) Provision*: Data from the MEPS-Insurance Component (MEPS-IC) [NM] and Kaiser Family Foundation-Health Research & Educational Trust (HRET) Employer Health Benefits survey are used for information on ESI offer rates and premiums [OR, VT, WA]. Premium data in CA were collected from its marketplace and the California Health Care Foundation (CHCF).
- *Provider Payment Rates*: Data sources include the Health Care Cost Institute (HCCI) for commercial claims summary data to measure prices relative to Medicare [NM], Medicare Hospital Cost Reports [OR], Medicaid claims [VT], and a state all-payer claims database (APCD) [VT]. CBO uses Centers for Medicare & Medicaid Services' (CMS') Medicare fee schedule.
- *Long-Term Services and Supports (LTSS) Utilization and Spending*: Data sources include the National Post-Acute and Long-Term Care Study[4] data [CBO], Medicaid Financial Management Reports [CBO], the American Community Survey [CBO], and the Health and Retirement Study [CBO]. Medicaid claims data are used by the one state that modeled LTSS coverage [VT].
- *Provider Administrative Expenses*: Data-based estimates of provider administrative expenses for hospitals and physician practices come from Medicare hospital cost reports [NM] or provider surveys [VT].

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[4] National Post-acute and Long-term Care Study webpage. National Center for Health Statistics, Centers for Disease Control and Prevention. https://www.cdc.gov/nchs/npals/index.htm Accessed February 7, 2024

- *Provider Workforce*: Information comes from state occupational licensure data [NM], the Area Health Resource File [OR], provider surveys [OR and VT], and Medicare hospital cost reports [OR]. No models, to the best of our knowledge, attempt to estimate the private insurance organization workforce within a given state.

Inputs: Population

ELIGIBILITY AND EXCLUDED POPULATIONS

State of Minnesota Legislation: All Minnesota residents are eligible for the MHP, including those who are temporarily out of the state and intend to return to and reside in Minnesota. The MHP provides coverage for Minnesota residents who have out-of-state emergency care or routine care for those living in border communities. Nonresidents employed in Minnesota may be able to be covered under an optional premium schedule. Nonresidents who are visiting Minnesota and utilize services will be billed. The SF 2740 legislation also notes that the plan will serve as a secondary payer to existing government programs and plans (e.g., Medicare, Medicaid, VA, and subsidized Marketplace coverage (Advanced Premium Tax Credits) in the event that waivers, exemptions, agreements, and/or legislation are not obtained and funding is not transferred to the MHP.

Insights from State and CBO Analyses: Consistent with Minnesota's plan, state residency is the primary requirement for eligibility noted in most studies. Studies go on to identify both included and excluded populations, usually based on specific coverage types or population segments. Studies assume receipt of federal waivers to operate public programs under their single-payer plan.
- *Employer Sponsored Insurance (ESI) Eligible Populations*: States generally stratify ESI-eligible populations by whether the employer source is self-insured or fully-insured. In all examined states [CA, NM, OR, VT, and WA] and CBO, ESI fully-insured (purchased) populations are expected to shift into the single-payer plan. In NM and WA, the single-payer plan is specified as optional for those affiliated with self-insured employers. The CBO assumes that almost all individuals with ESI will shift into the single-payer plan if private insurance is not allowed to cover any benefits that are duplicative with the single-payer plan design. Importantly, there are assumed interactions between the financing mechanisms that a state adopts to pay for its single-payer plan and employer behavior. For example, VT assumes that individuals with ESI shift to the single-payer system as a result of the state using payroll taxes as a primary source of financing. Additionally, some studies [NM, OR, VT] directly discuss how the Employee Retirement Income Security Act (ERISA) may affect the ability of state governments to influence employer behavior with respect to provision of coverage.
- *Medicaid and Medicare*: All studies indicate eligibility of Medicaid populations for the single-payer plan. Most studies assumed enrollment of Medicare beneficiaries, with NM as an exception. The WA study considers Medicare populations as having the option to participate in the single-payer plan. The VT study indicates that Medicare beneficiaries would maintain their benefit packages (which would differ from the single-payer benefit design), but utilizes a central claims processing system. CBO assumes Medicare and Medicaid enrollees would move to the single-payer plan.
- *Individual Market*: If federal waivers are obtained, it is assumed that enrollees would shift to the single-payer plan. The WA study does not specify this explicitly.

- *Active Military and Veterans*: There is ambiguity across studies regarding the inclusion or exclusion of active military or veterans.
- *Indigenous Populations*: There is ambiguity across studies regarding the inclusion or exclusion of Indigenous people, including individuals eligible for coverage and services through the Indian Health Service (IHS).
- *State and Federal Government Employees*: The treatment of state and federal employees, i.e., Federal Employees Health Benefits (FEHB) Program, who reside in the state is not clearly addressed across all studies. Oregon notes that its public employees and educators would be included. The CBO notes that a national single-payer system would replace FEHB. It is unspecified in other studies.
- *Uninsured Persons*: States assume eligibility of uninsured persons for the single-payer plan. New Mexico maintains its one-year residency requirement for eligibility.
- *Undocumented Persons*: Only OR explicitly references undocumented persons as eligible. Both VT and CBO refer to eligibility of residents, regardless of legal status.

