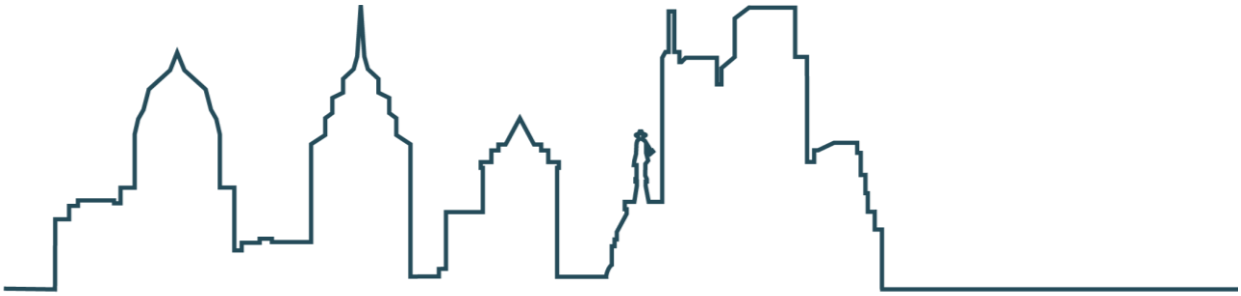
# The Fiscal Impacts of Insufficient Retirement Savings in Colorado

Date: February 2020
Submitted to: Colorado Secure Savings Plan Board



ESI ECONSULT SOLUTIONS INC.

economics | policy | strategy

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# Executive Summary

The Colorado Secure Savings Plan Board has commissioned Econsult Solutions, Inc. (ESI) to study the impact of insufficient retirement savings among Colorado's current and future retirees on the state's fiscal and economic position. This analysis demonstrates that the financial capacity of elderly households to maintain their living standards during their retirement years has significant impacts for the state's fiscal and economic health, in addition to the quality of life implications for its residents.

Colorado faces oncoming fiscal challenges due to the aging of the disproportionately large baby boomer generation. As this cohort ages, more residents will qualify for a variety of public assistance programs in place to provide needed services and support quality of life for seniors. Further, the elderly population is anticipated to grow as a share of the total population, meaning that each working age household will need to absorb a large share of the fiscal cost of these services.

On top of these demographic changes, the level of savings achieved by future retirees will dictate their annual available income in retirement. This in turn will impact their eligibility and benefit levels for many state funded programs, as well as the disposable income available to elderly households to circulate in the state economy, and the associated contribution to the state's tax base. This study seeks to isolate the impact from insufficient retirement savings, as reflected in annual income available to seniors, on Colorado's expenditures and revenues over the period spanning 2020-2035.

### Analytical Framework

Projections of the state's future population and household growth from the Colorado State Demographic Office form the basis for demographic change in this analysis. As depicted in Figure 1, Colorado's elderly (65+) population is anticipated to grow by 50 percent from 872,000 in 2020 to 1.31 million in 2035. During this period, the number of households headed by seniors ("elderly households") is projected to increase by 49 percent from 548,000 to 816,000 (see Figure 1).

As demonstrated in Figure 2, the elderly share of households is projected to grow from 23.6 percent in 2020 to 27.7 percent in 2035, while the share of the primary working age population is projected to shrink from 71.0 percent in 2020 to 67.7 percent in 2035. As a result of these changes, the "dependency ratio" represented by the number of working age households for each elderly household is projected to fall from 3.0 in 2020 to 2.4 in 2035.

Potential retirement savings levels are reflected in the development of two scenarios for the current and future income distribution of Colorado's elderly households:

- A "baseline" scenario under which retirement savings levels remain consistent with the current level (through a continuation of observed "replacement rates" of working-age income)
- An alternative "sufficient savings" scenario in which retirement savings are increased to recommended levels (relative to working age incomes)

The difference in expenditure and revenue impacts between these scenarios is defined as the fiscal impact attributable to insufficient savings in this analysis.

**Figure 1: Projected Growth in Colorado's Elderly Population and Households, 2020-2035**

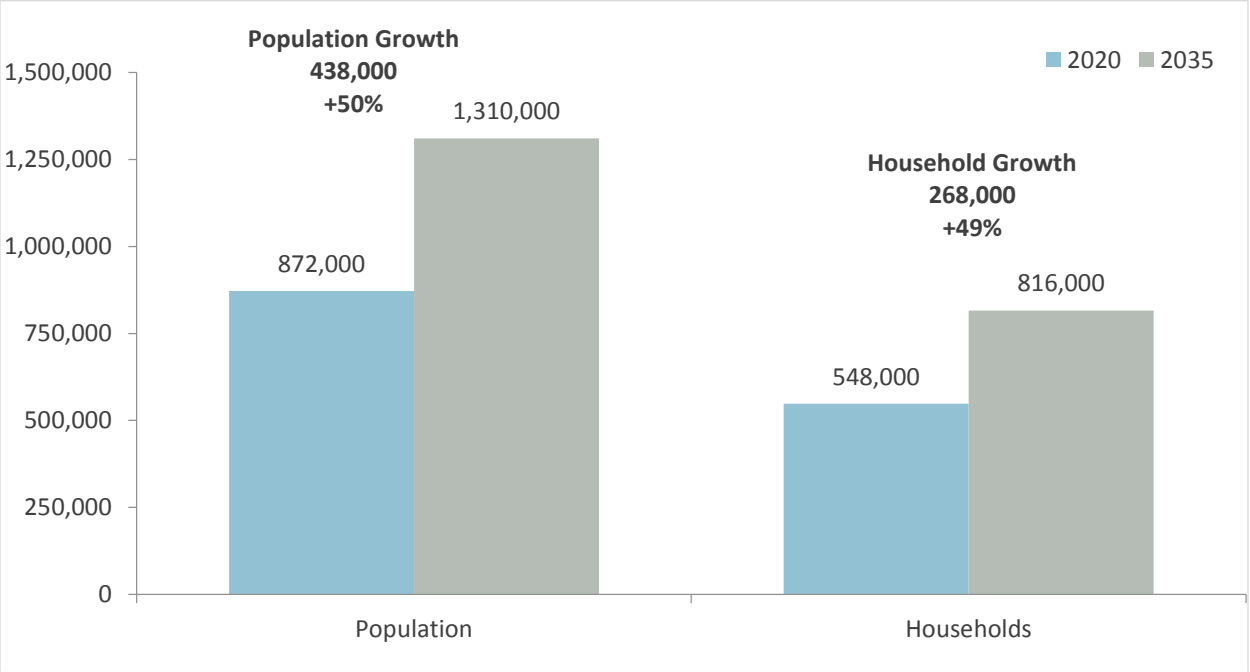
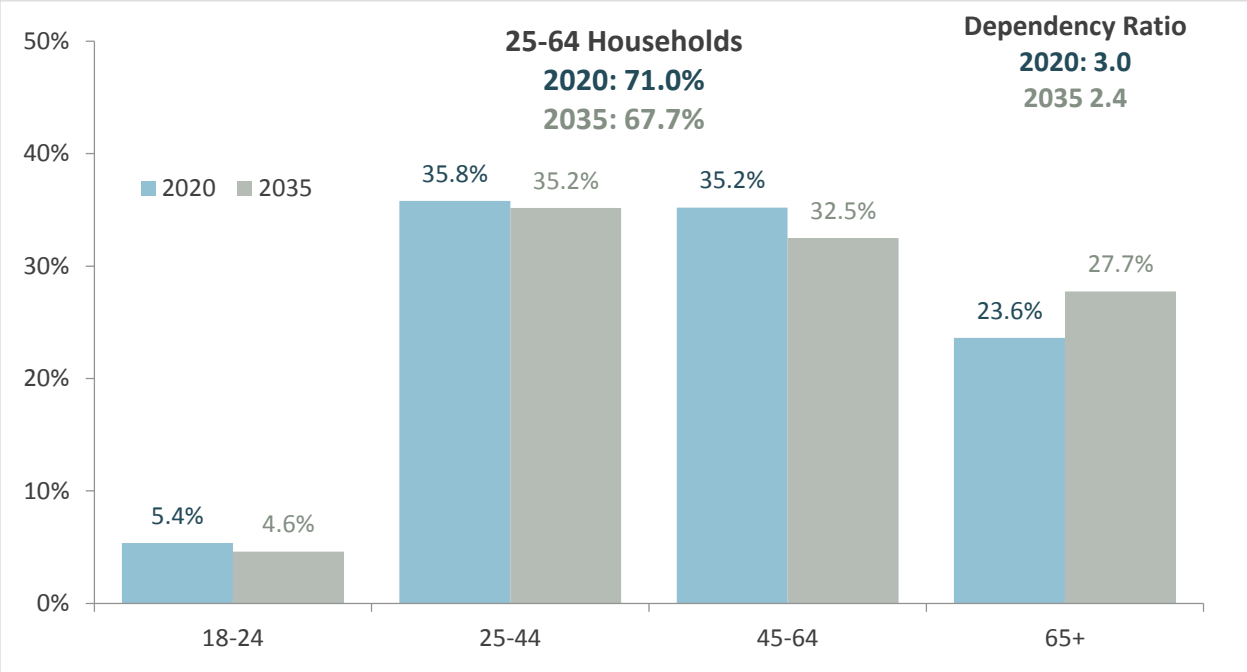



**Figure 2: Projected Elderly Share of Colorado Households, 2020-2035**




*Source: Colorado State Demography Office (2018)*

## Expenditure Impacts

Colorado operates a number of assistance programs for elderly residents which will face an increase in demand as the elderly population grows. In addition, many of these programs (such as Medicaid) are means-tested for eligibility and/or benefit levels, meaning that the level of income available to the state's elderly population has significant impacts on state and federal program costs.

This study identifies means-tested and senior-targeted programs that will be impacted by changing characteristics of the elderly population. State-funded expenditures on the elderly population are isolated from total expenditures for these programs. Anonymized participant data provided by the state and program eligibility requirements are used to model the proportion of state expenditures on elderly households within various income bands.

Program assistance costs are then matched to the demographic and income scenarios to produce estimates of state assistance costs over the period from 2020 to 2035 under the "baseline" and "sufficient savings" income scenarios (see Figure 3). Under the baseline scenario, state program assistance costs on the elderly population are estimated to grow from $1.26 billion in 2020 to $2.59 billion in 2035. Under the sufficient savings scenario, these costs are substantially lower, totaling $921 million in 2020 and rising to $1.81 billion in 2025. The net differential in state costs between scenarios represents the incremental state spending attributable to insufficient savings, when holding constant the level of services or benefits for each household at a given income level.

**Figure 3: State Expenditures on Senior Population by Scenario, 2020-2035 ($2020)**

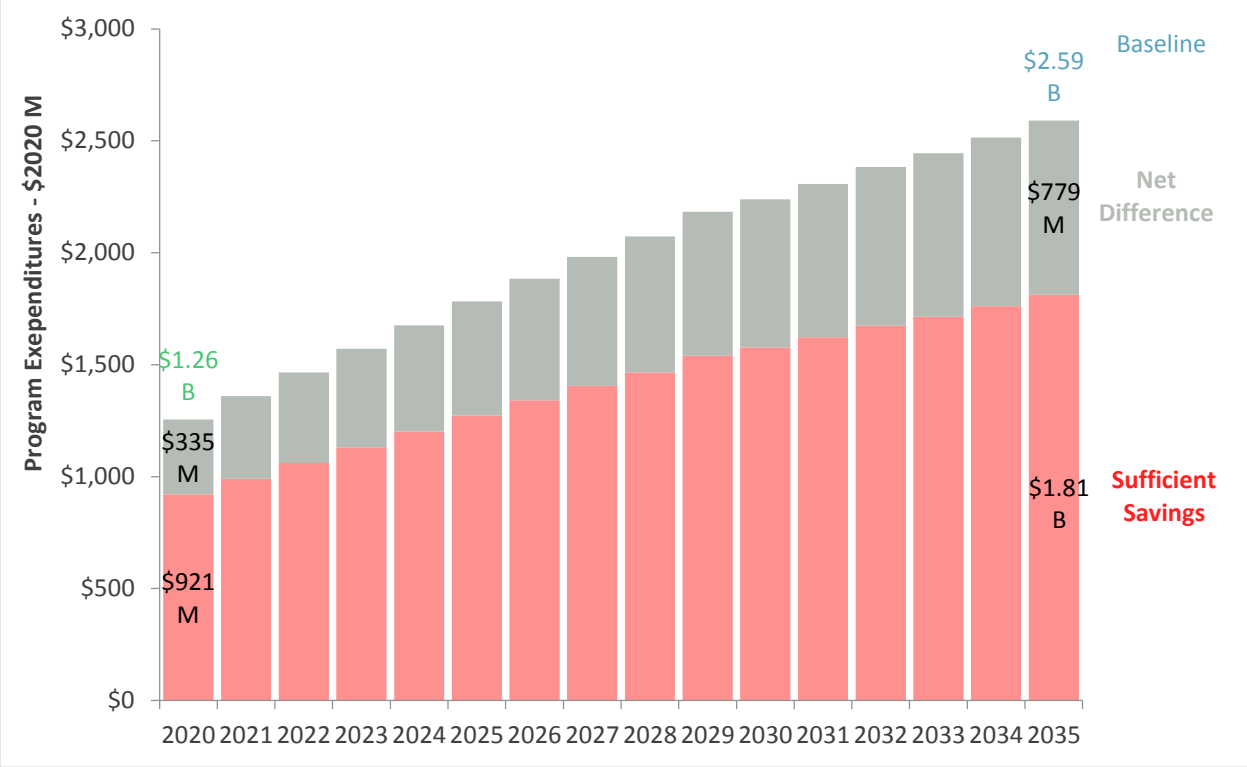
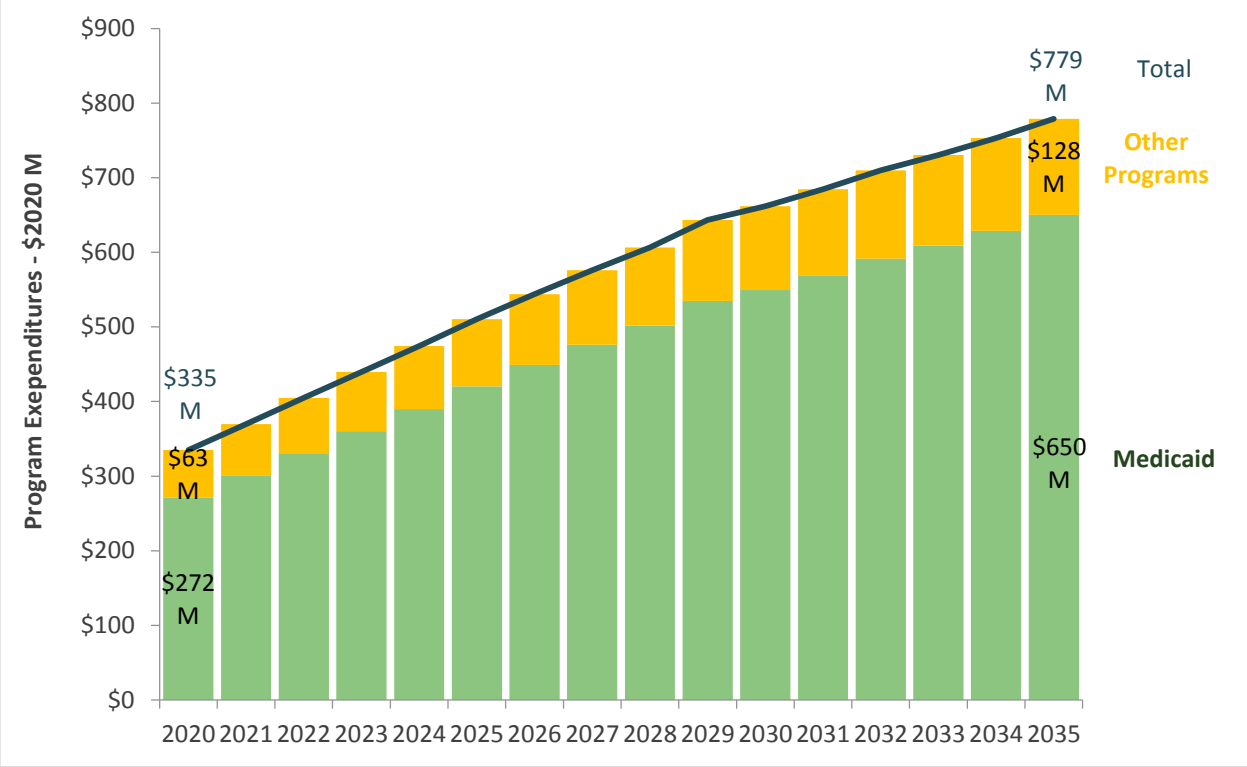


Figure 4 depicts the annual incremental state spending attributable to insufficient savings over the time period, including the breakdown of expenditures on Medicaid programs versus other assistance programs. Expenditures for Medicaid programs constitute the majority of state program costs from insufficient savings, representing $272 million of the estimated $335 in additional state costs due to insufficient savings in 2035. This differential is projected to grow to $779 million by 2035 and to total $8.89 billion across the fifteen year period from 2021-2035.

**Figure 4: State Program Costs Impacts from Insufficient Savings, 2020-2035 ($2020)**




While this analysis focuses primarily on impacts at the state level, a number of the identified programs are funded by a combination of state and federal funds. For these programs, the state funding analysis undertaken above is extrapolated to estimate the differential in federal program costs between scenarios. Federal costs for these identified programs due to insufficient savings among Colorado's elderly households are estimated at $299 million in 2020. This figure is projected to grow to $718 million by 2035 and to total $8.12 billion across the fifteen year period from 2021-2035 (see Figure 5).

**Figure 5: Federal Program Costs due to Insufficient Savings, 2020-2035 ($2020)**

| Program Type | 2020 | 2035 | Cumulative |
|---|---|---|---|
| Medicaid Programs | $288 M | $699 M | $7.89 billion |
| Other Assistance Programs | $11 M | $19 M | $230 million |
| **Total** | **$299 million** | **$718 million** | **$8.12 billion** |

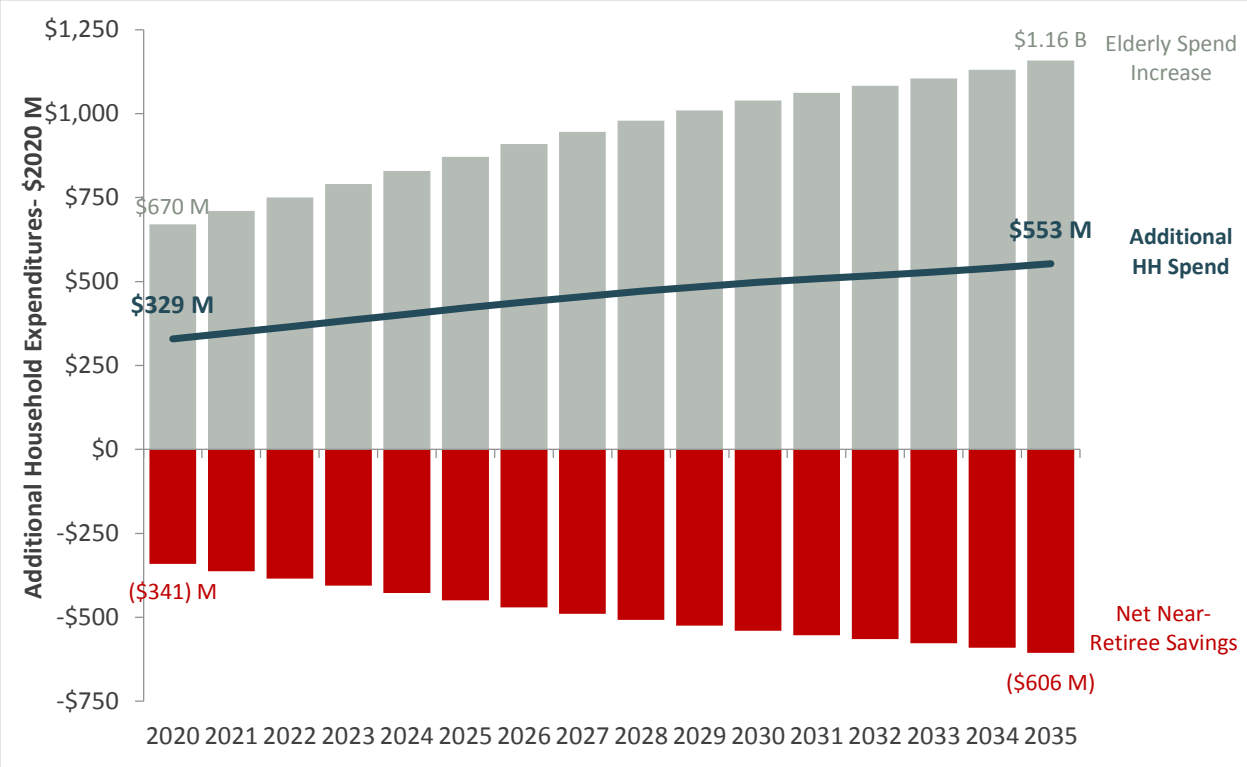
## Revenue Impacts

The income level of Colorado's elderly households also impacts their level of spending on a variety of goods and services each year. Differentials in household spending have ripple effects throughout the economy, impacting the level of economic activity and employment statewide. This activity in turn impacts tax revenue collections for the state and other jurisdictions.