Inputs: Benefit Design

COVERED SERVICES

State of Minnesota Legislation: Under the MHP, enrollees maintain coverage for medically necessary services and supplies to "promote health and to prevent, diagnose, or treat a particular medical condition meeting accepted standards of medical practice within a provider's professional peer group and geographic region." Covered services include:

- inpatient and outpatient facility services
- inpatient and outpatient professional health care provider services
- diagnostic imaging, lab services, other evaluative services
- medical equipment, supplies, including prescribed dietary and nutritional therapies, appliances, and assistive technology, including prosthetics, eyeglasses and hearing aids, their repair, technical support, and customization needed for individual use
- inpatient and outpatient rehabilitative care
- emergency care, emergency transportation

- necessary transportation services for health care for those with disabilities or low-income
- child and adult immunizations and preventive care
- reproductive and sexual health care
- health and wellness education
- hospice care, skilled nursing facility (SNF) care, home health care including health care provided in an assisted living facility
- mental health services, substance abuse treatment
- dental care, vision care, hearing care
- prescription drugs and devices

- podiatric care
- chiropractic care
- acupuncture, safe and effective care as indicated by the National Institutes of Health (NIH) National Center for Complementary and Integrative Health
- blood and blood products
- dialysis
- adult day care, rehabilitative and habilitative services
- ancillary health care or social services previously provided by MN's public health programs, case management and coordination
- language interpretation and translation for health care services

- LTSS currently covered for persons on Medical

Assistance, including HCBS waivered services

The MHP excludes coverage for cosmetic services, services without medical benefit, and services provided by an unlicensed facility or provider. Additionally, no payments are to be made for prescribed medicines if pharmaceutical companies directly market those drugs to consumers in Minnesota.

Insights from State and CBO Analyses: All state and CBO studies provide some discussion of the set of covered services. There is significant variation across studies in the degree to which specific service types are explicitly noted as being included or excluded.

- It is reasonable to assume that all modeling efforts reflect provision of "comprehensive medical benefits," based on language included (e.g., "All medically appropriate health care benefits" [CA]; "comprehensive benefits package comparable to what is currently available to state's public employees" [NM]; "essential health benefits for all" [OR]; "comprehensive benefits package of medically necessary care…" [WA]).
- Most states and CBO explicitly note the inclusion of mental health and substance use services. The exceptions are CA and NM, where it is unspecified.
- Only VT and the CBO model explicitly include coverage for long-term care benefits. Vermont articulates coverage for "…a continuum of services from institutional to home care, to custodial care, to informal caregivers." In its Option 5 scenario, the CBO articulates "…a broad LTSS benefit that would be available to anyone who has one or more limitations on activities of daily living (ADL) or instrumental activities of daily living (IADL)." Under this option, they would provide coverage for home and community-based services (HCBS), similar to those currently offered to any Medicaid beneficiary by any state's Medicaid program.
- Most studies specify coverage for dental services. Dental services coverage is not specified for NM, and OR limits coverage to pediatric dental initially.
- States vary on the inclusion of vision and hearing services. CA, VT, WA, and CBO all indicate *some* coverage. NM is unspecified, and OR limits vision coverage to the pediatric population, but includes both pediatric and adult hearing services.
- Non-emergency medical transportation benefits are noted by two studies [OR, CBO].
- We did not observe any reference to interpretation services by any studies.

COST-SHARING AND PLAN GENEROSITY

State of Minnesota Legislation: The MHP legislation articulates that there are no deductibles, co-payments, coinsurances, or other cost-sharing with respect to covered benefits. All *medical services* provided in skilled nursing facilities (SNFs) or assisted living (AL) facilities are fully covered, but cost-sharing may be imposed for SNF/AL room and board for patients not meeting income and asset qualifications based on Medical Assistance standards.

Insights from State and CBO Analyses:
- Only CA models provisions with no cost-sharing, similar to the MHP. This is equivalent to a 100% actuarial value (AV).
- NM's proposal is the least generous in terms of cost-sharing requirements.
- Other studies model benefit designs that include some cost-sharing [NM, VT, CBO] and/or varied actuarial values by specific service types [VT: 88% AV for medical services and 79% AV for pharmacy benefits.]
- Cost-sharing provisions modeled also vary by observed population attributes, including income-level [NM, OR, VT] or for Native American people [NM].
- State studies vary in whether they report actuarial value assumptions about either the current state or proposed policy. For example, OR articulates a policy where those with incomes <250% FPL have 100% AV coverage, and those with incomes greater than or equal to 250% FPL have an AV of 96% (aligned to their state employees' plan).

Inputs: Utilization, Prices, Spending, Administration

State of Minnesota Legislation: MHP language indicates that the Board shall establish and oversee a fair and efficient payment system for noninstitutional providers and will establish negotiated rates with providers that take into account the need to address provider shortages. Language regarding the payment system distinguishes between non-institutional providers (e.g., individual physicians and other clinicians, group practices, outpatient surgery centers, imaging centers, and other facilities that do not provide overnight care) and institutional providers (e.g., inpatient hospital, skilled nursing facility, rehabilitation facility, or other health care facilities that provide overnight care). From earlier documents summarizing single-payer proposals in Minnesota, a fee schedule per service would be defined for non-institutional providers and global budgets for institutional providers, based on past performance and projected changes in prices and utilization.

The current MHP legislation *does not* articulate any specific assumptions about provider payment levels. The SF 2995 provisions note that, "the analysts shall not assume that payment rate negotiations will track current Medicaid, Medicare, or market payment rates or a combination of those rates, because provider compensation, after adjusting for reduced administrative costs, would not be universally raised or lowered but would be negotiated based on market needs, so provider compensation might be raised in an underserved area such as mental health but lowered in other areas."

From SF 2995, provider and plan-specific administrative savings are assumed based on the absence of provider networks, prior authorization requirements, alternative payment schemes, or risk adjustment mechanisms. The model assumes that while gross provider payments may be reduced to reflect reduced administrative costs, net provider income would remain similar to the current system, given lower administrative costs.

Insights from State and CBO Analyses:
- *Utilization:* Only one model [NM] explicitly estimates utilization and prices to arrive at population-level spending estimates to reflect the status quo. This model allows payment rates to vary by service types and payer [e.g., NM's policy environment includes both its proposed Health Security Plan as well as its employer-based system and Medicare as separate payers initially].
- *Medical Services Provider Payment Methodology and Rate Assumptions:* We infer that most studies assume fee-for-service payment methods for non-institutional providers with fee schedules administratively set prospectively and linked to Medicare (e.g., language in the study documentation typically characterizes rates set as a percentage of Medicare's rates) [NM, VT, CBO]. One study [CA] allows for negotiation of rates.

  Some state studies note system savings from reducing prices under the single-payer plan for privately insured populations [OR, WA].

  The CBO study discusses provider payment rate variation extensively. In their scenario with "higher payment rates," providers are assumed to be paid close to an average payment rate across all payers (including government programs and private insurers).

  NM and CBO studies include language that speaks to how payment rates are assumed to grow over time. NM constrains payment growth to the medical component of the Consumer Price Index (CPI). CBO makes assumptions about rates of growth (or rates of decrease) in institutional and non-institutional providers' rates after 2030. Within the time horizon of their analysis, they note that the distribution of payment rates would be compressed around the nationwide average.

  Assumptions about payment systems and levels for institutional providers (hospitals and skilled nursing facilities) are more variable. NM articulates the use of global budgets. OR assumes significant elements of existing value-based payment models (e.g., shared savings arrangements or global budgets). CA notes use of episode of care-based payment. VT indicates eventual use of risk-adjusted capitation

payments or global budgets. CBO continues to employ administratively set prices (e.g., 142% of Medicare fee schedule in one scenario).

Two studies reference the use of supplemental payments: one for rural or underserved populations [NM]; and another for graduate medical education or new technology investments [CBO].

- *Pharmaceutical Pricing:* There is wide variation in approaches to prescription drug pricing assumptions. In general, articulated methods are relatively vague across studies [e.g., "Bulk drug purchasing" (NM), "Canadian Medicare using regulated prices" (CA)].

Estimated savings potential is very wide, from NM assuming 3.5% savings to CA assuming cost savings potential of at least 30% to WA assuming reduction in drug prices by 45%. The CBO notes administratively set prices that would be equal to the average of projected prices for all payers under current law in 2025 (after accounting for rebates and discounts). Prices would then increase at the rate of CPI for urban consumers plus 4 percentage points.

- *Spending:* Studies generally rely on state-specific health care spending estimates (per capita or aggregate) from NHEA [CA, NM, WA, CBO]. VT notes use of MEPS-IC (premiums), their APCD, Blue Cross Blue Shield of VT data, and the VT Health Care Expenditure Analysis Report.

CBO uses service categories and payment sources from the MEPS-HC to allocate projections of personal health care spending (NHEA) across population segments (privately insured, Medicare, Medicaid/CHIP, other coverage, uninsured, people not lawfully present). It is assumed that they use this as part of their spreadsheet model development.

   o *LTSS Spending:* For VT, modelers use assumed elasticities of demand to predict increases in spending. For CBO, LTSS spending is estimated for Medicaid and "All Other." Regarding Medicaid LTSS, CBO estimates an increase in Medicaid spending over the 10-year period due to projected growth of payment rates for LTSS providers, projected enrollment in Medicaid by eligibility group, and the assumption that LTSS will continue a longstanding shift from institutions to community settings. Regarding non-Medicaid financed LTSS, CBO's projections incorporate a modest decline in the number of institutional LTSS users because of the shift toward community-based care, but an increase in spending for institutional LTSS due to projected growth in the costs of institutional care.

- *Provider Administration:* Models consider provider administrative costs, offering estimates related to the "status quo" and making assumptions about how such costs would change under a single-payer policy. Savings from a single-payer plan are generally assumed as either justification for lower provider payment rates and/or allowing for the re-deployment of resources from administrative to clinical delivery functions.

   o *Hospitals and Institutional Providers*: The status quo administrative expenses for hospitals (and other institutional providers) range from 8.5% of revenues (CA) to 24.5% of total hospital expenses (NM, WA). In VT, "Billing and Insurance Related" (BIR) administrative costs are assumed to be in the range of 4.8% to 10.8% of hospital operating expenses as of the study year (2011). CBO estimates the status quo at 19% of hospital net revenues.

   o *Non-Institutional Providers*: Estimates range across studies: NM reports 7.6% of physician practice costs; CA reports 13% of revenues; VT assumes BIR of between 10-19% of practice revenue; and CBO considers monetary and time costs with physicians estimated to spend 15% of net revenues and other providers estimated to spend 9% of net revenues on administration. Time costs are also noted with 10% of time on administrative activities for physicians and 23% for nurses.

In terms of levels of assumed provider administrative savings, there is a great deal of variation across studies. For example, CA assumes 50% savings potential across institutional and non-institutional settings. CBO reports 35-40% reductions in administrative spending under a single-payer system. WA assumes providers would decrease administrative spending shares from 24% to 14% (representing a 42% reduction). VT assumes BIR would fall to roughly 1.5% of expenses (more than a 50% reduction for this subset of administrative spending).