Household spending impacts were modeled by first generating spending profiles for elderly households based on analysis of data from the Consumption and Activities Mail Survey. These household spending profiles for 2020 and 2035 are then matched to the demographic and income scenarios to generate estimates of direct spending by elderly households over the 15-year period under the baseline and sufficient savings scenarios. In the sufficient savings scenarios, an adjustment is undertaken to account for the dampening effect on household spending of additional savings by near-retiree households required to generate the recommended level of additional income in retirement under standard investment and accumulation assumptions.

The net difference in household spending between the two scenarios represents the additional household spending attributable to the modeled increase in retirement savings. Figure 6 depicts this additional spending by elderly households due to increased savings out to 2035, yielding a cumulative net increase in spending of $6.91 billion over the fifteen year period from 2021-2035.

**Figure 6: Net Additional Spending due to Increased Savings, 2020-2035 ($2020)**



This incremental household spending has ripple effects throughout the economy. Economic modeling using the IMPLAN input-output modeling framework is undertaken to estimate the total impact of household spending differentials on the Colorado economy, inclusive of spillover effects. The cumulative economic impacts from household spending are estimated to total $9.06 billion within the Colorado economy over the fifteen-year period from 2021-2035. This activity support more than 76,000 jobs years of employment (or 5,080 FTE jobs per year) with $3 billion in earnings (see Figure 7).

**Figure 7: Economic Impact from Household Spending with Increased Retirement Savings**

| Impact Type | 2020 | 2035 | Cumulative |
|---|---|---|---|
| Direct Output ($M) | $218 | $363 | $4.55 billion |
| Indirect & Induced Output ($M) | $213 | $361 | $4.51 billion |
| **Total Impact** | **$431 million** | **$724 million** | **$9.06 billion** |
| **Employment (FTE)** | **3,570 jobs** | **6,130 jobs** | **76,160 job-years** |
| **Employee Compensation** | **$141 million** | **$241 million** | **$3.00 billion** |

The additional economic activity and income under the sufficient savings scenario also contributes to the tax base of the state and other jurisdictions. Additional household income and associated spending translate to state revenue directly through the personal income tax, and through the sales tax and liquid fuels tax on direct purchases. In addition, the downstream activity in the state economy from incremental household spending result in additional personal income tax, corporate income tax and sales and use tax collections by the state.

The tax impacts from direct and downstream activity are modeled under the demographic and income scenarios, with the net difference between the baseline and sufficient savings scenarios representing state revenue impacts from insufficient savings. State revenue impacts to the state from these four tax types are estimated at $35 million in 2020. This figure is projected to grow to $60 million by 2035 and to total $742 million over the fifteen year period from 2021-2035 (see Figure 8).

**Figure 8: State Revenue Impacts with Increased Retirement Savings ($2020)**

| Tax Type | 2020 | 2035 | Cumulative |
|---|---|---|---|
| Personal Income Tax ($M) | $31.3 | $54.7 | $676 million |
| Sales and Use Tax ($M) | $2.7 | $4.3 | $54 million |
| Corporate Income Tax ($M) | $0.4 | $0.7 | $8 million |
| Motor Fuels Tax ($M) | $0.1 | $0.2 | $3 million |
| **Total State Tax ($M)** | **$35 million** | **$60 million** | **$742 million** |

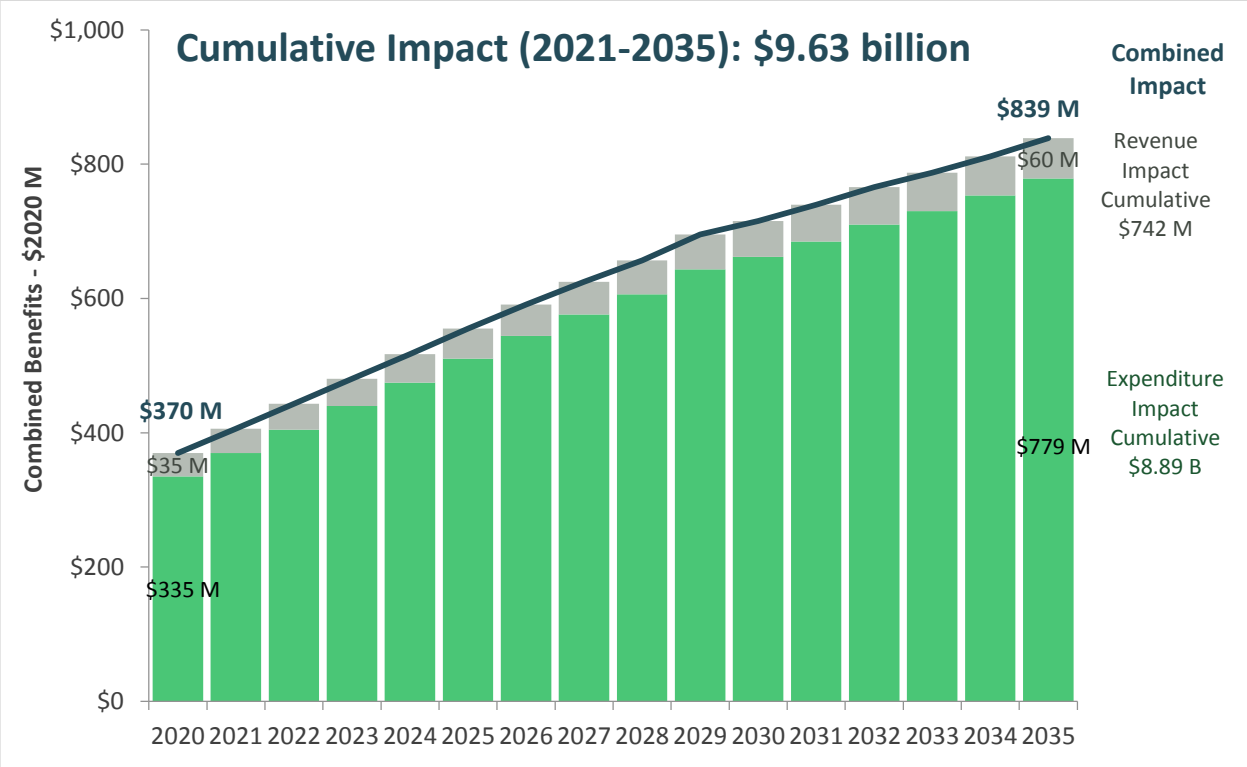
## Combined Fiscal Impacts

The net fiscal impact of insufficient retiree savings is composed of both the increased expenditures on assistance programs and foregone tax revenues that are associated with insufficient savings and associated lower income and expenditure levels of elderly Coloradans. To quantify this combined fiscal impact, the net expenditure and revenue impacts between the baseline and sufficient savings scenarios outlined above are aggregated.

It is estimated that in 2020, insufficient retiree savings levels are associated with a total fiscal impact to the state of $370 million. The majority of the fiscal impact to the state ($335 million) is the result of the increased program expenditures associated with insufficient savings, with the remaining $35 million attributable to foregone revenues. This combined fiscal impact is projected to rise to $839 million 2035, comprised of $779 million in expenditure impacts and $60 million in revenue impacts.

**The cumulative fiscal impact to the state from insufficient retiree savings is estimated at $9.63 billion over the fifteen year period from 2021-2035** (see Figure 9).

**Figure 9: State Fiscal Impacts from Insufficient Savings, 2020-2035 ($2020)**



Federal expenditure and tax revenue impacts from the modeled programs and economic impacts within Colorado are also aggregated to quantify the combined fiscal impact of insufficient retirement savings at the federal level. The estimated federal program expenditures on the identified assistance programs and foregone federal tax revenues from differentials in income and economic activity within Colorado associated with insufficient retiree savings levels and are summarized in Figure 10.

It is estimated that in 2020, insufficient retirement savings levels of Coloradans are associated with a total federal fiscal impact of $338 million, $299 million of which is attributable to assistance program costs. This combined federal fiscal impact rises to $784 million by 2035, of which $718 million is attributable to program cost impacts.

The cumulative fiscal impact to the federal government due to insufficient retirement savings levels of elderly Coloradans is estimated at nearly$9 billion over the fifteen year period from 2021-2035 (see Figure 10).

**Figure 10: Federal Fiscal Impacts from Insufficient Savings, 2020-2035 ($2020)**

| Federal Impact Type | 2020 | 2035 | Cumulative |
|---|---|---|---|
| Program Expenditure Impact | $299 million | $718 million | $8.12 billion |
| Revenue Impact | $39 million | $66 million | $824 million |
| **Total State Tax ($M)** | **$338 million** | **$784 million** | **$8.95 billion** |

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# About Econsult Solutions, Inc.

This report was produced by Econsult Solutions, Inc. ("ESI"). ESI is a Philadelphia-based economic consulting firm that provides businesses and public policy makers with economic consulting services in urban economics, real estate economics, transportation, public infrastructure, development, public policy and finance, community and neighborhood development, planning, as well as expert witness services for litigation support. Its principals are nationally recognized experts in urban development, real estate, government and public policy, planning, transportation, non-profit management, business strategy and administration, as well as litigation and commercial damages. Staff members have outstanding professional and academic credentials, including active positions at the university level, wide experience at the highest levels of the public policy process and extensive consulting experience.

# 1. Introduction and Study Parameters

This report, commissioned by the Colorado Secure Savings Plan Board and undertaken by Econsult Solutions, Inc. (ESI), details the connection between the retirement savings level of the Colorado's future retirees and the state's fiscal and economic position.

The financial capacity of elderly households to maintain their living standards during their retirement years has significant quality of life implications for Colorado residents. Further, the issue has significant impacts for the state's fiscal and economic health.

Like most states and the federal government, Colorado faces oncoming fiscal challenges due to the aging of the disproportionately large baby boomer generation. As this cohort ages, more residents will qualify for a variety of public assistance programs in place to provide needed services and support quality of life for seniors. Further, the elderly population is anticipated to grow as a share of the total population, meaning that each working age household will need to absorb a large share of the fiscal cost of these services.

On top of these demographic changes, the level of savings achieved by future retirees will dictate their level of income available in retirement. This in turn will determine their eligibility and benefit levels for many state funded programs, as well as the disposable income that elderly households have to circulate in the state economy. This study seeks to isolate the impact from insufficient retirement savings, as reflected in annual income available to seniors, on Colorado's expenditures and revenues over the period from 2020-2035.

## 1.1. Analytical Approach

This section provides a high-level overview of the approach used in this analysis to quantify the connection between retiree savings and state fiscal impacts. Each subsequent section of the report will provide further methodology detail on the calculations undertaken for each component of the analysis.

### Organization of Report

This analysis quantifies two broad categories of public impacts from insufficient savings for elderly Coloradans: expenditures and revenues. The report is organized as follows:

**Study Parameters (Section 1)**

Section 1 sets forth the framework for the analysis, defines projections of demographic change, and defines the level of insufficient savings utilized in the analysis. Potential savings levels are reflected in the development of two scenarios for the current and future income distribution of Colorado's elderly households: a "baseline" scenario under which Coloradans' retirement savings levels remain consistent, and an alternative "sufficient savings" scenario in which retirement savings are increased to recommended levels. The difference in expenditure and revenue impacts between these scenarios represents the fiscal impact attributable to insufficient savings in this analysis.

**Expenditure Impacts (Section 2)**

State funding supports programs for elderly residents which will increase in demand as the elderly population grows. In addition, many of these programs like medical services under Medicaid are means-tested for eligibility and/or benefit levels, meaning that the level of income available to the state's elderly population has significant impacts on state and federal program costs.

**Revenue Impacts (Section 3)**

The income level of elderly households also impacts their level of spending on a variety of goods and services each year. Differentials in household spending have ripple effects throughout the economy, impacting the levels activity and employment statewide. This activity in turn impacts tax revenue collections for the state and other jurisdictions.

**Summary of Impacts (Section 4)**

Expenditure and revenue impacts both bear on the fiscal position of the state and other jurisdictions. This chapter combines and aggregates these impacts over the fifteen year analysis period.

## Key Parameters and Data Sources

The time horizon for this analysis is a 15-year period from 2020 to 2035. Throughout this report, results are expressed at the start (2020) and end (2035) points of the analysis period. Where cumulative results are expressed in this report, they represent the 15-year period from 2021 to 2035. All results are expressed in common dollar terms ($2020) for appropriate comparison and aggregation of results. Within this approach, inflation in incomes, purchasing power and costs are all considered equivalent, with the exception of anticipated excess inflation in medical costs, which is accounted for above and beyond standard inflation.

Income scenarios developed within the report should be understood as a mathematical benchmark of an increase in savings levels that allows for analysis of the differential effect on the state's economy and fiscal position. This analysis does not represent that this scenario represents the ideal level of savings for any household or for the state's households collectively, nor does it evaluate the effect of any specific policy intervention on achieving a particular level of retirement income.

Assistance program structures, eligibility and demand at a given level of income are assumed to be held constant over the analysis period. Notably, Colorado has unique budgetary parameters due to the Taxpayer's Bill of Rights (TABOR) approved by voters in 1992. TABOR limits annual state revenue growth to inflation and population growth, with the remaining revenue generated by economic growth refunded to local governments. This framework is not applied directly as a constraint to state revenue or expenditure projections within this analysis, though within this context, fiscal results in this analysis should be understood to have potential implications for funding available for other state priorities.

Finally, this analysis presents the potential economic impact on the Colorado economy and on programs that are fully or partially funded at the state level. A comprehensive review of federal impacts is beyond the scope of this study; however federal impacts are calculated for programs in which expenditures are shared between the state and federal government. Similarly, tax revenue estimates for federal and local jurisdictions from additional economic activity are shown where they can be reliably estimated.

Several terms are used throughout the report to address the methodology. In order to clarify the calculations, consistent terms for individuals, households, goods, and costs are necessary. Figure 1.1 defines the terms and data sets used (and referenced frequently) throughout the report.

Figure 1.1: Key Terms and Data Sources

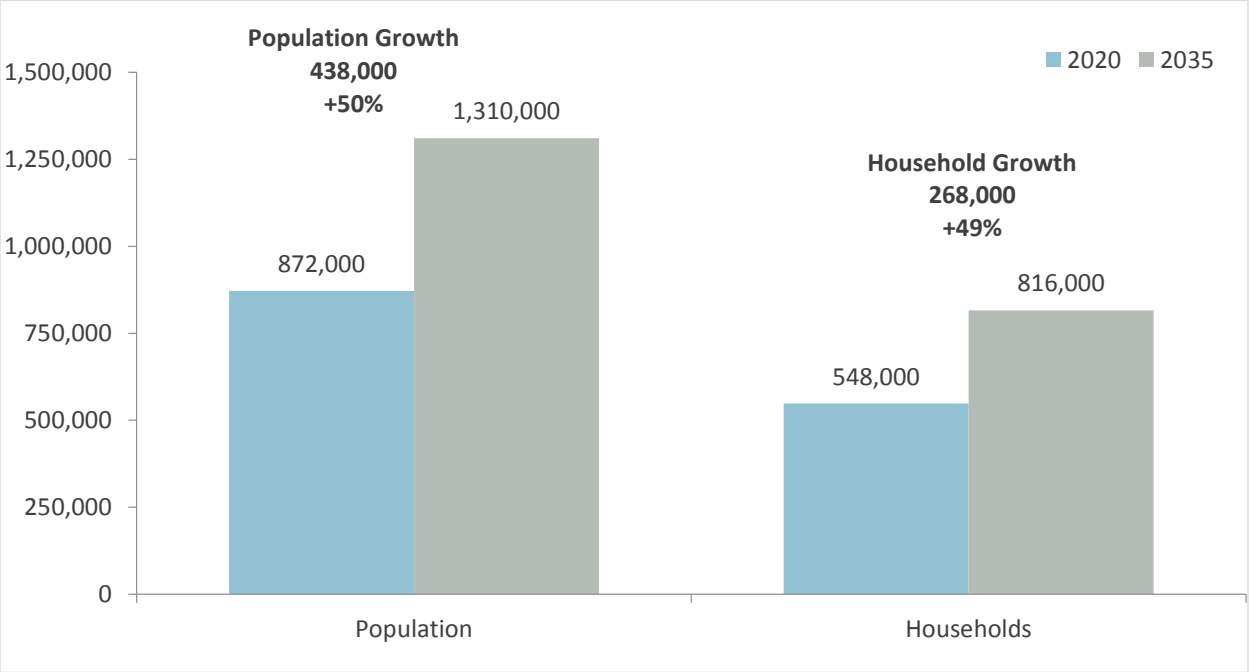
| Term | Definition |
|---|---|
| **Population** | |
| Elderly | Individuals aged 65 and older (note that not all retirees are elderly, and not all elderly residents are retirees) |
| Near-retiree | Individuals aged 50-64 |
| Dependency ratio | The ratio within a population of individuals of typical working age (18-64) to those above and below that age range (children and elderly) |
| **Income** | |
| Replacement rate | The proportion of preretirement income recommended to maintain a similar standard of living during retirement (defined as 75% within this report) |
| Federal Poverty Level (FPL) | The federally-defined maximum annual household income that constitutes a household in poverty; based on the Federal Poverty Income Guidelines (FPIG) issued by the U.S. Department of Health and Human Services. Set at $12,490 for a one-person household and $16,910 for a two-person household (and higher for larger households) for 2019 |
| Baseline | The observed income distribution, assistance cost and household spending for elderly residents in 2020, and the projected income distribution, assistance cost and household spending for elderly residents in 2035 based on the continuation of current trends |
| Sufficient savings | For purposes of modeling income distribution, “sufficient savings” are savings that provide elderly individuals with an annual household income that is at least 75% of their working age (50-64) annual income, with a minimum of the Federal Poverty Level; and in aggregate, this term describes income distribution, assistance costs and household spending for elderly residents in a scenario in which all elderly residents have achieved this income benchmark |
| Insufficient savings | “Insufficient savings” are defined as savings that provide elderly individuals with less than the targeted annual retirement income levels described above |
| Net | The differential in calculated outcomes (state assistance costs, household spending, economic, and tax revenue impact) between the baseline and sufficient savings scenarios (i.e. attributable to insufficient savings) |
| **Key Data Sources** | |
| CAMS | The Consumption and Activities Mail Survey (part of the longitudinal University of Michigan Health and Retirement Study (HRS)) is used to estimate household spending patterns for elderly households |
| CPI | The Consumer Price Indices (calculated by the Bureau of Labor Statistics (BLS)) provides information on inflation level across the economy (though CPI-U, the index for all urban consumers) and for specific sectors (such as CPI-Medical, the index for medical care) |
| CPS | The Current Population Survey (conducted by the U.S. Census Bureau) provides information on income patterns for elderly and near-retiree Coloradans |

## 1.2. Demographic Change Projection

Colorado's elderly population is anticipated to increase rapidly over the next 15 years with the continued aging of the baby boomer generation. In 2018, the Colorado State Demography Office issued projections of the state's future population and household growth, including projections by age bracket. These projections for 2020 and 2035 serve as the basis for demographic change in this analysis.

From 2020 to 2015, Colorado's elderly (65+) population is anticipated to grow by 50 percent, from 872,000 in 2020 to 1.31 million in 2035. During this same period, the number of households headed by seniors ("elderly households") is projected to increase by 49 percent, from 548,000 to 816,000 (see Figure 1.2).

Figure 1.2: Projected Growth in Colorado Elderly Population and Households, 2020-2035




*Source: Colorado State Demography Office (2018)*

Figure 1.3 below shows the elderly population and household projections as a share of the statewide total. Notably, elderly residents represent 14.9 percent of the population in 2020 (growing to 18.3% by 2035) but 23.6 percent of total households (see Figures 1.3 and 1.4).

The ratio of elderly residents to households implies an average household size of 1.6, far below the statewide average of 2.5, and consistent with the life cycle of senior households. This dynamic means that elderly residents represent a more significant portion of Colorado's households than its population, which is relevant from a fiscal standpoint since households often form the core unit for program eligibility as well as for private spending.

The elderly share of households is projected to grow from 23.6 percent in 2020 to 27.7percent percent in 2035, while the share of the primary working age population is projected to shrink from 71.0 percent

in 2020 to 67.7 percent in 2035. As a result of these changes, the "dependency ratio" represented by the number of working age households for each elderly household is projected to fall from 3.0 in 2020 to 2.4 in 2035. Notably, this ratio has already fallen significantly from 4.2 in 2010, as the first wave of baby boomers has crossed into retirement age.

Figure 1.3: Projected Colorado Population by Age Band, 2020-2035

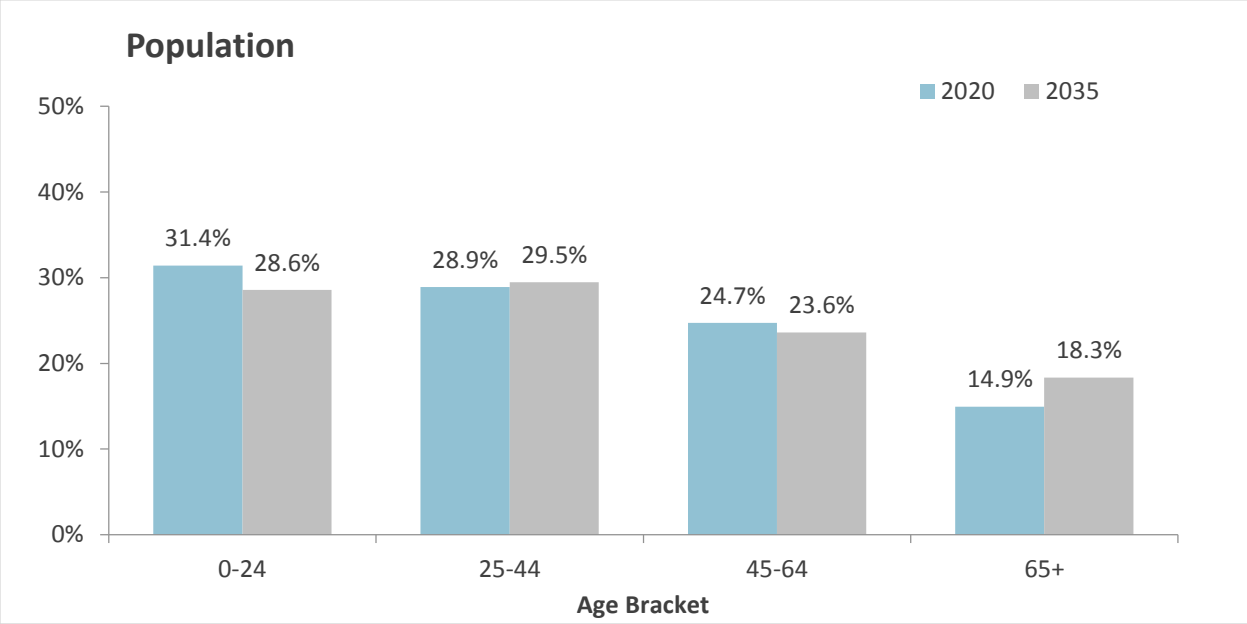
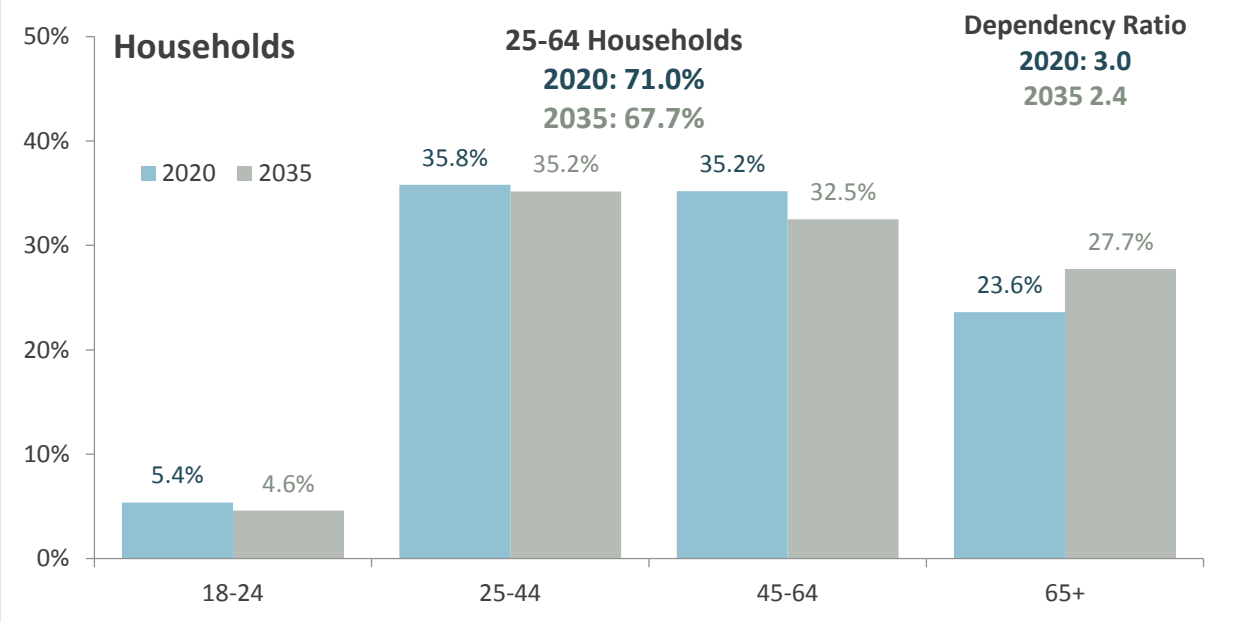


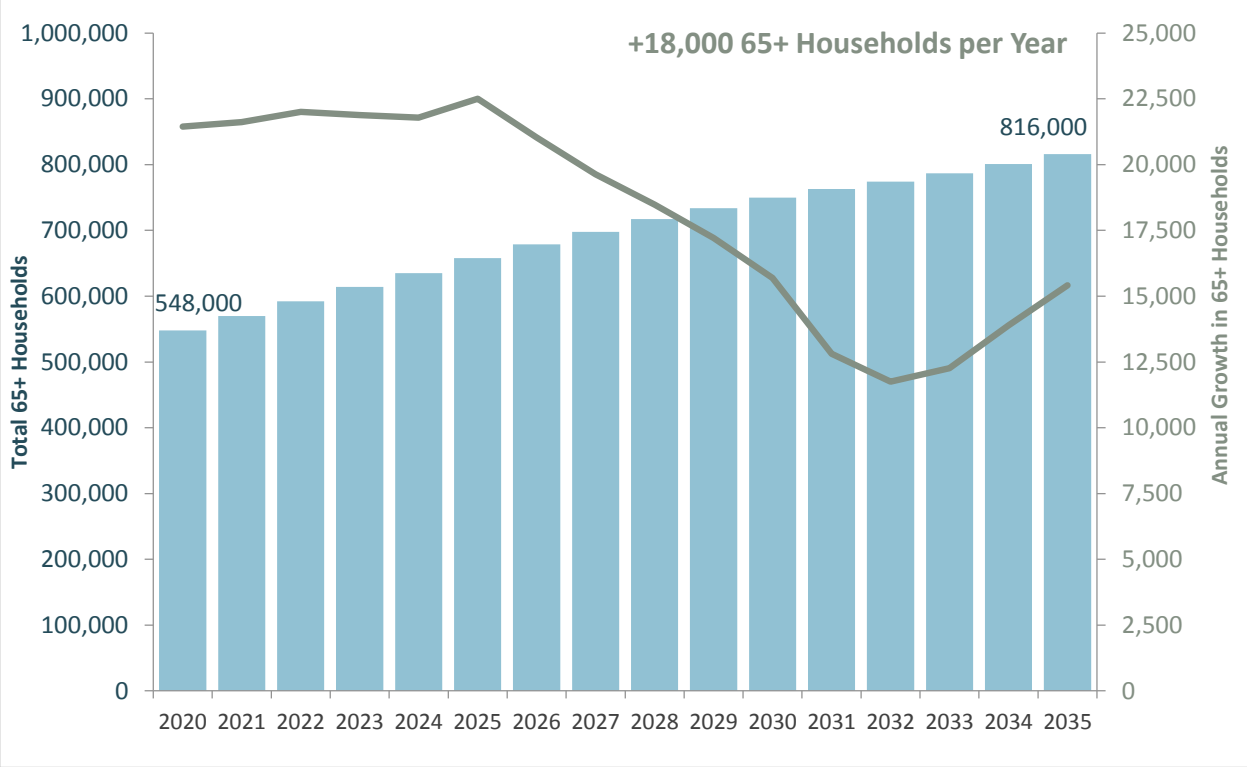

Figure 1.4: Projected Colorado Households by Age Band, 2020-2035




*Source: Colorado State Demography Office (2018)*

On an annual basis, these forecasts anticipate an increase of about 18,000 senior households per year between 2020 and 2035 (see Figure 1.5). Annual growth in the initial years (2020-2026) exceeds 20,000 per year, before slowing after the baby boomer cohort fully reaches retirement age. While annual growth in elderly households is expected to decelerate in the second half of the period, households added in the earlier years remain in the pool of elderly households through the rest of the period. Accordingly, this "front-loading" of growth creates additional fiscal challenges for the state.[1]

Figure 1.5: Project Annual Elderly Household Growth, 2020-2035




*Source: Colorado State Demography Office (2018)*

[1] Further, while this analysis does not extend beyond 2035 and does not make a distinction between different age groups within the 65+ households, the continued aging of the boomer generation in future decades to 75+ and 85+ age cohorts may create additional needs, with associated public assistance costs.

## 1.3. Defining Insufficient Savings

Estimating the fiscal impacts of insufficient savings requires developing a definition of savings sufficiency in order to understand how it differs from current conditions. This analysis advances a statistical standard for analytical purposes based on a "replacement rate" standard that compares annual incomes in retirement to working age incomes. This section develops this standard and applies it to create scenarios for the current and future income distribution of Colorado's elderly households.

The concept of sufficient wealth for retirement is the subject of considerable research and debate. Financial planners and retirement experts typically define the target for financial security in retirement years based on maintenance of the basic living standards enjoyed by households during their working years. This approach pegs the annual level of income available in retirement to the level of working age income, rather than defining a set dollar figure for each household irrespective of earnings.

This approach can be implemented either through a recommended lump sum savings amount relative to income (such as eight to ten times one's annual working age income level)[2] or a recommended percentage of annual working age income (such as 70-85 percent)[3] available each year in retirement. The proportional approach generally assumes that elderly households can maintain their living standards with less than 100 percent of their working age incomes, due to a reduced level of expenses, favorable tax treatment, and reduced need for savings during retirement years.

This analysis adopts an income replacement framework targeting 75 percent of working age income. Within this framework, the level of retirement savings is evaluated from the perspective of the annual income stream that it supports during retirement years, rather than their lump sum balance or net wealth. This annualized income framework provides a more comprehensive picture of the financial means of an elderly resident than a lump sum balance alone, since it accounts for ongoing income streams (such as Social Security).[4] This approach also allows for the evaluation of public assistance program eligibility and household spending, which together comprise the fiscal and economic implications of changes in household income.

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[2] See for example: Fidelity Viewpoints. "How much do I Need to save for Retirement? Savings factor: Aim to save at least 1x your income at 30, 3x at 40, 7x at 55, 10x at 67." Jun 5, 2017. <https://www.fidelity.com/viewpoints/retirement/how-much-money-do-i-need-to-retire>

[3] A 2016 study by the U.S. Government Accountability Office (GAO) "analyzed 59 articles and reports that discussed how to develop, calculate or evaluate replacement rates" and concluded that "target replacement rates cited in the articles and reports GAO reviewed typically range between 70 and 85 percent." GAO, "Better Information on Income Replacement Rates Needed to Help Workers Plan for Retirement." Mar 1, 2016. <https://www.gao.gov/products/GAO-16-242>

[4] The total annual income available to an elderly household is often a function of both ongoing revenue streams from funds maintained by third parties (such as annuities, or the previously mentioned Social Security and defined benefit plans) and drawdowns from directly owned funds (such as withdrawals from private savings accounts or distributions from 401(k)s and individual retirement accounts). Annual income can also include wages if an elderly individual continues to work. This analysis, which is based on the Current Population Survey (CPS) dataset, combines all of these components of retirement income, although it does not detail the income streams themselves, presenting instead a singular annualized income figure.

This standard is modeled through a "cohort matching" approach to estimate changes in the distribution of household incomes over time. The working age distribution is defined by the current or past incomes of "near-retiree" households between the ages of 50 and 64. The replacement rate standard of 75 percent is then applied to model the "sufficient" level of income for this cohort as it reaches retirement age (65+).

For the purpose of this analysis, adjustments are made to the replacement rate framework for households at the top and bottom of the income distribution. For lower-income residents, recommended replacements rates can yield income levels that may not be adequate to meet basic household needs. Accordingly, an "income floor" is applied to define the Federal Poverty Level (FPL) as the minimum household income level under the sufficient savings scenario.[5]

Conversely, upper income households that fail to achieve the recommended replacement rate may still have sufficient resources to live comfortably. In these cases, it may not be helpful to treat these savings levels as "insufficient" from a public policy standpoint. Accordingly, household incomes projected to be above $100,000 within the baseline scenario are considered "sufficient" within this analysis regardless of the replacement rate achieved.

In sum, sufficient income for elderly residents is defined as 75 percent of their annual working age (50-64) income or an annual income above $100,000, with a minimum retirement income of the Federal Poverty Level. The terms "sufficient savings" in this analysis refers to whatever level of savings will yield sufficient income for a household during retirement, per this standard. The term "insufficient savings" is used throughout this report to describe shortfalls in annual available income in retirement years relative to this target. The term "insufficient savings" rather than "insufficient income" is used in order to highlight the role of savings behavior during working years as a key determinant of the ability of individuals to achieve targeted income levels in retirement.

## Household Income Scenarios

This analysis presents two household income scenarios for Colorado's elderly population at the start (2020) and end points (2035) of the analysis period:

- A "baseline" scenario in which retirement savings behavior remains consistent with current levels (as reflected by a continuation of observed "replacement rates" of working-age income in retirement).[6]
- A "sufficient savings" scenario in which Colorado's current and future retiree households achieve recommended levels of retiree savings (as a function of their working age incomes).

[5] Note that this approach does not endorse the sufficiency of the FPL for elderly households to maintain adequate living standards. Nonetheless, this threshold represents a well-understood benchmark for the analytical purposes of this analysis.

[6] Notably, this "cohort matching" approach does not assume that every near-retiree household remains in Colorado during their retirement years or that no new households enter the state. Instead, prior effects of these inflows and outflows are incorporated by observing the overall characteristics of the cohort at two points in time.

The calculated differential in expenditure and revenue impacts between these scenarios represents the fiscal impact attributable to insufficient savings in this analysis.

### Current Income Distribution (Baseline)

Defining the "baseline" income scenarios begins with analysis of the current and past income levels of Colorado's elderly (65+) and near-retiree (50-64) households.

Income data for Colorado households is drawn from the Annual Social and Economic Supplement to the Current Population Survey (CPS). This survey is conducted by the U.S. Census Bureau and serves as the basis for the federal government's official poverty statistics. CPS data is aggregated on an annual basis and made available for custom analysis. Through this format, it is possible to isolate household income statistics within a particular state for a particular age cohort at a given point in time.

CPS household income data for Colorado's 65+ population from 2010-2017 was analyzed to provide for a sufficient sample size (nearly 3,000 observations). Two adjustments are made to these point-in-time observations to project household incomes as of 2020:

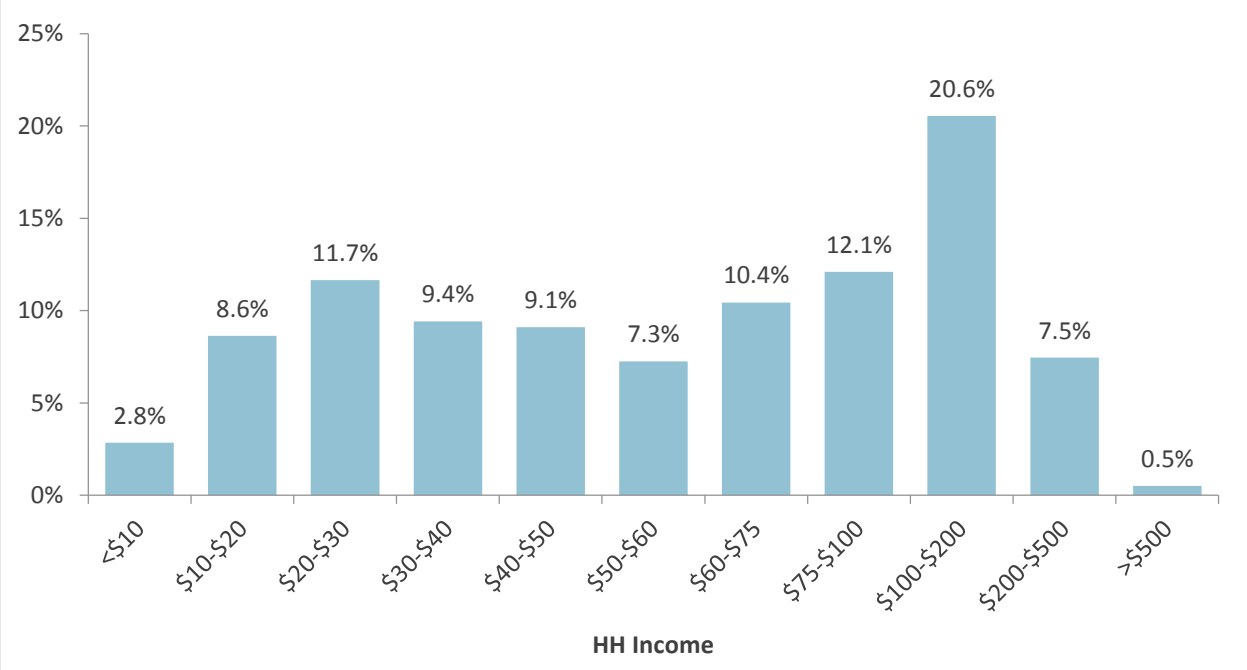
1) Incomes are adjusted for inflation into common dollar terms, and are expressed in $2020[7]; and
2) Incomes are adjusted for anticipated real growth through 2020 (above and beyond inflation).[8]

The estimated income distribution of Colorado's elderly households in 2020 based on this approach is shown in Figure 1.6. The median elderly household falls between $60,000 and $65,000 in income, and more than 70% of elderly households fall under $100,000 in annual income.

[7] Inflation adjustments are undertaken with the commonly used CPI-U price index from Bureau of Labor Statistics. This data is available through the first half of 2019, and is projected to 2020 by extrapolating forward the reported year over year change for the first half of 2019.

[8] This growth is estimated by calculating the annualized rate of growth in elderly incomes for Colorado residents between the 1994-2000 period and the 2010-2017 period in common dollar terms, and extrapolating forward that annualized real growth level to 2020.

Figure 1.6: Projected Income Distribution of Colorado 65+ Households - 2020




*Source: ESI analysis of CPS Data*

## Baseline Income Distribution - 2035

Next, incomes for elderly households are projected to 2035 under a "baseline" scenario in which retirement savings behavior remains consistent. This baseline scenario is developed by observing income replacement levels (using CPS data) for Colorado's near-retirees (ages 50-64) in 2000 and its elderly residents (65+) in 2015 (see Figure 1.7).[9] The changes in income observed for this cohort over the fifteen year period are then applied to the incomes of the current cohort of near retirees (50-64) as of 2020 to project the income distribution of the state's elderly population as of 2035 (see Figure 1.8).[10]

Notably, this approach to developing the baseline scenario does not assume that elderly incomes remain constant over the 2020-2035 period, but rather that the relationship between working-age and retirement income remains constant from the prior generation of retirees. Since Colorado's near-retiree households in 2020 are projected to have somewhat higher incomes (in inflation-adjusted terms) than the near-retiree households in 2000, this cohort is projected to have a higher level of income in retirement when holding savings behavior constant.

[9] Note that all results are expressed in consistent dollar terms ($2020), meaning that differentials reflect changes in real purchasing power.

[10] Modeling is undertaken by estimating replacement rates achieved by near-retiree households from 2000 to 2015 for each percentile across the income distribution. These rates are then applied the new distribution of near-retiree income estimated for 2020. For the purpose of analysis, households are aggregated into income bands based on CPS data, and then an even distribution of incomes is assumed within each band in order to model a smooth distribution of resulting incomes through the replacement rate approach.