- *Plan Administration*: All studies provide language reflecting the estimated 'status quo' for plan administrative expenses. Some states report this separately for insurance segments (NM, OR, WA, CBO). Others provide an average value (e.g., 8.5% - CA, 11.4% - VT).
    - ESI: 12% administrative loads (NM); 8-15% for large and small group policies (OR); 12% (WA); 15% (CBO)
    - Individual: 13% (OR)
    - Medicaid: 12% (NM), 8% (CBO)
    - Medicare Fee-for-Service ("traditional Medicare") program: 2% (CBO; WA)

    Assumed plan administration under single-payer proposals vary:
    - NM assumes plan administration would go from 9% to 5% over the five-year window.
    - OR assumes 8.2% of total health care expenditures, exclusive of oversight and administration by government agencies
    - CA assumes it goes to 5%
    - VT assumes 4.6%
    - CBO assumes 1.8% as a share of total spending. In their analysis, they consider different types of administrative spending – fixed, variable, new administrative spending, and additional costs for LTSS coverage administration (given scope and population expansion)

Inputs: Behavioral Assumptions

State of Minnesota Legislation: The legislation does not describe possible behavioral responses of key stakeholders when considering a shift from status quo to a single-payer system.

Insights from State and CBO Analyses: Policy simulation models generally make assumptions about behavioral responses of individuals and other stakeholders, given the policy change. In this context, we provide a summary below of assumptions related to the behavior and choices of individuals, employers, and providers in the context of introduction a single-payer plan.

- *Uninsured Individuals – Enrollment in Single-Payer Plan*: Four states [CA, OR, VT, and WA] assume all uninsured persons will enroll in single-payer plan. NM assumes that take-up of its plan among those who are uninsured would be similar to the take-up rate for Medicaid and subsidized Marketplace coverage. The CBO assumes that 99% of US residents would be insured. It also assumes that about 20% of residents not lawfully present would choose not to enroll due to fear about providing information to the federal government or because of challenges related to literacy or language.
- *ESI-Covered Persons in Fully-Insured Plans – Enrollment in Single-Payer Plan*: CA, NM, OR, VT, and CBO assume that all ESI-covered persons in fully-insured plans will enroll in the single-payer plan. This assumption is not articulated in one analysis [WA].
- *Employer Behavior and ESI-Covered Persons in Self-Insured Plans*: All states other than NM assume that ESI-covered workers and dependents will convert to the single-payer plan, though several studies offer cautionary language related to ERISA.
    - OR notes challenges that large and multi-state, self-insured employers may have with ceding control. OR leverages payroll taxes to fund their program, which changes employers' incentives around provision depending on incidence of those taxes. The modelers also note that the state would have to obtain a federal exemption to ERISA and that the single-payer option would likely be challenged in the courts by self-funded employers.
    - WA references ERISA as well, noting that the state cannot compel private companies to drop their commercial insurance, but it assumes that companies won't continue to offer their own coverage since employees can receive coverage at no cost from the state.
    - VT modelers offer extensive commentary related to the potential implications of ERISA for self-insured employer behavior and what aspects of a single-payer design might interact with ERISA.

- o NM's proposal retains a role for self-insured employers and models the decision to offer coverage based on competing choices and financial incentives from continuing to offer their own ESI coverage versus dropping coverage and having workers enroll in the Health Security Plan. NM assumes that employers that do not offer a self-insured plan would contribute a percentage of payroll toward the cost of their state-based plan. NM assumes that the state would be able to develop an ERISA-compliant approach, such that the state could collect funds through a payroll fee on employers whose workers get coverage through the Health Security Plan.
- *Other Employer Behavior – Wage Pass-Backs*: One model [OR] explicitly considers potential wage pass backs to workers when employers stop contributing to ESI plans (thus raising workers' income). This is assumed to occur for employers who offered insurance previously and had savings in excess of payroll tax obligations. They assume 80% of net savings to be passed back in the first year, 60% in year two, 40% in year 3, and smaller percentages in years 4 and 5. For VT, the model also assumes that wages adjust to changes in employer-based spending (e.g., premiums or payroll taxes to finance a single-payer plan).
- *Individuals' Demand for Medical Care*: Multiple studies rely on scholarly evidence to inform assumptions about how medical care utilization and spending is expected to change under a single-payer plan relative to the status quo. Behavioral assumptions vary by population segment and service type.
    - o *Demand Responses Among Uninsured Individuals Who Gain Coverage*: Studies varied significantly in their approaches. For example, NM adjusted estimates from the Oregon Health Insurance Experiment to assume the percentage increase in utilization from gaining insurance. CA assumed spending levels would double from providing 'full' coverage to the currently uninsured. WA assumed an overall increase in utilization of 8%. OR assumed that supply constraints would limit the magnitude of the demand response in general. The CBO also utilized estimates from the Oregon Health Insurance Experiment, but calculated a weighted average of estimates, assigning the Oregon experiment 50% of the total weight and other studies' estimates 50% of the total weight.
    - o *Demand Responses Among Existing Insured Persons Who Gain Access to More Generous Coverage via Lower or No Cost-Sharing*: Studies primarily relied on estimates from the RAND Health Insurance Experiment (e.g., 10% decrease in cost-sharing associated with a 2% increase in utilization; NM and VT) and Brot-Goldberg et al. (e.g., 36% of Californians who are underinsured will increase their health care spending by 15%; WA estimates an increase in utilization of between 4-5%) to inform assumptions about demand responses among currently insured. The CBO used demand elasticities similar to the RAND Health Insurance Experiment findings.
    - o *Demand Responses for Long-Term Services and Supports*: Only VT and CBO include LTSS in their modeling efforts. For VT, they assume an elasticity of demand of -0.7. The total additional cost would be the sum of amounts paid out-of-pocket plus higher utilization as a result of insurance. CBO estimated that the number of users of LTSS in institutional care would not change. They estimate that 25% of people who are not projected to use HCBS under current law would become users of paid care by the single-payer and, thus, project a sizable increase in the number of HCBS users in Medicaid. CBO also addresses the supply of HCBS workforce and estimates an elasticity of supply of 20.
- *Individuals' Labor Supply*: One state [OR] models general employment effects of the single-payer plan. They do this using the IMPLAN simulation model (a model used to estimate economic impacts). New Mexico also uses the IMPLAN model to estimate the in-state economic contribution of spending under their single-payer plan.
- *Providers' Labor Supply and Service Supply Responses*: Assumptions across studies vary widely in terms of how providers are expected to respond to a changed work environment under a single-payer plan.
    - o *Supply Responses to Increased Demand via Coverage Expansion*: NM assumes that provider labor supply fully adjusts to increased demand from expanding coverage and reduced cost-sharing faced by residents. In contrast, OR and CBO both expect that increases in patient demand for care will exceed provider supply expansion. The former [OR] uses the PADSIM model to simulate providers' desired output of health care services. In turn, this allows for

adjustment of utilization and spending from the COMPARE model.[5] The latter notes that estimated increases in demand under single-payer would be larger than what happened via the Affordable Care Act (ACA). Specifically, the CBO assumes that providers of physician and clinical services would increase supply of care to meet about 20% of the initial gap between increased demand for and supply of services. Studies varied to the extent they incorporated 'freed up' capacity by providers to deliver additional care as a result of less time spent on administrative tasks (e.g., prior-authorization requests).

- o *Supply Responses Due to Payment Changes and Changes in Utilization Management*: NM assumes a 2% reduction in spending for facilities as a result of global budgeting. CA cites 'mixed evidence' on the extent to which physician-induced demand might occur under a single-payer system without significant utilization management. The CBO offers the most granular approach to modeling quantity of care supplied in response to changes in payment rates. Elasticity estimates are small and range from 0 to 0.45.
- *Private Insurer Behavior*: State studies offer very little analysis or commentary on private insurer behavior, given that the single-payer plan would essentially eliminate private insurance or reduce its market to policies for services that are not covered by the single-payer plan. The CBO notes that private insurers may still play some role in administering coverage (akin to their claims adjudication role in traditional Medicare).

Outputs

State of Minnesota Legislation: The summary for SF 2995 calls for several outputs to be provided as part of the *Analysis of Benefits and Costs of Universal Health Care Financing System Study.* The first three columns of Table 1 below list proposed output domains, measures, and stratifications indicated in the MHP legislation and/or study funding legislation. The fourth column (far right) maps outputs provided in the studies generated by other states and the CBO.

Table 1: Output Domains Proposed in Minnesota Legislation and Reported in Examined Studies

Output Domain	Measure	Stratification or Distribution	Modeled Outcomes Reported in Single-Payer Studies
Coverage	# of people with and without health insurance		Enrollment by coverage type (CA, NM, OR). Insured/Uninsured (CA, VT, CBO).
Benefit completeness	# of people with and without coverage for needed services	By specific service type (dental, LTSS, medical equipment and supplies, vision and hearing, other) By market segment	Not reported for either status quo or under policy scenarios.
Underinsurance	# of people who cannot afford (i.e., deductible, Out-of-Pocket) needed care/for whom costs prevent accessing care		Not reported with granularity for status quo or under policy scenarios. CA reports removal of cost-sharing constraint for 36% of insured population who are underinsured.
System capacity	Timeliness of care Appropriateness of care Preventable Emergency Department (ED) care	Preventable ED by geography, population group (iv)	Not estimated quantitatively. OR reports that congestion (difference between providers' availability and consumers' demand) is assumed to get worse. They note how payment levels and congestion are correlated.

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[5] White et al. 2017. *A Comprehensive Assessment of Four Options for Financing Health Care Delivery in Oregon.*