Figure 1.7: Income Distribution of Colorado Near-Retiree (50-64) Households in 2000 and Elderly Households (65+) in 2015 (in $2020)

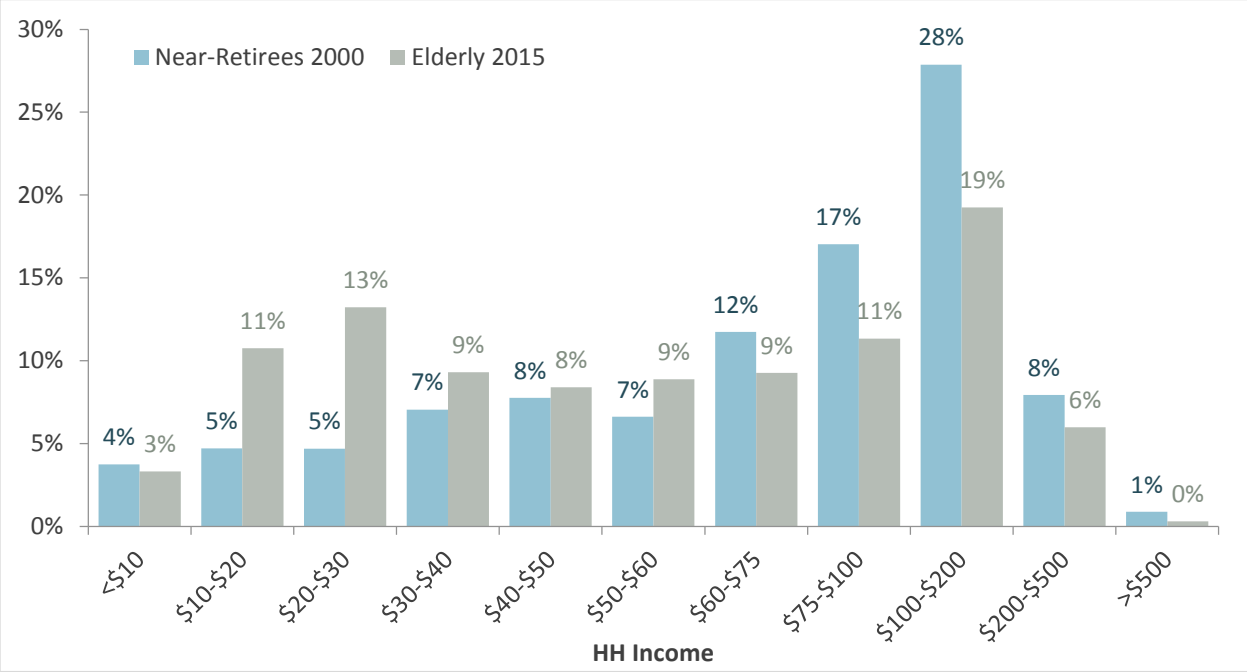
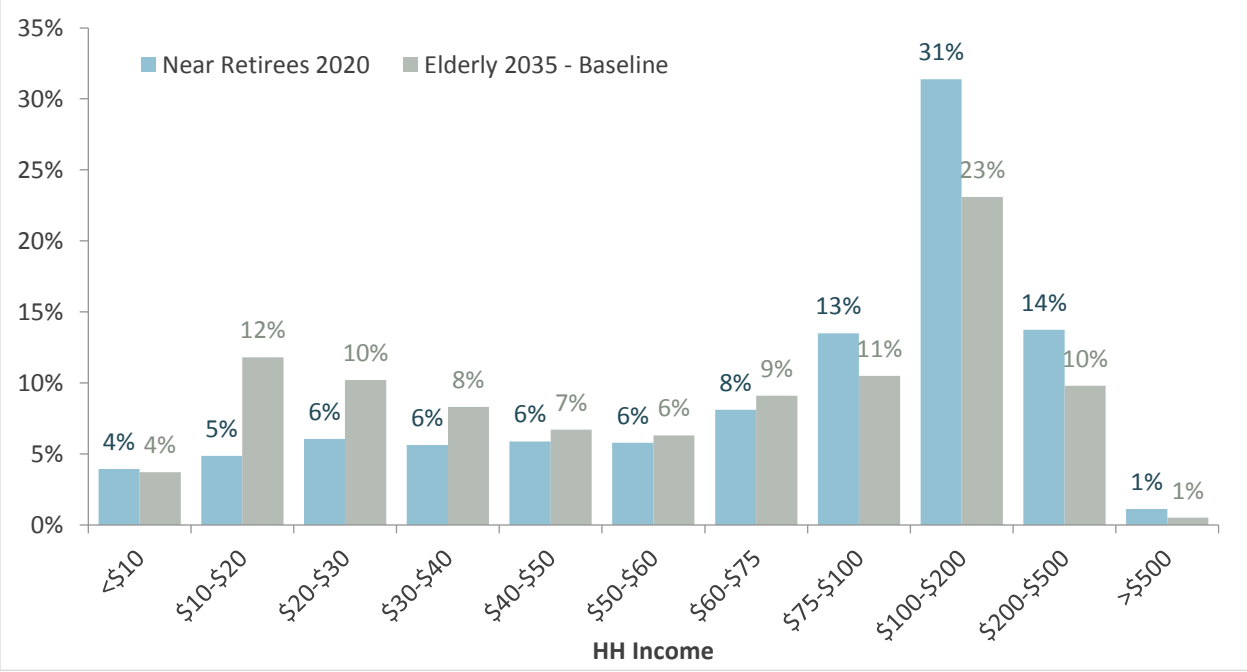



Figure 1.8: Income Distribution of Elderly Households in 2035 – Baseline Scenario (in $2020)




*Source: ESI Modeling of CPS Data*

## Sufficient Savings Income Distribution: 2020 & 2035

Next, an alternative scenario is developed in which Colorado's elderly households meet the generally recommended levels of retirement savings as reflected by "income replacement" standards in 2020 and 2035.

As reviewed above, the "sufficient savings" income scenario is defined by elderly households achieving a targeted 75 percent level of income replacement of their working age (50-64) income level. Adjustments are made to this replacement rate framework for lower-income households, with the minimum targeted elderly income set to the Federal Poverty Level (FPL), and for upper-income households, with baseline replacement levels projected for households above $100,000 considered to be "sufficient."

This approach is used to model an alternative income distribution for Colorado's elderly households in 2020 based on near-retiree incomes in 2005 (see Figure 1.9).[11] Next, it is used to develop a future income distribution for Colorado's elderly households in 2035 based on near-retiree incomes in 2020 (see Figure 1.10).

[11] The income distribution of near-retiree households in 2005 is modeled by applying a growth rate to the near-retiree incomes estimated for 2000 based on CPS data. This growth rate is based on real annual growth in incomes for this cohort observed between 2000 and 2015. As with the baseline scenarios, near-retiree households are assumed to be distributed evenly within each income band. A replacement rate of 75% is then applied to each household in the income distributions, with adjustments as described above for households whose resulting income falls below the FPL or above $100,000. The same process is then applied to near-retiree incomes as of 2020 to model the income distribution of elderly households under the sufficient savings scenario for 2035.

Figure 1.9: Income Distribution of Elderly Households – Sufficient Savings Scenario (2020) ($2020)

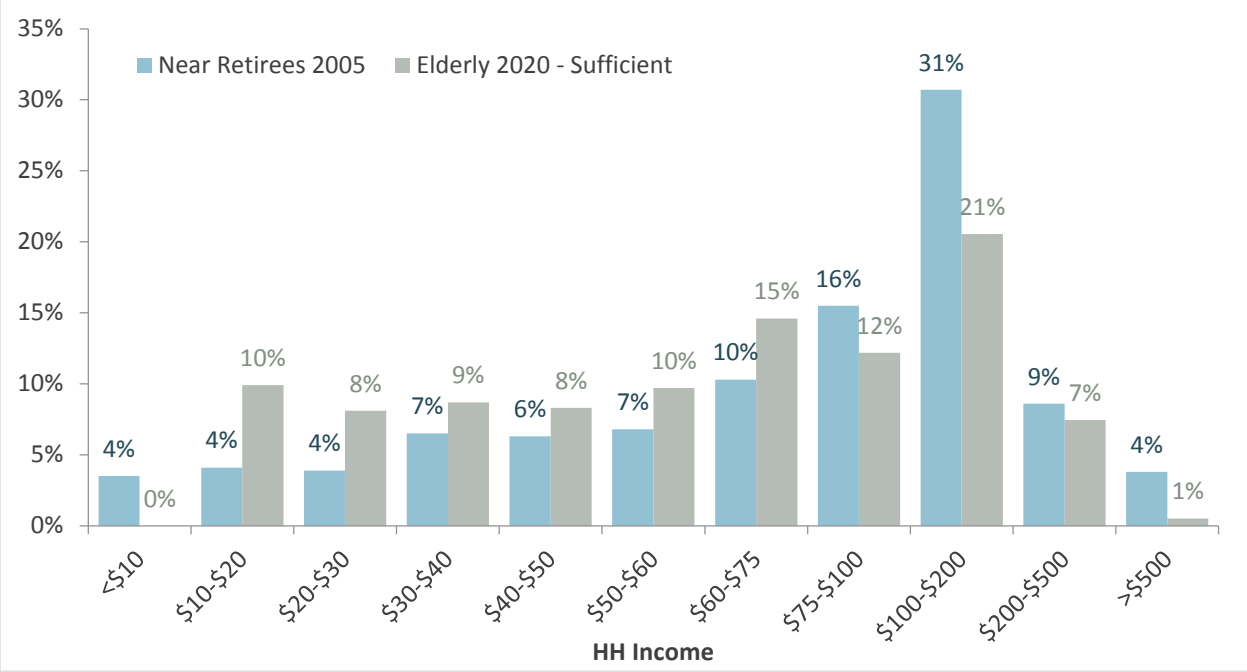
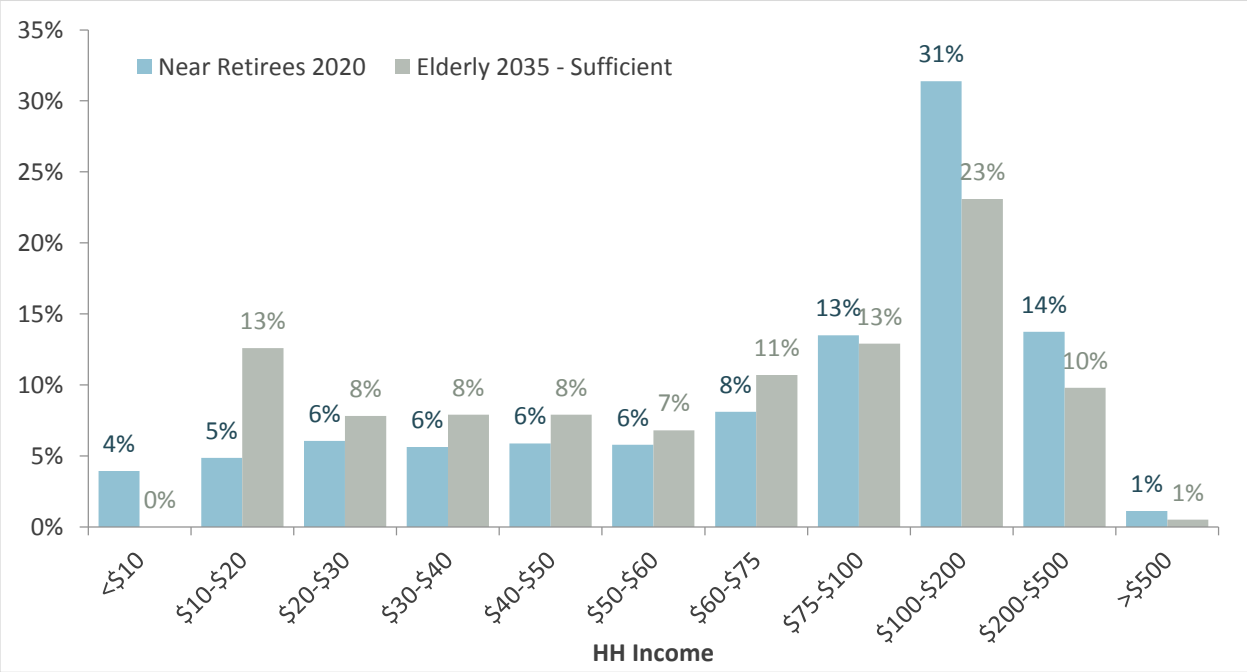



Figure 1.10: Income Distribution of Elderly Households – Sufficient Savings Scenario (2035) ($2020)




*Source: ESI Modeling of CPS Data*

## Baseline and Sufficient Savings Scenarios: Differential

The differential in the incomes of elderly households between the baseline and sufficient savings scenarios represents the modeled change from increased savings utilized in this analysis. This differential between scenarios equates to an average gap of around $5,100 in annual income for households with less than $100,000 in 2020, and a gap of around $4,600 for households with less than $100,000 in 2035.[12] Households with incomes above $100,000 are treated equivalently in each scenario.

Figure 1.11 and Figure 1.12 illustrate this differential for the 2020 and 2035 scenarios in terms of the cumulative distribution (showing the proportion of households that have at least the given level of household income in each band. The gray wedge in these figures represents the differential in incomes for elderly households between the baseline and sufficient savings scenario. This differential forms the basis of the statistical analysis of the expenditure and revenue impacts of insufficient savings in the sections that follow.

[12] Since replacement rates in the baseline scenario are held constant by definition, the slight decrease in average income gap between scenarios is a product of the higher starting incomes of the near-retiree cohort in 2020 relative to the near-retirees in 2005. Due to this differential, a greater share of the projected elderly population in 2035 exceeds the $100,000 threshold, and therefore is not modeled to have any gap between baseline and sufficient incomes.

Figure 1.11: Cumulative Income Distribution of Elderly Households by Scenario – 2020

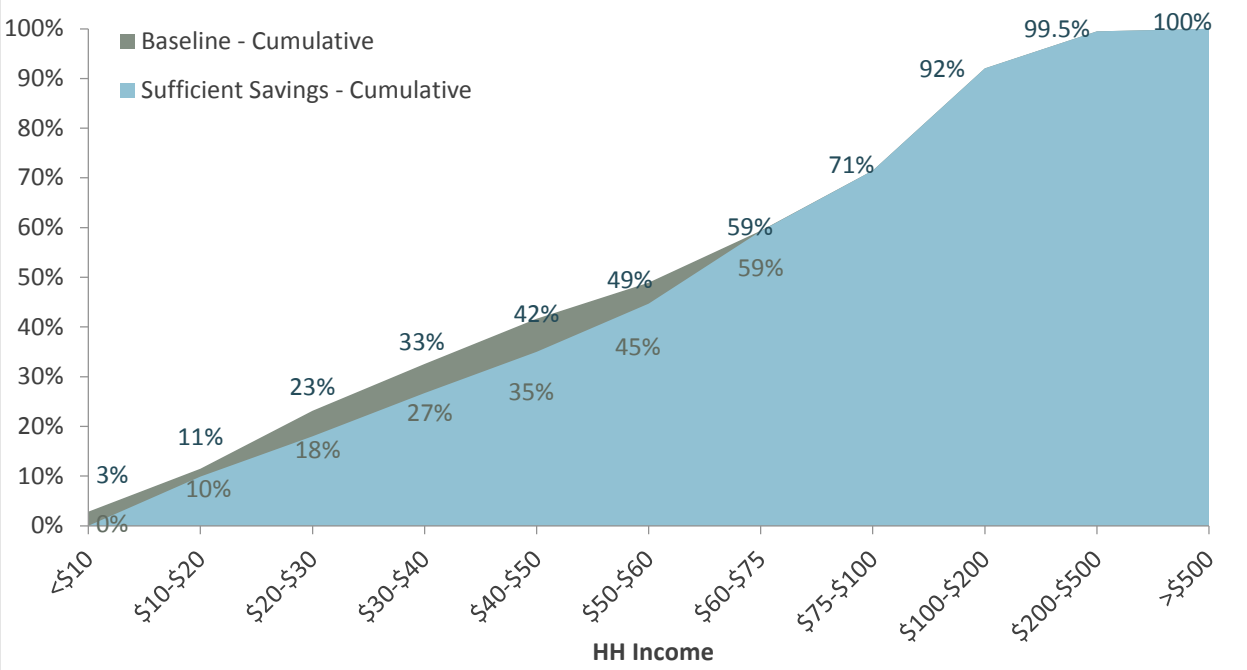
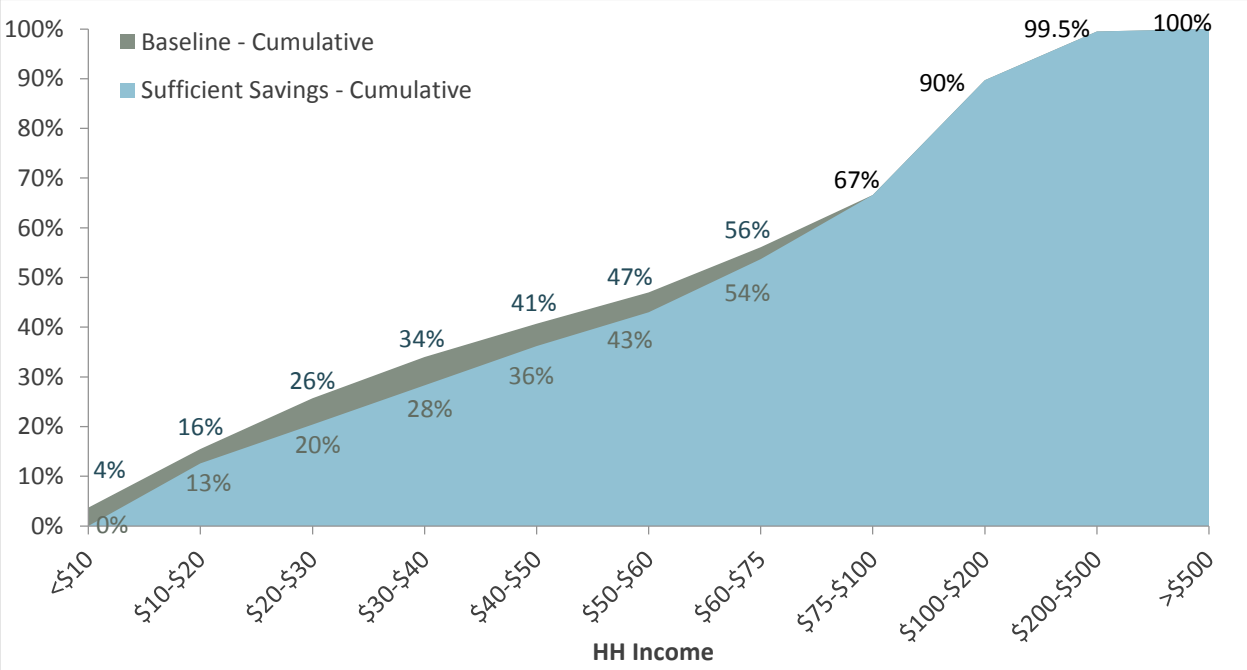



Figure 1.12: Cumulative Income Distribution of Elderly Households by Scenario – 2035




*Source: ESI Modeling of CPS Data*

# 2. Expenditure Impacts

Expenditure impacts from insufficient savings on assistance programs supporting elderly households are estimated through the following sequence of steps:

- **Current program expenditures for elderly households** are estimated through analysis of state budgetary and program data (Section 2.1)
- **Program expenditures by income level** are modeled based on program participation data and eligibility rules (Section 2.2)
- **Expenditure impacts from differences in income between scenarios** are assessed in order to quantify the impact from insufficient savings on program costs (Section 2.3).

## 2.1. Program Expenditures for Elderly Households

### Identifying Expenditure Categories

The first step to quantify the impact of retirement savings levels on public assistance costs is to identify the assistance programs that would be impacted by changes in the characteristics of Colorado's elderly population.

This analysis is most focused on means-tested programs, for which eligibility and state outlays are directly impacted by the level of savings held by households as reflected in their annual income. Most notably among these categories is Medicaid, a program jointly funded by federal and state governments that provides additional health insurance coverage beyond Medicare to many lower-income seniors.

Additional programs were identified that were not means-tested, but were targeted specifically to seniors. In some cases, these programs disproportionately serve a lower income population, and accordingly would be impacted by changes in savings and income, while in other cases changes in program demand are correlated with the size of the senior population. This framework excludes general state services used by both the senior and non-senior populations (such as programs related transportation, corrections, housing, etc.) which are not materially impacted by senior income levels. This analysis also excludes programs that are entirely federally funded.

Expenditure categories were identified using a mix of state budgetary information[13] and a number of recent studies which identified key expenditure implications of the anticipated aging of Colorado's population.[14] The identified means-tested programs and senior-targeted programs are outlined in Figures 2.1 and 2.2.

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[13] Throughout this section, budget information is drawn from budgeted expenditures for Fiscal Year 2019-2020.