Output Domain	Measure	Stratification or Distribution	Modeled Outcomes Reported in Single-Payer Studies
			CBO discusses increase in demand for health care that would not be met. Assumed a decline in the supply of care could increase congestion in the system and reduce quality of care.
Health care spending	Total health care spending	By status quo and under MHP By public and private payers By individuals, employers, government By service type (medical, dental, mental health, LTSS)	Total spending (CA, NM, OR, VT, WA, CBO) Total spending by insurance category, coverage comprehensiveness, or income group (CA, OR, VT) Total spending changes by specific parameters including Out-of-Pocket medical spending (CBO) Out-of-pocket spending (NM – not necessarily only medical care) (OR - health care expenditures by income group) (WA, CBO – aggregate)
Costs/ savings under MHP due to:	Administrative savings (provider and plan) (i)		WA assumed savings from fraud reduction and provider administrative savings (not model output)
	Provider global budgeting (i)		Not reported
	Price negotiations for pharmaceuticals and other medical services/products (ii)		Not reported
	Prevention, early intervention, health promotions and associated impact on utilization, health outcomes, workplace absenteeism (iii)		NM: Used IHS Markit Disease Prevention model to estimate life years saved from coverage expansion and access to preventive care. WA: Back of the envelope estimate of reduction in potential years of life lost (PYLL)
	Mental Health and Substance Use Disorder (SUD) coverage and associated impact on non-health care government expenditures, i.e., crime, out of home placements (v)		Not reported
	Job losses/gains (vi, vii)	By health care system only; economy as a whole	Health care employment effects: estimates provided on insurance-related, health-related, and other job types (OR) Qualitative commentary on private insurance jobs (NM, CBO – due to demand for claims processing and administrative functions); CBO also assumed employer compensation would shift from providing insurance to higher wages, which could encourage entrepreneurship and boost productivity Overall employment/labor supply: used IMPLAN to estimate changes in employment or economic spending overall (NM, OR); estimated changes to state employment (VT)
	Disparities in access and outcomes (viii)		NM: used IHS Markit Disease Prevention Microsimulation Model to estimate long-term effects of expanded coverage and access to preventive care over 10 years; estimates of life years saved

Output Domain	Measure	Stratification or Distribution	Modeled Outcomes Reported in Single-Payer Studies
			WA: estimates of mortality and preventable years of lives lost
			Qualitative commentary on effects on quality of care, patient satisfaction and health (CBO)
	Care coordination and case management (ix)	By providers, plans	Not reported

Source: UMN-SHADAC review of MN legislation and selected single-payer studies, 2023.
Note: Roman numerals in the second and third columns align with those in the legislation: ("Analysis of Benefits and Costs of Universal Health Care Financing System"; Laws of Minnesota 2023, Chapter 70, Article 16, Section 19).

Insights from State and CBO Analyses: Minnesota is seeking to model outcomes across several domains. As noted in the table above, the most common model outputs across the studies reviewed fell under the coverage and spending domains. Several outputs of interest were either not modeled or modeled in the aggregate only.

There are limited examples of outcomes modeled for different population subgroups and limited consideration given to the equity implications of the policies. Moreover, we did not observe model outputs at sub-state levels of geography. For the purpose of estimating potential costs or savings of single-payer plan adoption, several studies made assumptions about the timing and impact of plan implementation. However, these findings are not outputs of the microsimulation or spreadsheet models. In some studies, outcomes of interest, such as quality of care, were presented only through qualitative discussion.

Appendix: Select Research Cited in Reviewed Studies

The following sources were identified to have shaped the six single-payer legislative analyses. We have listed them in line with the structured template and indicate in which state/national study they appear in parentheses.

MODEL BACKGROUND

INPUT DATA SOURCES

HEALTHCARE SPENDING
- Favreault, M. M. (2020). Incorporating Long-Term Services and Supports in Health Care Proposals: Cost and Distributional Considerations. Urban Institute. Retrieved from *https://www.urban.org/research/publication/incorporating-long-term-services-and-supports-health-care-proposals*. **(CBO)**

PROVIDER PAYMENT RATES
- McKellar, M., Landrum, M. B., Gibson, T. B., Landon, B., Naimer, S., & Chernew, M. E. (2012). Geographic variation in health care spending, utilization, and quality among the privately insured. Institute of Medicine. **(Oregon)**

INPUT UTILIZATION, PRICE, SPENDING, AND ADMINISTRATION

CARE COORDINATION
- Yong, P.L., Saunders, R.S. and Olsen, L.A. (2010). The Healthcare Imperative: Lowering Costs and Improving Outcomes. Institute of Medicine, National Academies Press: Washington, D.C. **(California)**

PROVIDER PAYMENT/UNIT PRICE ADJUSTMENTS

LEVELS (% OF MEDICARE FEE SCHEDULE; AVERAGE OF EXISTING BASE CASE LEVELS)
- London, K., Grenier, M., Seifert, R., Friedman, T., Peper, J., Lambert, J., Neiman, D., and Bradley, C. (2013). State of Vermont Health Care Financing Plan Beginning Calendar Year 2017 Analysis. University of Massachusetts Medical School, Center for Health Law and Economics, and Wakely Consulting Group, Inc. **(Oregon)**
- Medicare Payment Advisory Commission. (2014). Report to the Congress: Medicare Payment Policy. Washington, DC. Retrieved from *https://www.medpac.gov/document/report-to-the-congress-medicare-payment-policy-march-2014/*. **(Oregon)**
- Nguyen, X., Kronick, R., and Sheingold, S. (2013). "Comparing Physician Payment Rates Between Medicare and Private Payers in 2009," presentation at AcademyHealth annual meeting, Washington, D.C. **(Oregon)**
- Pelech, Daria M. (2020) "Prices for Physicians' Services in Medicare Advantage and Commercial Plans," Medical Care Research and Review. *https://doi.org/10.1177/1077558718780604* **(CBO)**
- Trish, Erin, and others (2017) "Physician Reimbursement in Medicare Advantage Compared With Traditional Medicare and Commercial Health Insurance," JAMA Internal Medicine. *http://dx.doi.org/10.1001/jamainternmed.2017.2679*. **(CBO)**
- Wakely Consulting Group and the Urban Institute (2014). Oregon Basic Health Program Study. Oregon Health Authority, Oregon Health Policy Research. *http://www.ocpp.org/media/uploads/pdf/2014/11/Oregon_BHP_Report20141029.pdf* **(Oregon)**
- Zuckerman, S., Goin, D. (2012). How Much Will Medicaid Physician Fees for Primary Care Rise in 2013? Evidence from a 2012 Survey of Medicaid Physician Fees, Kaiser Commission on Medicaid and the Uninsured. *http://www.kff.org/medicaid/upload/8398.pdf* **(Oregon)**