[14] See: Colorado Future's Center. "The Effects of Aging on Colorado's Revenues and Expenditures: A View to 2030."
Governor's Office of State Planning and Budgeting. "Colorado's State Budget on Aging." (2018)
Department of Health Care Policy and Financing. "Improving Health & Quality to Help Coloradans Thrive (FY 2017-2018 Annual Report)."

Figure 2.1: Identified Means-Tested Assistance Programs

| Program (Agency) | Eligibility |
|---|---|
| **Medicaid (DHS)** | |
| Home and Community-Based Services (HCBS) | Colorado residents that demonstrate a need for nursing home level of care, earn less than $2,313 per month, and have less than $2,000 in assets can receive benefits from the Medicaid waivers programs, HCBS, or the nursing Medicaid programs. If the applicant is applying with a spouse, the income limit doubles to $4,626 per month and the asset limit increases to $3,000 ($4,000 if a couple plans on staying in the same nursing room). If the applicant is married but only one person is applying, the income limit is $2,313 and the asset level reverts to $2,000, but an addition asset level of $126,420 is included for the non-applicant. |
| Long-Term Care | |
| Medicaid - Dental Care | |
| Medicaid – Other | Single Colorado residents with a monthly income (countable income includes wages, pension payments, Social Security, Disability Income, veteran's benefits, IRA withdrawals, and stock dividends) of less than $771 and with less than $2,000 in assets (countable assets include cash, ownership of stocks and bonds, and savings and checking accounts; cars, a primary home, and personal belongs are not countable) are eligible for Medicaid. If the applicant is married, the income limit shifts to $1,157 per month and the asset limit increases to $3,000. The same requirements follow if the applicant is married but only one person is applying, except the asset level falls back to $2,000. |
| Medicaid Modernization Payments | Each state is mandated to make a payment to the federal government to reduce Medicare Part D (prescription drug) costs. The state payment is determined by a formula that takes into account the number of Medicare and Medicaid dual enrollees participating in the Part D program. Therefore, eligibility standards for Medicaid and senior income levels impact state costs for this payment. |
| **Other Programs** | |
| Old Age Pension (DHS) | Colorado residents 60 years or older whose monthly income is deemed less than established minimum acceptable level of monthly income for a particular year. In 2019, eligible applicants must have a monthly income of less than $809 and resources valued at less than $2,000 per individual or $3,000 per married household. The monthly payment amount is determined based on the difference between the established minimum income ($809) and the applicant's total gross income and is thus capped at a maximum benefit payment of $809 |
| Old Age Pension – Medical (DHS) | Beyond the standard OAP program, the state also provides a smaller health and medical care program for Colorado residents that receive OAP payments but do not qualify for Medicaid. |
| Home Care Allowance (DHS) | Colorado residents 18 years or older who receive Supplemental Security Income (SSI) or are in the Colorado Aid to the Needy Disabled (AND) program. The Colorado AND program serves Coloradans aged 18-59, so the relevant eligibility requirements for seniors are those required to receive SSI. As of 2019, to be eligible for SSI, applicants can have a maximum individual monthly income of up to $771 and countable resources not exceeding $2,000 per individual or $3,000 per married household. |
| Dental Care for Low-Income Seniors (HCPF | Colorado residents 60 years or older who have a maximum income of up to 250% of the most current published Federal Poverty Level (FPL) and who do not have or qualify for any other dental insurance such as Medicaid. According to 2019 FPL guidelines, the maximum income for eligible applicants is $2,602 per individual or $3,523 per 2-person household |
| Low Income Energy Assistance (DHS) | Colorado residents who pay home heating costs and earn a maximum family household income no higher than 60% of the state's median income level. In 2019, the established maximum income levels for LEAP were $2,371 per individual or $3,101 per 2-person household. |

*Source: ESI analysis of program information*

Figure 2.2: Identified Senior-Targeted Assistance Programs

| Program | Program Description |
|---|---|
| Senior Property Tax Exemption (Treasury) | The Property Tax Exemption program allows seniors to reduce their local property tax bill. Qualified applicants – a senior who is 65 or older or a surviving spouse of a senior who previously qualified – receive an exemption from taxation on 50 percent of the first $200,000 in actual value of their primary residence. |
| Older American Act Programs (DHS) | The federal Older Americans Act created an "Aging Network" of 16 Area Agencies on Aging (AAAs) around the state that contract with local service providers to offer an array of support services to older Colorado residents, such as transportation, legal assistance, and personal care. In order to direct additional resources to the AAAs, the Older Coloradans Cash Fund was created to provide state funding support for AAAs, referred to as State Funding for Senior Services (SFSS). To be eligible for the program, applicants must be 60 years or older. While the program is not means tested, its resources are targeted to participants with the greatest demonstrated social and economic need. |
| Adult Protective Services (DHS) | The Adult Protective Services program provides protective services to prevent, reduce, or eliminate the existing or potential risk of mistreatment or self-neglect of at-risk adults. To be eligible for the program, applicants must be adults 18 years or older (76 percent of participants are over 60) and susceptible to mistreatment or self-neglect due to inability to perform or obtain necessary services because they lack sufficient understanding or capacity to make or communicate responsible decisions. |
| Veterans Community Living Centers (DHS) | Veterans Community Living Centers are a state-supervised system of nursing homes for veterans and families of veterans offering long-term care, short-term rehabilitation, assisted living, and other services. Honorably-discharged veterans, spouses/widows of veterans, and Gold Star parents (of children who died while serving in the Armed Forces) are eligible for services. Of the population served by the program, 98 percent are over 60 years old. Currently, state Division of Veterans Affairs operates five locations throughout the state. |

*Source: ESI analysis of program information*

## Current Program Expenditure Levels

Next, expenditure levels are defined for each of the identified programs. First, *total expenditures* from Fiscal Year (FY) 2020 for each program are identified (inclusive of all funding sources) through state budget documents. Next, expenditures from specifically from state funds are identified among these total expenditures. This category includes all state-generated revenues (including the General Fund and Cash Fund), while excluding federal and local funds.

Finally, budget and program data are used to isolate *expenditures from state funds on elderly residents.* This apportionment analysis builds on a study by the Governor's Office of State Planning and Budgeting that defined program expenditures for the elderly population as of FY 2018,[15] as well as program data and analysis provided by the Department of Human Services and the Department of Health Care Policy and Finance.[16] As needed, proportions of spending attributable to the elderly population from earlier analyses were extrapolated forward to overall FY 2020 program budget levels.

Figure 2.3 summarizes the anticipated program expenditures for FY 2020 within each of these categories for each of the fourteen identified programs. Total expenditures across these programs is $11.14 billion, of which $4.44 billion in state-funded. Of this state-funded activity, $1.26 billion is estimated to be attributable to Colorado's elderly population.

The largest of these program expenditures is from spending on Medicaid, which uses a mix of state and federal funds to provide supplemental medical services to qualifying elderly residents (including long-term care).[17] State Medicaid expenditures for elderly Coloradans in FY 2020 are estimated to total $950 million, or about three-quarters of state program expenditures on seniors identified in this analysis. The Medicaid program is separated into five sub-programs for the purpose of this analysis, since each of these areas functions somewhat differently with respect to state expenditures for elderly residents.

[15] Governor's Office of State Planning and Budgeting. "Colorado's State Budget on Aging."

[16] Department of Health Care Policy and Financing. "Improving Health & Quality to Help Coloradans Thrive (FY 2017-2018 Annual Report)."

[17] Most Medicaid spending for the elderly population is for "dual eligible" enrollees who qualify for both federally funded Medicare (due to their age) and jointly funded Medicaid (due to income-based or other qualification standards).

Figure 2.3 Colorado Expenditures on Senior Population, FY 2020

| Program | State Dpt | Total Expenditures ($M) | Est. Expenditures from State Funds ($M) | Est. Expenditures from State Funds on 65+ ($M) |
|---|---|---|---|---|
| *Medicaid* | | | | |
| Home and Community Services | HCPF | $1,116 | $554 | $213 |
| Long-Term Care | HCPF | $1,190 | $602 | $425 |
| Dental - Medicaid | HCPF | $69 | $34 | $34 |
| Other Medicaid | HCPF | $8,162 | $2,753 | $192 |
| Medicaid Modernization Payment | HCPF | $153 | $153 | $86 |
| **Sub-Total: Medicaid** | | **$10.69 billion** | **$4.10 billion** | **$950 million** |
| *Means-Tested* | | | | |
| Old Age Pension | DHS | $106 | $106 | $92 |
| Old Age Pension – Medical | DHS | $10 | $10 | $9 |
| Home Care Allowance | DHS | $10 | $9 | $8 |
| Dental Health Care | HCPF | $3 | $3 | $3 |
| Energy Assistance | DHS | $48 | $4 | $1 |
| **Sub-Total: Means-Tested** | | **$177 million** | **$132 million** | **$113 million** |
| *Senior-Targeted* | | | | |
| Property Tax Exemption | Treasury | $156 | $156 | $153 |
| Older Americans Act | DHS | $48 | $33 | $29 |
| Adult Protective Services | DHS | $19 | $17 | $11 |
| Veterans Community Living | DHS | $54 | $1 | $1 |
| **Sub-Total: Senior-Targeted** | | **$277 million** | **$207 million** | **$193 million** |
| **Total** | | **$11.14 billion** | **$4.44 billion** | **$1.26 billion** |

*Source: ESI analysis of budget and program data*

## 2.2. Program Expenditures by Income Level

Next, the program expenditures for seniors residents identified in Section 2.1 are allocated to Colorado's current distribution of senior households by income band. This allocation incorporates the number of households in each income band (as defined by the 2020 Baseline scenario modeled in Section 1.3) and ensures that the current allocation aligns with the total estimated state expenditures for elderly residents for each program.[18]

The aggregate state assistance costs for elderly residents detailed in Figure 2.3 vary significantly by income level. The relationship between income and assistance levels arises from the eligibility and means-testing rules of each program. Some programs include income qualification rules for enrollment,

[18] This "top down" approach, rather than a "bottom up" approach of estimating expenditures by income band based purely on survey data, program data, or eligibility rules maximizes the relative accuracy of the analysis by ensuring alignment with overall budget data.

while others provide differentiated benefit levels depending on the income level of enrollees. In either case, state assistance costs will vary by income level (generally decreasing as income grows).

## Medicaid Programs

For Medicaid and its component programs, anonymized participant information covering the years 2015-2019 was provided by the state's Department of Health Care Policy and Finance (HCPF). This dataset reflects incomes for enrollees as a proportion of the Federal Poverty Level (FPL), as well as the age distribution of enrollees.

Information is reported for major programs serving elderly Coloradans, including Home and Community-Based Services, Hospice (Long-Term Care), and Dental Care. In addition, data on "dual enrollees" between Medicaid and Medicare is reported as a proxy for the contribution required by the state to the federal government for prescription drug reimbursements under Medicare Part D.

Analysis of HCPF data yields distributions of the proportion of beneficiaries at various income levels relative to the FPL. Within each of the programs, more than 50 percent of participants fell at or below the FPL (see Figure 2.4).[19]

Figure 2.4 Medicaid Participant Incomes by Share of the Federal Poverty Level, 2015-2019

| Income Relative to FPL | Home and Community Based Services | Long-Term Care | Medicaid - Dental | MMP (Dual Enrollees) |
|---|---|---|---|---|
| 0-50% | 41% | 30% | 35% | 27% |
| 51-100% | 28% | 21% | 30% | 34% |
| 101-125% | 13% | 13% | 11% | 14% |
| 126-150% | 8% | 12% | 9% | 13% |
| 151-175% | 5% | 8% | 6% | 5% |
| 176-200% | 3% | 6% | 4% | 3% |
| 201-225% | 1% | 3% | 2% | 2% |
| 226-250% | 0% | 2% | 1% | 1% |
| 251-275% | 0% | 2% | 1% | 1% |
| 276-300% | 0% | 1% | 1% | 0% |
| 301-325% | 0% | 1% | 0% | 0% |
| 326-350% | 0% | 0% | 0% | 0% |
| 351-375% | 0% | 0% | 0% | 0% |
| 376-400% | 0% | 0% | 0% | 0% |
| **At/Below FPL** | **69%** | **51%** | **66%** | **61%** |

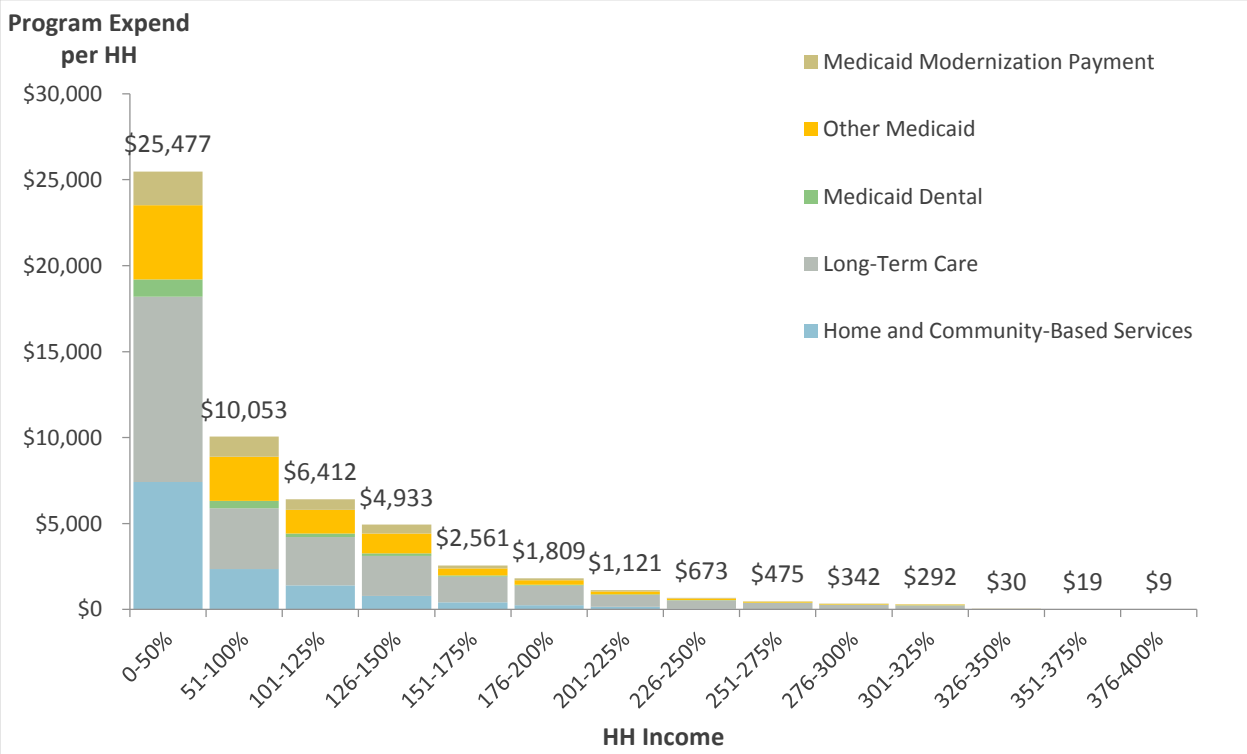
*Source: ESI analysis of Department of Health Care Policy and Finance data*

[19] The FPL for 2019 is 12,490 for a one-person household and $16,910 for a two-person household (and higher for larger households). Since the FPL is adjusted each year based on changes in income data, participation data relative to the FPL is comparable over time since inflation is effectively captured within the calculation. Multiple years of data (2015-2019) can therefore be appropriately combined, providing additional sample size for the analysis.

These proportions are then applied to the corresponding state expenditure figures (on seniors 65+) listed in Figure 2.3 to yield estimated state expenditures on seniors in each income band. These total expenditure amounts are then divided by the number of senior households within each income band to yield the per capita (per senior household) expenditure from state funds for each program (see Figure 2.5).[20]

State expenditures on Medicaid programs drop from an average of $25,477 per household earning a maximum of 50 percent of the Federal Poverty Level to less than $500 for households earning more than 250 percent of the FPL. In aggregate, 98% of state Medicaid expenditures for seniors are attributable to households at or below 250 percent of the poverty line.[21]

Figure 2.5 State Expenditures on Medicaid per Elderly Household by Income Level, 2020




*Source: ESI analysis of HCPF data*

[20] For the purpose of these household estimates, income distribution scenarios estimated in Section 1.3 are translated from dollar value increments (for example, $10,000-$20,000) to percentages relative to the FPL (for example, 50%-100%). Since FPL cut-offs vary by household size, this step is undertaken by proportioning the observed proportion of household sizes for senior households (of which 44% are estimated to be one-person households, 53% two-person households ad 3% of greater size) to assign each households in each income band used elsewhere in this to a corresponding FPL band.

[21] 250 percent of the FPL for 2019 corresponds with $31,225 for a one-person household, $42,275 for a two-person household and $53,325 for a three-person household.

## Non-Medicaid Assistance Programs

Next, estimates are developed for means-tested programs outside of Medicaid, as well as the identified senior-targeted programs. This analysis relies on a mix of participant data, demographic data, and eligibility requirements to allocate program expenditures for elderly households by income band.

Anonymized demographic data on program beneficiaries was released to ESI by the Colorado Department of Human Services and Colorado Department of Health Care Policy and Planning and for several programs.[22] [23]

Where demographic data was unavailable, program eligibility requirements were matched with population and income data to estimate the proportion of potential beneficiaries in each income band. This proportion was used as a proxy for the distribution of expenditures among income bands.[24]

Finally, state expenditures for the Veterans Community Centers and Senior Property Tax Exemptions are distributed evenly across the income bands on a per capita basis. Veterans Community Centers are primarily funded by the federal government, with an annual contribution from the state of $1 million for administration. Participant demographics are utilized to model the federal budgetary effects (covered in Section 2.3), while state impacts are assumed to be tied to population levels rather than income differentials, since they are administrative in nature.

The Senior Property Tax exemption allows elderly households to reduce their local property tax bills by exempting from taxation 50 percent of the first $200,000 of their primary residence. As a result, the assessed value of residences held by elderly households will impact the level of program expenditures. Within the context of this study, however, the relationship between retirement savings and property values is less definitive than the relationship between retirement savings in income; since increased savings levels do not necessarily imply a greater investment in housing (particularly for since many senior households have already paid off a mortgage).[25] Therefore, expenditures within this program are

[22] Spending analysis for the OAP Medical Program as well as all Medicaid programs (Medicaid Dental Care, Medicaid Home and Community-Based Services, Medicaid Hospice / Nursing Home Services, Medicare Modernization Payments and Other Medicaid) included in this analysis is based on ESI's analysis of historical (5-year) demographic data of program beneficiaries released by the CO Department of Health Care Policy and Planning.

[23] Spending analysis for Adult Protective Services, Older Americans Act Programs / State Funding for Senior Services, and Veterans Community Living Centers is based on demographic data for 2019 program beneficiaries released to ESI by DHS. Analysis of the Old Age Pension – Medical program is based on participant data provided by HCPF, which is analyzed by converted income data relative to the FPL to income bands in the manner described in the Medicaid analysis above.

[24] Means-tested programs for which complete demographic data on beneficiaries were unavailable are: Old Age Pension, Low-Income Energy Assistance, and Home Care Allowance. Notably, this approach effectively assumes uniform participation rates across potential beneficiaries (calibrated to the estimated overall spending on elderly households). This approach may be conservative with respect to the impact of income, if in practice participation rates or benefits levels per participant are higher among the lowest income households.