PROVIDER PAYMENT GROWTH RATE ASSUMPTIONS
- Colman, P. (2014) "Portrait of Oregon Businesses by Size of Firm," State of Oregon Employment Department. **(Washington)**

MEDICAL SPENDING FOR COVERED SERVICES

CONSTRUCTED (SERVICE TYPE UTILIZATION*PRICES), ESTIMATED SPENDING BY SERVICE TYPE, PER CAPITA SPENDING OVERALL

- Eiken, S. et. al. (2018). Medicaid Expenditures for Long-Term Services and Supports in FY 2016 (IBM Watson Health, May 2018), Figure 8, *www.medicaid.gov/sites/default/files/2019-12/ltssexpenditures2016.pdf* **(CBO)**

PRESCRIPTION DRUG PURCHASING

COST CONTAINMENT STRATEGIES/PAYMENT SYSTEM

- Steinborn, J. and Ferrary, J. J. (2019). Fiscal Impact Report. New Mexico Legislature *https://nmlegis.gov/Sessions/19%20Regular/firs/SB0131.PDF*. **(New Mexico)**

ASSUMED CHANGES IN PRICES OR SPENDING

- Farrell, D., et. al. (2008). Accounting for the cost of US Health Care: A new look at why Americans spend more. McKinsey & Company. *https://www.mckinsey.com/industries/healthcare/our-insights/accounting-for-the-cost-of-us-health-care* **(Washington)**

PLAN ADMINISTRATION COSTS (PERCENTAGE OF SPENDING)

ADMINISTRATIVE EXPENSES – % OF MEDICAL CARE SPENDING OR % OF PREMIUM; SOURCE/JUSTIFICATION

- BISHCA. (2009). Health Plan Administrative Cost Report I. Department of Banking, Securities & Health Care Administration, Editor. Montpelier **(Vermont)**
- Jiwani, A., Himmelstein, D., Woolhandler S., and Kahn, J.G. (2014). Billing and insurance-related administrative costs in United States' health care: synthesis of micro-costing evidence. BMC Health Services Research. 14:556. **(California)**
- Kahn, J., Kronick, R., Kreger, M., Gans, D.N. (2005). The cost of health insurance administration in California: estimates for insurers, physicians, and hospitals. Health Affairs, 24(6):1629–1639. **(California)**

PROVIDER ADMINISTRATIVE COSTS (PERCENTAGE OF SPENDING)

- Casalino, L.P. et. al. (2016). "U.S. Physician Practices Spend More Than $15.4 Billion Annually to Report Quality Measures," Health Affairs. *https://doi.org/10.1377/hlthaff.2015.1258* **(CBO)**
- Casalino, L. P., S. Nicholson, D. N. Gans, T. Hammons, D. Morra, T. Karrison, and W. Levinson. 2009. What does it cost physician practices to interact with health insurance plans? Health Affairs. **(California)**
- Cutler, D.M. (2020). Reducing Administrative Costs in U.S. Health Care, Hamilton Project Policy Proposal. Brookings Institution. *www.brookings.edu/research/reducing-administrative-costs-in-u-s-health-care*. **(CBO)**
- Himmelstein, D. U. et al. (2014). A comparison of hospital administrative costs in eight nations: US costs exceed all others by far. Health Affairs, 33(9), 1586-1594. *https://pubmed.ncbi.nlm.nih.gov/25201663/* **(New Mexico)**
- Himmelstein, D.U. et al. (2020) Health Care Administrative Costs in the United States and Canada, 2017. Annals of Internal Medicine. *https://www.acpjournals.org/doi/10.7326/M19-2818?url_ver=Z39.88-2003&rfr_id=ori:rid:crossref.org&rfr_dat=cr_pub%20%200pubmed* **(New Mexico)**
- Kahn, J., Kronick, R., Kreger, M., Gans, D.N. (2005). The cost of health insurance administration in California: estimates for insurers, physicians, and hospitals. Health Affairs, 24(6):1629–1639. **(California)**
- Kahn, J. (2010). Excess billing and insurance-related administrative costs. In The Healthcare Imperative: Lowering Costs and Improving Outcomes. **(California)**
- Sakowski, J. A., J. G. Kahn, R. G. Kronick, J. M. Newman, and H. S. Luft. 2009. Peering into the black box: Billing and insurance activities in a medical group. Health Affairs. **(California)**
- Woolhandler, S. et. al. (2003). "Costs of Health Administration in the U.S. and Canada," NEJM 349(8) **(Washington)**
- Yong, P.L., Saunders, R.S. and Olsen, L.A. (2010). The Healthcare Imperative: Lowering Costs and Improving Outcomes. Institute of Medicine, National Academies Press: Washington, D.C. **(California)**

INPUT BEHAVIORAL ASSUMPTIONS

INDIVIDUAL BEHAVIOR

CHANGE IN UTILIZATION (NO COVERAGE TO SOME)