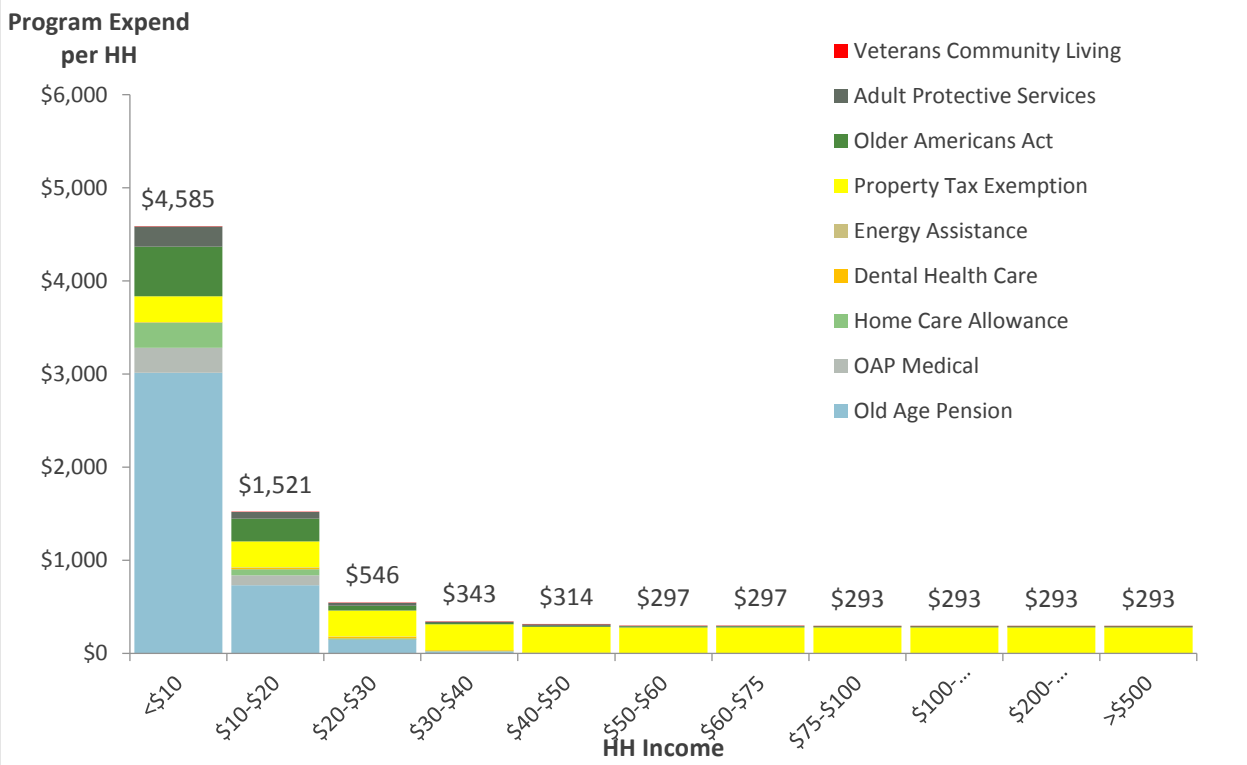
[25] Housing markets also operate within the broader context of a market dictated by supply and demand, further complicating efforts to isolate property value impacts for senior households. Notably, the exclusion of property value impacts from this approach means that these effects are also excluded from local tax impacts calculated in Section 3.

correlated with the size of the elderly population within this analysis, but are not adjusted across income bands.[26]

These estimated proportions of state spending per program in each income band are then applied to the corresponding statewide program expenditures on seniors 65 and older outlined in Figure 2.3. The resulting estimated expenditure in each band is then divided by the number of senior households in that band to yield an estimate of the per capita cost to the state of an elderly household within each income band.

Figure 2.6 shows per household state assistance program costs for non-Medicaid programs by income band 2020. Costs fall from an average of $4,855 for households with less than $10,000 in income to $343 and below for households with $30,000 and above in income. This drop is primarily attributable to the Old Age Pension program, which is narrowly targeted to lower income households.

Figure 2.6 State Expenditures on Non-Medicaid Programs per Elderly Household, 2020




*Source: ESI analysis of program data and eligibility rules*

[26] In practice, this is implemented by holding per household expenditures constant across all income bands.

## Excess Medical Inflation

The analysis holds constant the level of demand and the level of benefits or services received on a per household basis. For non-medical programs, this means that program spending by income band is held steady over time (since results are expressed in common $2020). An adjustment is needed to account for excess medical inflation, which is anticipated to increase the real cost of medical care relative to other goods and services over time.

The Congressional Budget Office projects a growth in "excess medical costs" for the Medicaid program of 1.1 percent per year from 2019 to 2049 in its latest long-term federal budget outlook.[27] Applying this annual growth rate to the study years of 2020 to 2035 implies a growth rate for Medicaid costs of 27% faster than inflation.[28] This increase is will be applied to the estimated per household spending for assistance programs providing medical services to model program expenditures out to 2035.

The changes in the state's demographics combined with increases in medical costs will yield significant increase in Medicaid spending over the modeled time period, independent of any changes in senior incomes. This cost growth over time is incorporated into both the baseline and sufficient savings income scenarios modeled in Section 2.3..

[27] Congressional Budget Office 2019 Long-Term Budget Outlook. June 2019.

[28] Note that while excess medical inflation is modeled to "crowd out" other expenditure types within the household spending analysis (since household budgets are effectively capped by available income), government spending on medical service is structured as an entitlement program. In order to maintain a consistent level of service provision, this increased growth is not offset by reductions in any other program within this analysis (though the state would in practice face constraints across programs).

## 2.3. Expenditure Impact from Insufficient Savings

The next step in this analysis is to extend program expenditures per household by income level out to 2035 under the "baseline" and "sufficient savings" demographic and income scenarios. The resulting gap in state program expenditures between scenarios is understood as the impact from insufficient savings.

### Overview of Demographic Change and Income Scenarios

Colorado's senior population is anticipated to grow from 872,000 to 1.31 million over the 2020-2035, while households headed by seniors are projected to increase by 49% from 548,000 to 816,000. Further, the share of households represented by seniors is projected to grow from 23.6% in 2020 to 27.7% in 2035. These population projections are held consistent across income scenarios outlined in Section 1.3.[29]

### State Expenditure Impact

The demographic and income scenarios for the elderly population in 2020 and 2035 are applied to the per household state program expenditure analysis outlined in Section 2.2. The net differential in state costs between scenarios represents the incremental state spending attributable to insufficient savings, when holding constant the level of services or benefits provided to each household at a given income level.

#### Medicaid Programs

Figure 2.7 shows projected state Medicaid expenditures for elderly households from 2020 to 2035 under the baseline and sufficient savings scenarios. Under the baseline scenario, Medicaid program expenditures for Colorado's elderly households are estimated to rise from $950 million in 2020 to $2.07 billion in 2035.[30] Under the sufficient savings scenario, Medicaid expenditures are expected to rise from $679 million in 2020 to $1.42 billion in 2035.

The net difference in state expenditures on Medicaid programs between the two income scenarios represents the incremental state spending attributable to insufficient savings. This net difference grows from $272 million in 2020 to $650 million in 2035, and totals $7.36 billion across the fifteen year period from 2021-2035.[31]

[29] See Section 1.2 and Section 1.3 for more detail on the demographic change and income scenarios utilized within this analysis.

[30] This growth over time is attributable to demographic changes and excess medical inflation alone, prior to any changes in modeled savings behavior.

[31] Through this report, cumulative results are calculated over the period from 2021-2035 (inclusive) in order to conform to a fifteen year analysis period.

Figure 2.7: Projected State Medicaid Expenditures on Elderly Households, 2020-2035 ($2020)

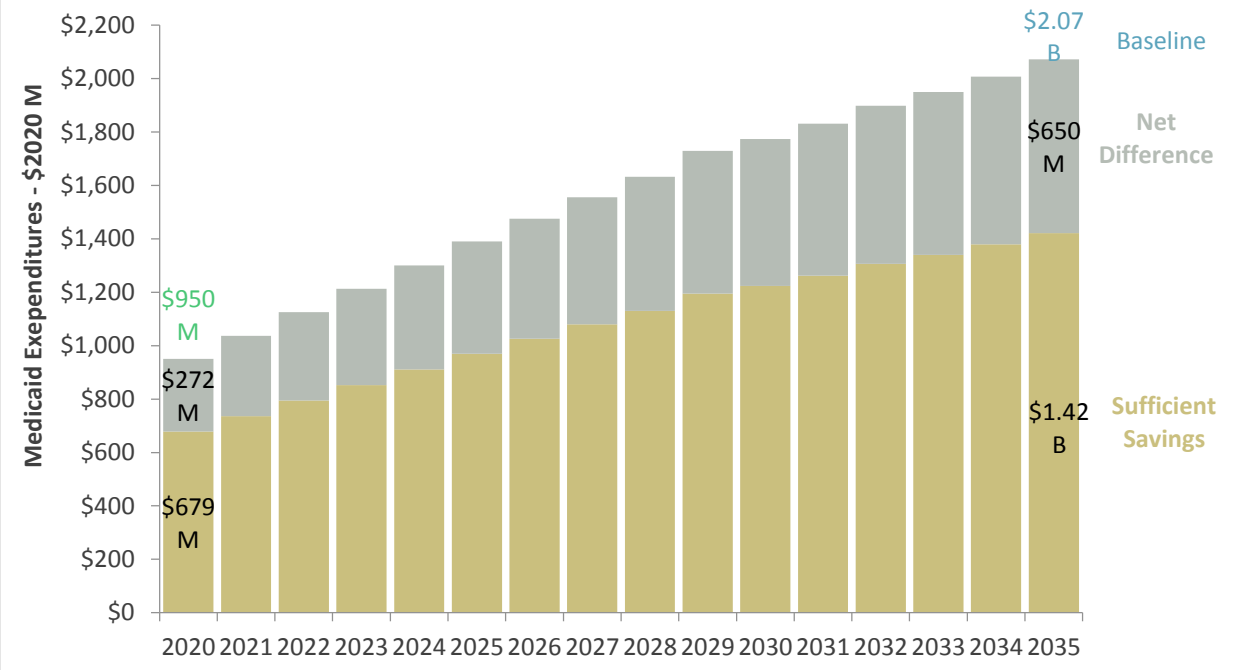



Figure 2.8: Net State Spending on Medicaid Attributable to Insufficient Savings (in Millions - $2020)

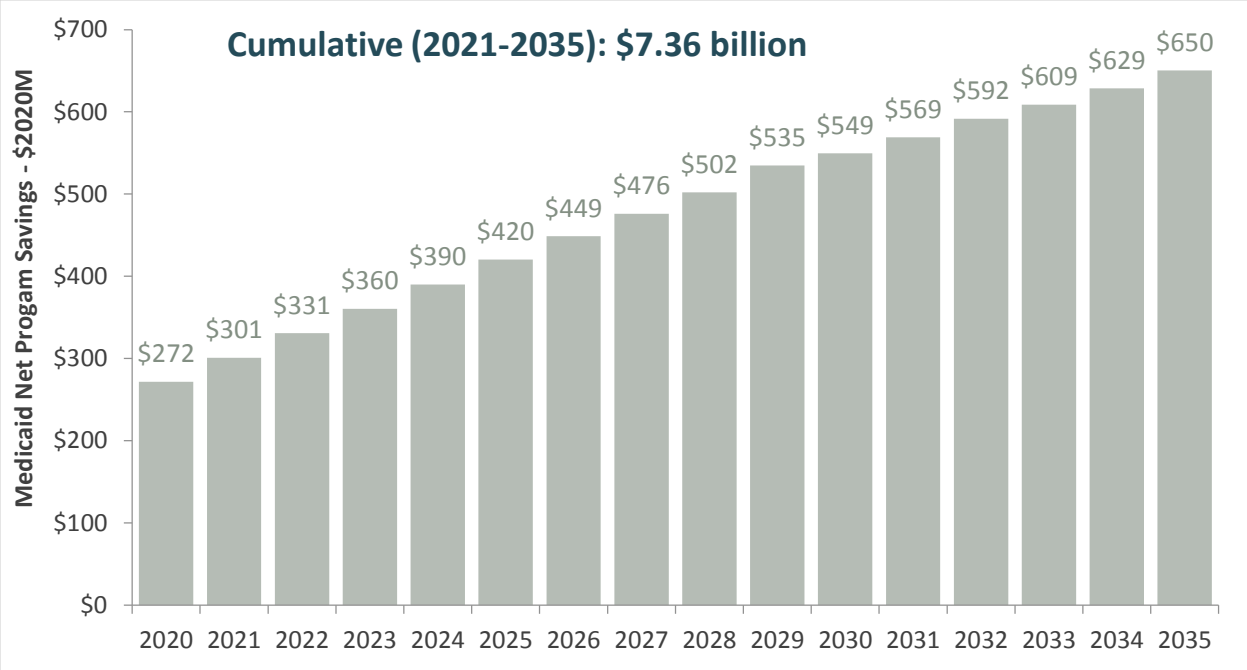


Figure 2.9 below shows net expenditures by sub-program within Medicaid. Long-Term Care represents the largest expenditure category for elderly households, followed by Home and Community-Based Services.

Figure 2.9: Net State Expenditures due to Insufficient Savings – Medicaid Programs (in $2020)

| | Baseline | | Sufficient Savings | | Net Difference | | |
|---|---|---|---|---|---|---|---|
| **Program** | **2020** | **2035** | **2020** | **2035** | **2020** | **2035** | **Cumulative** |
| Home and Community-Based | $213 | $477 | $139 | $297 | $74 | $180 | $2,029 |
| Long-Term Care | $425 | $890 | $288 | $593 | $136 | $298 | $3,442 |
| Medicaid Dental | $34 | $77 | $25 | $53 | $9 | $23 | $260 |
| Other Medicaid | $192 | $433 | $156 | $330 | $36 | $103 | $1,124 |
| Medicaid Modern Payment | $86 | $195 | $70 | $149 | $16 | $46 | $507 |
| **Total** | **$950** | **$2,072** | **$679** | **$1,422** | **$272** | **$650** | **$7,362** |

## Non-Medicaid Programs

The same approach is used to translate per household expenditures by income band for non-Medicaid programs to aggregate state expenditures for elderly households from 2020 to 2035 under the baseline and sufficient savings scenarios.

Non-Medicaid program expenditures for Colorado's elderly households are anticipated to total $306 million in 2020, rising to $519 million by 2035 in the baseline scenario. Assistance costs are lower in the sufficient savings scenario due to the improved income levels of retiree households. In this scenario, state program expenditures for elderly households are anticipated to total $242 million in 2020, rising to $391 million by 2035 (see Figure 2.10).

The net difference in state expenditures on non-Medicaid programs between the two income scenarios represents the incremental state spending attributable to insufficient savings. This net difference grows from $63 million in 2020 to $128 million in 2035, and totals $1.53 billion across the fifteen year period from 2021-2035 (see Figure 2.11).

Figure 2.10: Projected State Non-Medicaid Program Expenditures for Elderly Households, 2020-2035 (in Millions - $2020)

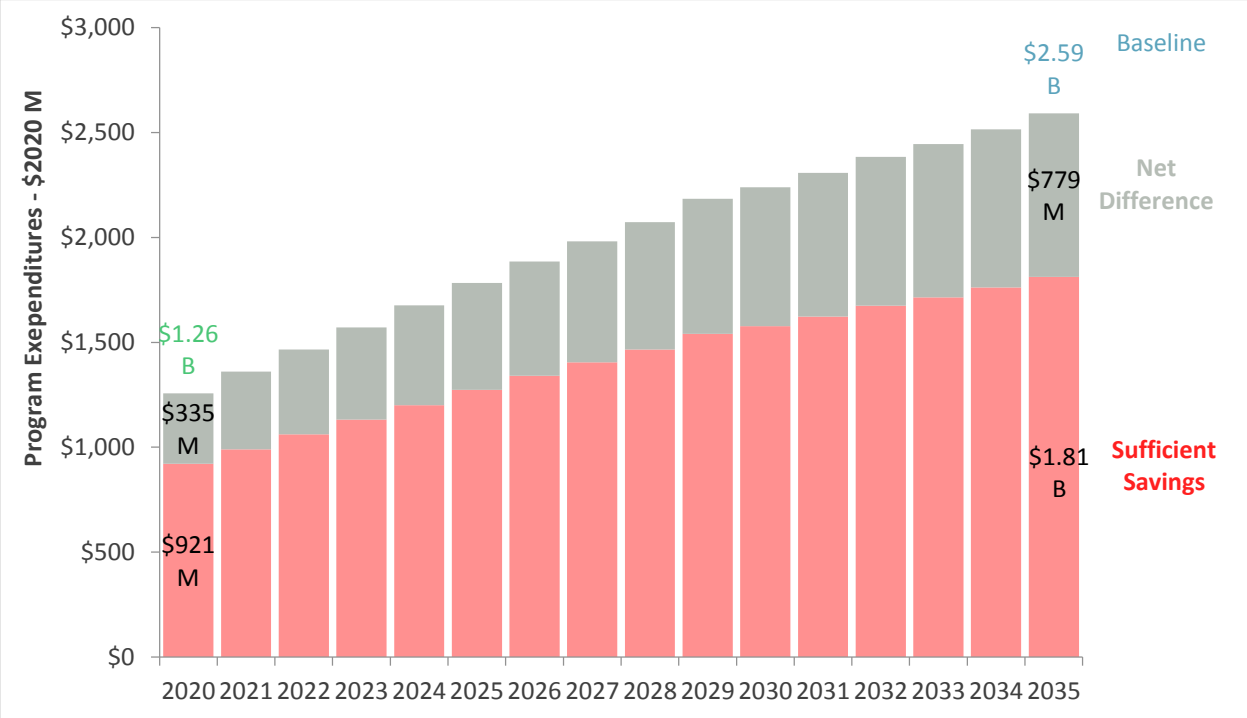



Figure 2.11 Net State Spending on non-Medicaid Programs Attributable to Insufficient Savings (in Millions - $2020)

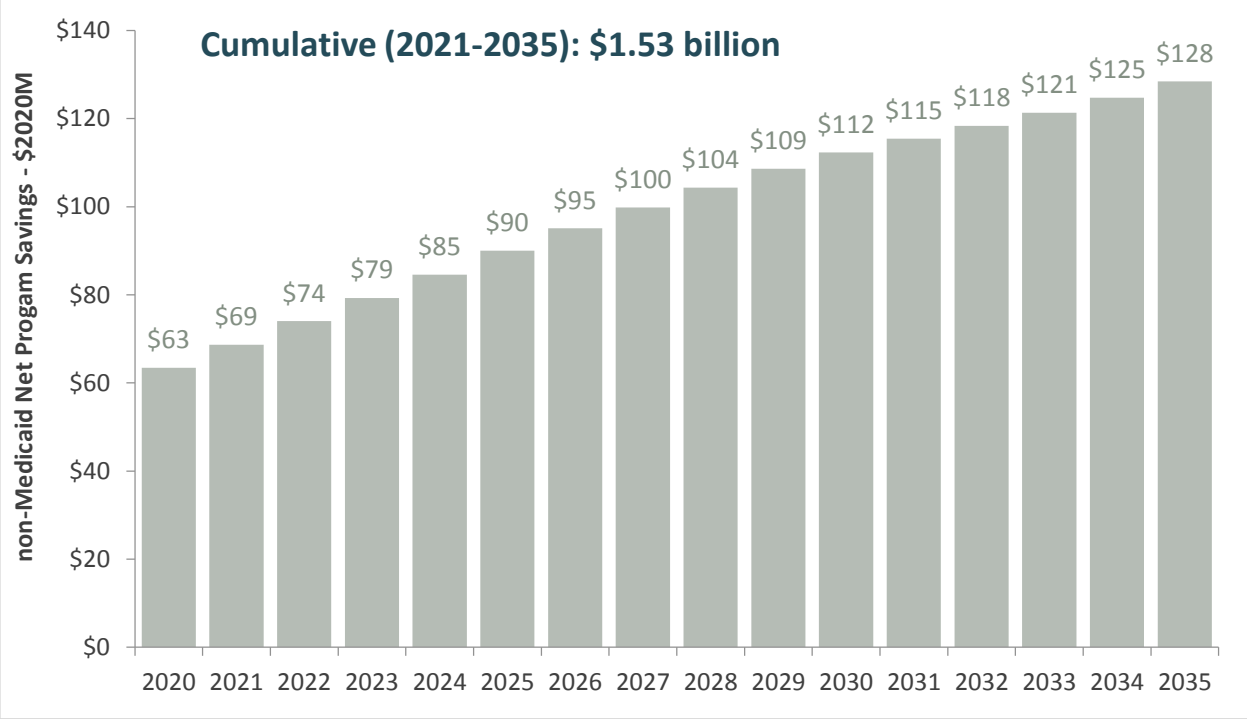


Figure 2.12 shows non-Medicaid impacts by program. Means-tested programs account for $1.27 billion of the $1.53 billion in cumulative difference between scenarios, with the bulk of the impact driven by the Old Age Pension program ($1.07 billion).