- Baicker, et. al. (2013). "The Oregon Experiment—Effects of Medicaid on Clinical Outcomes," New England Journal of Medicine. *https://doi.org/10.1056/NEJMsa1212321* **(CBO)**
- Card, David, Carlos Dobkin, and Nicole Maestas (2008). "The Impact of Nearly Universal Insurance Coverage on Health Care Utilization: Evidence From Medicare," American Economic Review. *doi.org/10.1257/aer.98.5.2242.* **(CBO)**
- Finkelstein, A., et al. (2012). The Oregon Health Insurance Experiment: Evidence from the First Year. The Quarterly Journal of Economics, 127(3), 1057-1106. *https://academic.oup.com/qje/article-abstract/127/3/1057/1923446* **(New Mexico)**

- Finkelstein, Amy N., et. Al. (2016), "Effect of Medicaid Coverage on ED Use—Further Evidence From Oregon's Experiment," New England Journal of Medicine. *dx.doi.org/10.1056/NEJMp1609533* **(CBO)**
- Hadley, J., & Holahan, J. (2004). The Cost of Care for the Uninsured: What Do We Spend, Who Pays, and What Would Full Coverage Add to Medical Spending?. Washington D.C. **(Washington)**

CHANGE IN UTILIZATION (LESS GENEROUS TO MORE)

- Aron-Dine, A., Einav, L. and Finkelstein, A. (2013). The RAND Health Insurance Experiment, Three Decades Later. Journal of Economic Perspectives 13(1): 197-222. **(California)**
- Brook, R.H. et. al. (1984). The Effects of Coinsurance on the Health of Adults: Results from the RAND Health Insurance Experiment. RAND Corporation. *www.rand.org/pubs/reports/R3055.html* **(CBO and Vermont)**
- Brot-Goldberg, Z., Chandra, A., Handel, B.R., and Kolstad, J.T. (2015). What Does a Deductible Do? The Impact of Cost-Sharing on Health Care Prices, Quantities, and Spending Dynamics. Faculty Research Working Paper Series. Harvard Kennedy School, Cambridge, MA. **(California)**
- Brot-Goldberg, Z. C., et. al. (2017). What does a deductible do? The impact of cost-sharing on health care prices, quantities, and spending dynamics. The Quarterly Journal of Economics, 132(3), 1261–1318. *https://doi.org/10.1093/qje/qjx013* **(Washington)**
- Newhouse, J. P. (1993). Free for all? Lessons from the RAND Health Insurance Experiment. Harvard University Press. *https://www.rand.org/pubs/commercial_books/CB199.html* **(New Mexico)**

PROVIDER BEHAVIOR

SENSITIVITY TO PAYMENT CHANGES

- Boccuti, C. (2016). "Paying a Visit to the Doctor: Current Financial Protections for Medicare Patients When Receiving Physician Services." Kaiser Family Foundation. *www.kff.org/medicare/issue-brief/paying-a-visit-to-the-doctor-current-financial-protections-for-medicare-patients-when-receiving-physician-services* **(CBO)**
- Curto, V. et. al. "Health Care Spending and Utilization in Public and Private Medicare," American Economic Journal: Applied Economics. *http://dx.doi.org/10.1257/app.20170295.* **(CBO)**
- Haber, S. et al., (2018). Evaluation of the Maryland All-Payer Model Third Annual Report. Centers for Medicare & Medicaid Services. *https://downloads.cms.gov/files/cmmi/md-all-payer-thirdannrpt.pdf* **(New Mexico)**
- Johnson, E.M. (2014) "Physician-Induced Demand," Encyclopedia of Health Economics, Volume 3, pp. 77 – 82. **(California)**

SENSITIVITY TO PATIENT DEMAND

- Kondo, Ayako, and Hitoshi Shigeoka (2013). "Effects of Universal Health Insurance on Health Care Utilization, and Supply-Side Responses: Evidence From Japan," Journal of Public Economics. *https://doi.org/10.1016/j.jpubeco.2012.12.004.* **(CBO)**
- Wishner, J. B. and Burton, R.A. (2017). How Have Providers Responded to the Increased Demand for Health Care Under the Affordable Care Act? Urban Institute. *www.urban.org/research/publication/how-have-providers-responded-increased-demand-health-care-under-affordable-care-act* **(CBO)**

OUTPUTS REPORTED

POPULATION HEALTH IMPACTS OR HEALTH OUTCOMES

- Allen, H., and Sommers, B.D. (2019). "Medicaid Expansion and Health: Assessing the Evidence After 5 Years," JAMA. *http://dx.doi.org/10.1001/jama.2019.12345* **(CBO)**
- Gordon, R. J. (2017). The rise and fall of American growth: The U.S. standard of living since the Civil War. Princeton University Press. **(Washington)**
- Gruber, J., and Sommers, B.D. (2019). The Affordable Care Act's Effects on Patients, Providers and the Economy: What We've Learned So Far. National Bureau of Economic Research. *www.nber.org/papers/w25932* **(CBO)**
- Guth, M. et. al. (2020). The Effects of Medicaid Expansion Under the ACA: Updated Findings From a Literature Review. Kaiser Family Foundation. *http://files.kff.org/attachment/Report-The-Effects-of-Medicaid-Expansion-under-the-ACA-Updated-Findings-from-a-Literature-Review.pdf* **(CBO)**
- Sommers, B.D. et. al. (2017). "Health Insurance Coverage and Health—What the Recent Evidence Tells Us," New England Journal of Medicine. *http://dx.doi.org/10.1056/NEJMsb1706645* **(CBO)**

FINANCING ASSUMPTIONS

EMPLOYER PAYROLL TAXES

- Colman, P. (2014) "Portrait of Oregon Businesses by Size of Firm," State of Oregon Employment Department. **(Oregon)**