Figure 2.12: Net State Expenditures due to Insufficient Savings – non-Medicaid Programs (in Millions- $2020)

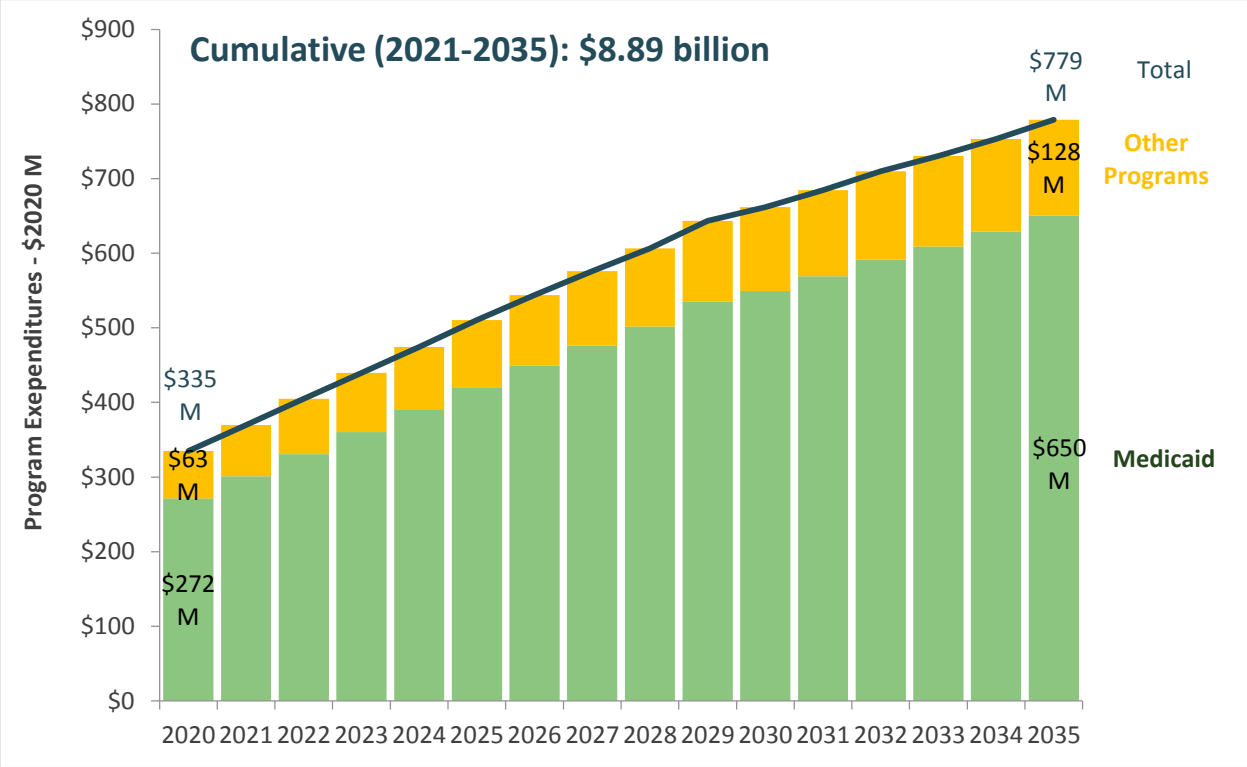
| | Baseline | | Sufficient Savings | | Net Difference | | |
|---|---|---|---|---|---|---|---|
| **Program** | **2020** | **2035** | **2020** | **2035** | **2020** | **2035** | **Cumulative** |
| Old Age Pension | $92 | $175 | $47 | $86 | $45 | $89 | $1.07 billion |
| Old Age Pension – Medical | $9 | $23 | $6 | $14 | $3 | $9 | $103 million |
| Home Care Allowance | $8 | $16 | $4 | $8 | $4 | $8 | $94 million |
| Dental Health Care | $2.6 | $4.9 | $2.3 | $4.5 | $0.3 | $0.4 | $5 million |
| Energy Assistance | $0.5 | $0.9 | $0.4 | $0.8 | $0.1 | $0.2 | $2 million |
| **Means-Tested – Sub-Total** | **$113** | **$220** | **$60** | **$113** | **$53** | **$107** | **$1.27 billion** |
| Property Tax Exemption | $153 | $227 | $153 | $227 | $0 | $0 | $0 |
| Older Americans Act | $29 | $52 | $21 | $37 | $7 | $15 | $177 million |
| Adult Protective Services | $11 | $19 | $8 | $12 | $3 | $7 | $79 million |
| Veterans Community Living | $1 | $1 | $1 | $1 | $0 | $0 | $0 |
| **Senior-Targeted Sub-Total** | **$193** | **$299** | **$182** | **$278** | **$11** | **$21** | **$256 million** |
| **Total** | **$306** | **$519** | **$242** | **$391** | **$63** | **$128** | **$1.53 billion** |

### Net State Spending on Medicaid and non-Medicaid Programs

Finally, net state expenditures – the difference in state spending between the sufficient savings scenario and the baseline scenario – for Medicaid and non-Medicaid programs are aggregated.

Figure 2.13 demonstrates the incremental state spending on all identified programs attributable to insufficient savings. It is estimated that in 2020, the state spends an additional $335 million on the identified senior-serving programs due to insufficient retiree savings levels. In 2035, the state's total additional spending on assistance programs due to insufficient savings rises to $779 million. The cumulative differential across the fifteen year period from 2021-2035 is estimated to total $8.89 billion.

Figure 2.13: Aggregate Additional State Spending Attributable to Insufficient Savings (in Millions - $2020)




The fiscal challenges presented by demographic change and increased program demand (absent any change in savings behavior) are also impacted by revenue constraints through TABOR. Under this framework, annual state revenue growth is limited to a combination of population growth and inflation. However, as reviewed above, the relative aging of the population is anticipated to lead to an increase in assistance program demand, above and beyond overall population growth. Further, health care costs, which represent the bulk of service demands for this group, are anticipated to grow at a rate that exceeds inflation. This combination of factors suggests that baseline expenditures to provide a consistent level of services are likely to outpace population and inflationary growth. Absent any change in revenue growth, this dynamic will put significant pressure on funds available for other state priorities.

## Federal Expenditure Impact by Income Scenario

A significant level of assistance spending for elderly households is provided at the federal rather than state level. This analysis focuses on programs that are fully or partially funded at the state level, and does not present comprehensive information on federal programs such as Medicare and Social Security. However, for the identified programs in Section 2.1 that are supported by a combination of state and federal funds (most notably Medicaid), it is possible to extrapolate the state funding analysis undertaken above to estimate the differential between savings scenarios on federal assistance costs.

Federal expenditures on Medicaid for elderly Coloradans are modeled through an extrapolation of modeled state costs by income group relative to the FPL. Since Medicaid costs for elderly residents are

shared between federal and state governments by formula, the ratio of federal to state expenditures by program reflected in Colorado's FY 2020 budget is applied to the modeled state expenditure growth between scenarios to model cost differentials for the federal government.[32]

Federal contributions to non-Medicaid programs are also modeled by calibrating the state costs analysis to the relative federal and state funding levels. Finally, anonymized participant data provided by DHS is used to allocate expenditures in the Veterans Community Living program by income band, and this allocation is used to model federal costs under the various income scenarios.[33]

The differential in federal assistance costs between the two income scenarios for each of these identified programs is estimated to total $299 million in 2020. This figure grows to $718 million in 2035, and totals $8.12 billion over the fifteen year period from 2021-2035 (see Figure 2.14).

Figure 2.14: Net Federal Program Spending due to Insufficient Savings ($2020)

| Program | 2020 | 2035 | Cumulative |
|---|---|---|---|
| Medicaid | | | |
| Home and Community-Based Services | $75 M | $183 M | $2.06 billion |
| Long Term Care | $133 M | $291 M | $3.36 billion |
| Medicaid Dental | $9 M | $24 M | $261 million |
| Other Medicaid | $71 M | $202 M | $2.21 billion |
| **Sub-Total - Medicaid** | **$288 M** | **$699 M** | **$7.89 billion** |
| Other Programs | | | |
| Energy Assistance | $1 M | $2 M | $23 million |
| Older Americans Act | $3 M | $7 M | $82 million |
| Adult Protective Services | $0.4 M | $1 M | $10 million |
| Veterans Community Living | $6 M | $9 M | $115 million |
| **Sub-Total - Other Programs** | **$11 M** | **$19 M** | **$230 million** |
| **Total** | **$299 million** | **$718 million** | **$8.12 billion** |

[32] Federal shares of Medicaid program costs are estimated at 50.4% for Home and Community-Based Services, 49.4% for Long-Term Care, 50.1% for Medicaid-Dental and 66.3% for other Medicaid costs. Medicare Modernization Payments are not a federal cost category, since they represent a state payment to the federal government for prescription drug costs under Medicare Part D

[33] As detailed in Section 2.1, state funding for the Veterans Community Living program is dedicated to administration, and accordingly is not modeled to vary by income level.

# 3. Revenue Impacts

Revenue impacts from insufficient savings are estimated through the following sequence of steps:

- **Household spending patterns by income level** are developed to understand the interaction between income and expenditures for elderly and near-retiree households (Section 3.1)
- **Aggregate household spending** is modeled over time under both the baseline and sufficient savings scenarios. Within the sufficient savings scenario, an adjustment is made to account for the dampening effect of additional savings by near-retiree households on spending (Section 3.2)
- **Economic impact** modeling is undertaken to estimate the total economic activity (including spillover effects) from differentials in household spending between scenarios (Section 3.3).
- **Revenue impacts** from differentials in income and economic activity for the state and other jurisdictions are estimated (Section 3.4).

## 3.1. Household Spending Patterns by Income Level

The income profile of Colorado's elderly households has implications for their disposable income and spending patterns. Granular survey data is used to develop spending profiles for elderly households in total and across twelve different expenditure categories. This analysis is based on national data for respondents age 65 or older in the Consumption and Activities Mail Survey (CAMS) within the Health and Retirement Study (HRS), a longitudinal national study which surveys the same households over time.[34]

### Total Household Spending

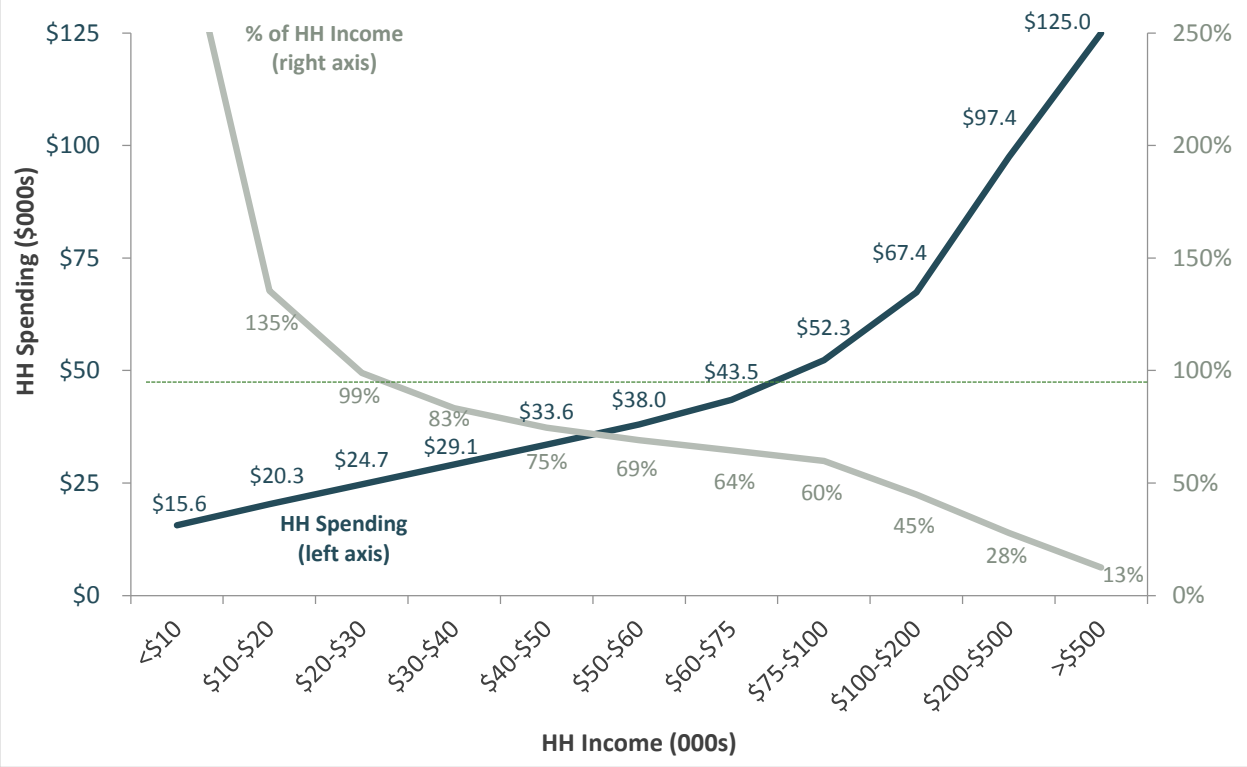
First, total expenditures are modeled by income band. Survey data on total household expenditures and incomes are "smoothed" using a linear trendline to model expenditures for households up to $100,000 in income. The trendline in expenditures as a share of income is then extrapolated to households with incomes above $100,000, and used to model spending by these households.

Household expenditures in total and as a share of household income are shown by income band in Figure 3.1.[35] As expected, household expenditures rise with household income (blue line). However, the proportion of income spent by household decreases as income increases (gray line), reflecting higher savings rates for wealthier households.

[34] The HRS is administered by the University of Michigan, and past data is made publicly available by the RAND Corporation. National data is used because sample sizes by income band are insufficient at the state level. Importantly, this national data is used only to determine the distribution of spending by category within a given income band, with spending patterns matched to the estimated income distribution of Colorado's senior households.

[35] Note that income bands accelerate in size as incomes increase. This leads to an acceleration in both trendlines for income bands beyond $100,000. Shown on a continuous basis, spending growth decelerates with income growth, as wealthier households spend a lower proportion of their available income (as reflected in the gray line).

Figure 3.1: Household Spending by Income Band for 65+ Households




*Source: ESI analysis of CAMS data*

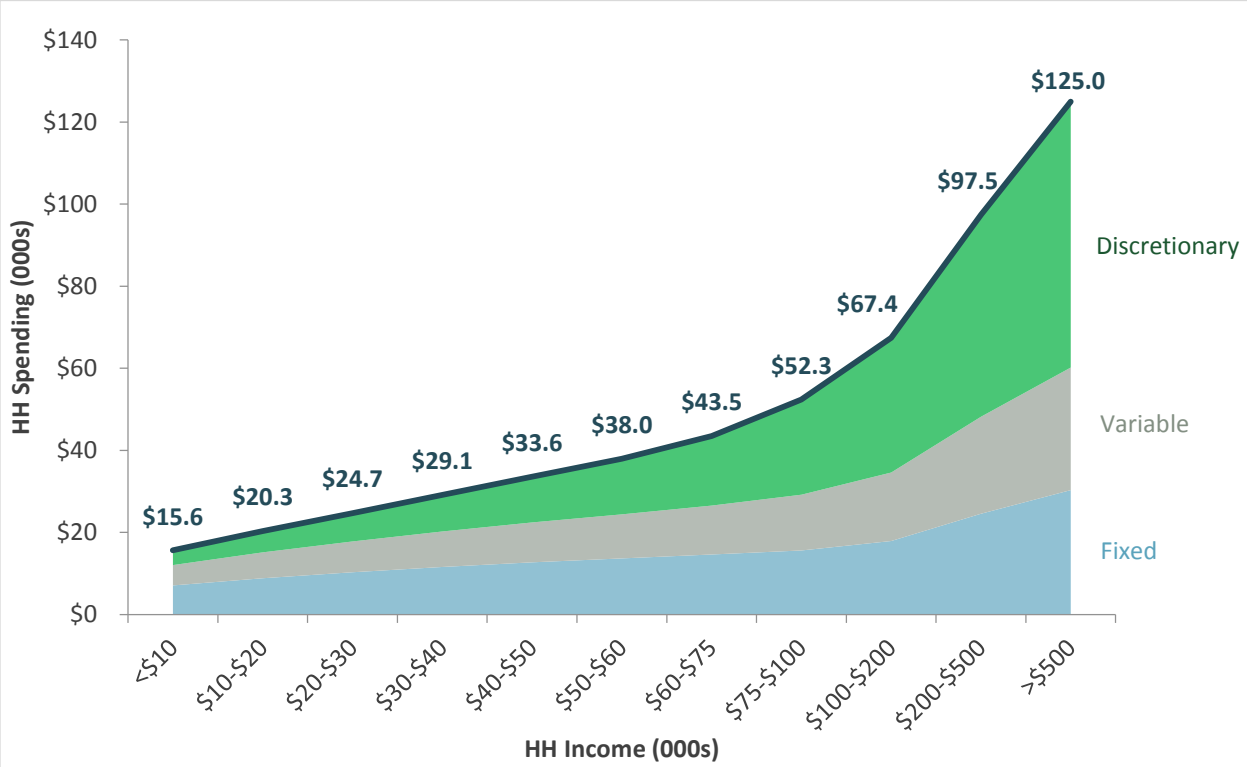
## Expenditures by Category

Expenditure patterns are then modeled by category. Twelve types of goods and services included in the CAMS survey data are grouped based on their relationship with income:

- Goods and services for which spending rises slowly with income are defined as **fixed** goods. These are items for which returns are diminishing as spending increases, with a limited amount of additional consumption as incomes increase. Examples include healthcare, food, and utilities.
- Goods and services for which spending rises at a similar rate to total spending are defined as **variable** goods. Examples include housing and automotive costs.
- Goods and services for which spending increases rapidly with income are defined as **discretionary** goods. Spending on these items is concentrated among higher income households with greater levels of discretionary income. Examples include donations, vacations, and hobbies.

Statistical analysis of CAMS survey data by income band establishes the proportion of total household spending allocated to each of the three goods and services groupings for each income band (see Figure 3.2).[36] Spending in each grouping grows as incomes increase, but the relative proportion of spending changes with income levels. For lower income households, fixed goods (in blue) represent the largest share of expenditures, but grow slowly with income. Discretionary goods (in green) represent a small share of expenditures for lower-income households but grow rapidly with income and represent the largest share of expenditures for wealthier households.

Figure 3.2: Household Spending Patterns by Expenditure Type for Elderly Households




*Source: ESI analysis of CAMS data*

[36] Note that this modeling approach builds on prior ESI analysis of expenditures patterns of elderly households within a study of the fiscal impacts of insufficient retirement savings in Pennsylvania. See: "The Impact of Insufficient Retirement Savings on the Commonwealth of Pennsylvania," January 2018. Appendix C in that analysis provides a detailed overview of this modeling approach. The approach is updated within this analysis through refinement of the income brackets utilized, and a re-estimation of fit line equations used to generate estimates.

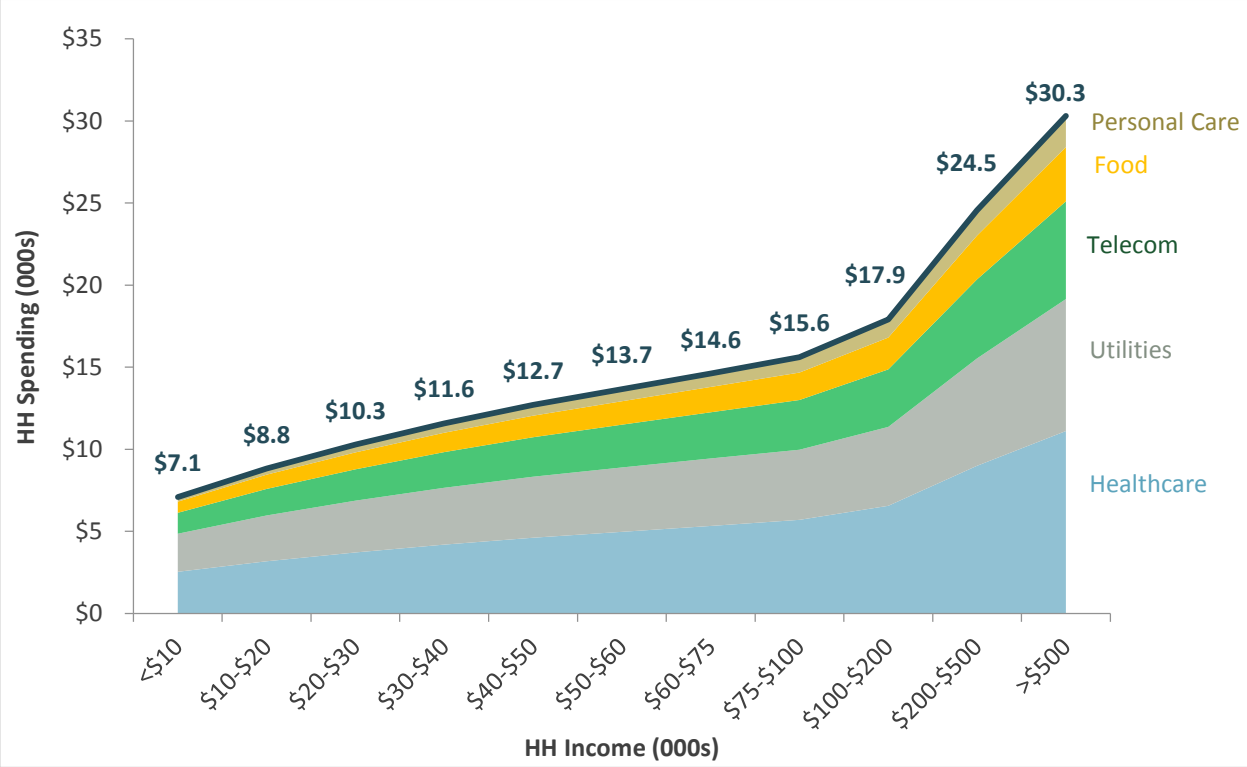
## Fixed Expenditures

Modeled expenditures are then allocated to categories of goods and services for each grouping. Allocations are again based on statistical relationships between income and expenditures in the CAMS survey data.[37]

Figure 3.3 shows spending by income band on fixed goods and services. Expenditures within this category rise slowly as income increases. Average expenditures on fixed goods and services for households with incomes between $75,000 and $100,000 total $15,600, roughly 1.5x the average expenditures of households within incomes between $20,000 and $30,000 ($10,300).

The largest expenditure categories are healthcare and utilities, followed by telecommunications, food, and personal care.

Figure 3.3: Household Spending by Elderly Households: Fixed Goods




*Source: ESI analysis of CAMS data*

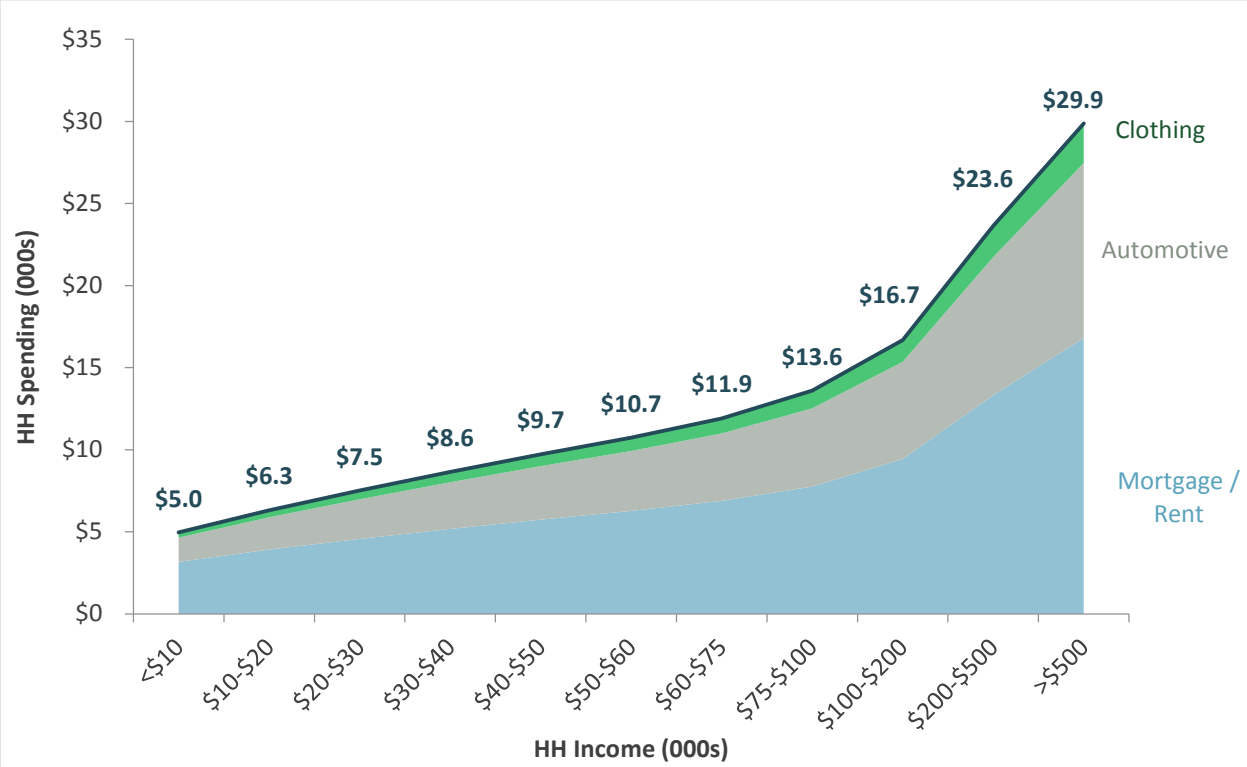
[37] Expenditures by category are first estimated as a linear function based on reported survey data by income band. These estimates are then calculated for each category as a proportion of total spending on fixed goods. These proportions are applied to the level of fixed spending estimated for each income band (based on the share of total household spending represented by this category, as estimated in Figure 3.1).

## Variable Expenditures

Figure 3.4 shows spending by income band on variable goods and services. Expenditures within this category rise modestly as income increases. Average expenditures on variable goods and services for households with incomes between $75,000 and $100,000 total $13,600, close to 2x the average expenditures of households within incomes between $20,000 and $30,000 ($7,500).

Expenditure types in this category include mortgage or rent payments (which represents the majority of spending), automotive costs, and clothing.

Figure 3.4: Household Spending by Elderly Households: Variable Goods



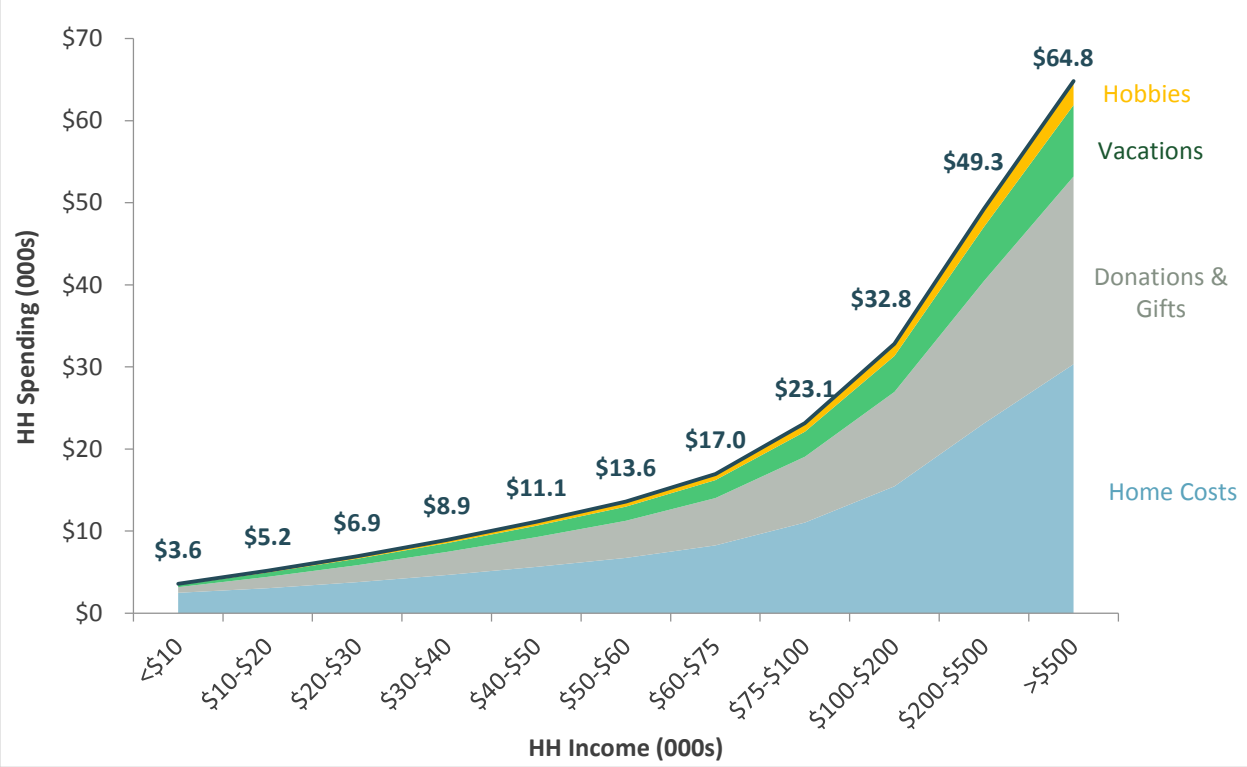

*Source: ESI analysis of CAMS data*

## Discretionary Expenditures

Figure 3.5 shows spending by income band on discretionary goods and services.[38] Expenditures within this category rise significantly as income increases. Average expenditures on discretionary goods and services for households with incomes between $75,000 and $100,000 total $23,100, nearly 4x the average expenditures of households within incomes between $20,000 and $30,000 ($6,900). Even larger increases are seen for upper income households, for whom these categories represent the majority of spending.

The largest expenditures in this category are home costs (including home goods, insurance, and property taxes) as well as donations and gifts, which increase sharply with income.

Figure 3.5: Household Spending by Elderly Households: Discretionary Goods




*Source: ESI analysis of CAMS data*

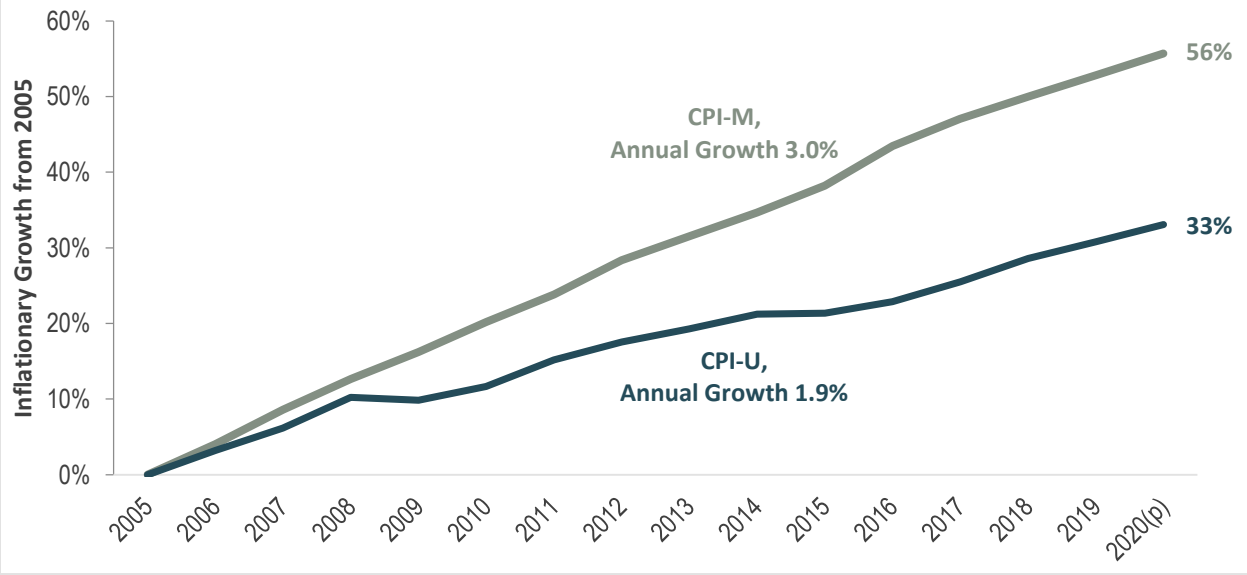
[38] Note that the name "Discretionary" in this context is used in reference to the relationship between expenditures in these categories and household income. This usage does not reflect on the necessity of any expenditure type for any particular household or income band.

## Accounting for Excess Medical Cost Growth

Per household spending by income band is assumed to stay constant into the future (with both incomes and spending expressed in constant $2020), but an adjustment to the distribution of spending is required to account for excess medical inflation. Costs for medical services have consistently risen faster than the cost of other goods for several decades, and are anticipated to continue to do so into the future. The differential between the growth in medical costs and other goods (excess medical inflation) crowds out other spending, and leads to an increase in per capita state costs for medical programs.

The increase in health care spending relative to other goods for households is modeled based on the historic relationship between the growth in CPI-M, the BLS measure of consumer costs for medical care, and CPI-U, the benchmark BLS measure of inflation across the economy. Over the 2005-2020 period, overall inflation grew 1.92 percent annually, while medical inflation grew by 2.99 percent, or 1.56x as fast (see Figure 3.6). This ratio is applied forward to the baseline projections of CPI-U issued by the Congressional Budget Office (CBO) to yield a forecast for excess medical inflation over the 2020-2035 analysis period.[39]

Figure 3.6: Medical Cost Inflation Relative to Overall Inflation, 2005-2020




*Source: ESI Analysis of BLS data*

Expenditures are re-allocated from goods in the discretionary and variable categories to account for additional health care spending, thus holding total expenditures per household constant. Figure 3.7 shows the difference in modeled expenditure patterns by income band for 2020 and 2035.

[39] Forecasts from the non-partisan CBO are drawn from the August 2019 *Update to the Budget and Economic Outlook: 2019-2029*. CPI projections for 2024-2029 are extended out to 2035 at the same rate.

Figure 3.7: Expenditures by Category and income for Elderly Households, 2020-2035 (in 000s - $2020)

***2020***

| Sector | < $10 | $10-$20 | $20-$30 | $30-$40 | $40-$50 | $50-$60 | $60-$75 | $75-$100 | $100-$200 | $200-$500 | > $500 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Healthcare | $2.54 | $3.18 | $3.71 | $4.19 | $4.61 | $4.97 | $5.33 | $5.70 | $6.56 | $9.00 | $11.11 |
| Utilities | $2.32 | $2.79 | $3.16 | $3.46 | $3.72 | $3.92 | $4.11 | $4.27 | $4.81 | $6.54 | $8.04 |
| Telecom | $1.28 | $1.62 | $1.91 | $2.17 | $2.41 | $2.61 | $2.81 | $3.03 | $3.50 | $4.81 | $5.95 |
| Food | $0.68 | $0.87 | $1.03 | $1.18 | $1.31 | $1.43 | $1.54 | $1.67 | $1.94 | $2.67 | $3.30 |
| Personal Care | $0.27 | $0.38 | $0.48 | $0.58 | $0.66 | $0.74 | $0.83 | $0.93 | $1.10 | $1.53 | $1.90 |
| Mortgage/Rent | $3.17 | $3.92 | $4.57 | $5.17 | $5.74 | $6.27 | $6.89 | $7.76 | $9.44 | $13.32 | $16.81 |
| Automotive | $1.48 | $1.97 | $2.41 | $2.85 | $3.26 | $3.65 | $4.11 | $4.76 | $5.92 | $8.41 | $10.66 |
| Clothing | $0.31 | $0.43 | $0.53 | $0.63 | $0.72 | $0.81 | $0.92 | $1.07 | $1.33 | $1.90 | $2.41 |
| Home Costs | $2.48 | $3.04 | $3.77 | $4.65 | $5.63 | $6.73 | $8.25 | $11.03 | $15.45 | $23.12 | $30.33 |
| Donate/Gifts | $0.69 | $1.38 | $2.07 | $2.81 | $3.63 | $4.52 | $5.76 | $8.02 | $11.51 | $17.35 | $22.87 |
| Vacation | $0.26 | $0.53 | $0.79 | $1.07 | $1.38 | $1.72 | $2.19 | $3.05 | $4.38 | $6.60 | $8.70 |
| Hobbies | $0.15 | $0.22 | $0.30 | $0.39 | $0.49 | $0.61 | $0.76 | $1.04 | $1.48 | $2.22 | $2.92 |
| **Total Spend** | **$15.62** | **$20.31** | **$24.73** | **$29.15** | **$33.57** | **$37.98** | **$43.50** | **$52.34** | **$67.41** | **$97.47** | **$125.00** |

***2035***

| Sector | < $10 | $10-$20 | $20-$30 | $30-$40 | $40-$50 | $50-$60 | $60-$75 | $75-$100 | $100-$200 | $200-$500 | > $500 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Healthcare | $3.07 | $3.85 | $4.50 | $5.08 | $5.58 | $6.02 | $6.45 | $6.90 | $7.94 | $10.89 | $13.45 |
| Utilities | $2.32 | $2.79 | $3.16 | $3.46 | $3.72 | $3.92 | $4.11 | $4.27 | $4.81 | $6.54 | $8.04 |
| Telecom | $1.28 | $1.62 | $1.91 | $2.17 | $2.41 | $2.61 | $2.81 | $3.03 | $3.50 | $4.81 | $5.95 |
| Food | $0.68 | $0.87 | $1.03 | $1.18 | $1.31 | $1.43 | $1.54 | $1.67 | $1.94 | $2.67 | $3.30 |
| Personal Care | $0.27 | $0.38 | $0.48 | $0.58 | $0.66 | $0.74 | $0.83 | $0.93 | $1.10 | $1.53 | $1.90 |
| Mortgage/Rent | $3.06 | $3.78 | $4.41 | $5.00 | $5.55 | $6.07 | $6.67 | $7.53 | $9.18 | $12.97 | $16.37 |
| Automotive | $1.42 | $1.90 | $2.33 | $2.75 | $3.15 | $3.53 | $3.98 | $4.63 | $5.76 | $8.19 | $10.38 |
| Clothing | $0.30 | $0.41 | $0.51 | $0.61 | $0.70 | $0.79 | $0.89 | $1.04 | $1.30 | $1.85 | $2.35 |
| Home Costs | $2.23 | $2.78 | $3.49 | $4.34 | $5.30 | $6.38 | $7.89 | $10.65 | $15.02 | $22.52 | $29.59 |
| Donate/Gifts | $0.62 | $1.26 | $1.91 | $2.62 | $3.42 | $4.29 | $5.51 | $7.75 | $11.18 | $16.90 | $22.32 |
| Vacation | $0.24 | $0.48 | $0.73 | $1.00 | $1.30 | $1.63 | $2.09 | $2.95 | $4.25 | $6.43 | $8.49 |
| Hobbies | $0.13 | $0.20 | $0.28 | $0.37 | $0.47 | $0.57 | $0.73 | $1.00 | $1.43 | $2.16 | $2.85 |
| **Total Spend** | **$15.62** | **$20.31** | **$24.73** | **$29.15** | **$33.57** | **$37.98** | **$43.50** | **$52.34** | **$67.41** | **$97.47** | **$125.00** |

*Source: ESI analysis of CAMS data*

## Accounting for Savings by Near-Retiree Households

As outlined in Section 1.3, modeling of the income distribution of Colorado's elderly households indicates an average gap in available annual income during retirement years of around $5,100 in 2020 and $4,600 in 2035 for households with less than $100,000 in income. Framed another way, households would have to generate additional savings during their working years to generate this level of additional available income each year in retirement in order to achieve the sufficient savings scenario outlined in this report.

This analysis pursues a hypothetical scenario in which these income increases are achieved as a basis for analyzing the fiscal and economic impacts that would result from increased savings, without evaluating the effect of any specific policy intervention on achieving a particular level of retirement income. However, if these increases are achieved by increasing the level of annual savings for households during their working years, a decrease in spending may result for non-senior households. Since this effect would partially offset the additional spending of elderly households (who have realized the additional income), it is reasonable to account for this factor within the household spending analysis. This adjustment, in effect, makes the household spending component into a "net" rather than "gross" analysis.

### Implied Savings Levels

Offsetting savings levels for near-retiree households are modeled by estimating the accumulated savings needed to reach the targeted income levels for each household under standard investment accumulation and drawdown assumptions. Figure 3.8 details these inputs, and illustrates average results for near-retiree households with less than $75,000 in annual income.

Annual income gaps are first translated to a lump sum savings amount based on a drawdown rate of 4.5 percent per year.[40] Closing the average household income gap for 2020 of around $4,800 at a drawdown rate requires a lump sum savings of around $107,000 upon retirement.

Next, a fixed annual contribution that would be required over a standard 30 year savings and accumulation period to achieve the targeted lump sum is calculated. Figure 3.8 illustrates this calculation under both a moderate return scenario of 6.5 percent, and a more aggressive return scenario of 8.5 percent.[41] Achieving the targeted lump sum would require an annual savings of $1,163 under the moderate return scenario, and $794 under the more aggressive return scenario.[42] The moderate return

[40] This rate follows industry standard assumptions of 4-5% drawdown, which are in turn based on average 20-25 year expected retirement period. See for example: Fidelity Investments Viewpoints: "How can I make my retirement savings last?"

[41] These rates fall with the expected range of moderate and aggressive returns on investment for mutual funds. See for example: The Balance. "Mutual Fund Portfolio Examples for 3 Types of Investments."

[42] Notably, the annual contribution is significantly below the annual drawdown due to the power of compounding returns to savings over time. Under the moderate returns assumption, average annual contributions of $1,163 are about 1/4 of the average additional income of $4,15 yielded in retirement. This differential is another means of expressing the potential financial gains to individual households of increasing their savings levels during their working age years (under standard investment assumptions).

scenario is used as the basis for calculating reduced spending for near-retiree households attributable to increased savings.

This calculation is repeated for each near-retiree (50-64) household in 2020 and 2035 to determine reductions in disposable income for each income band across the population.[43] These implied savings levels by income band are then matched to the expenditure profiles (shown in Figure 3.9) to estimate the dampening effect of savings on household expenditures by category.

Figure 3.8: Reduced Household Spending due to Savings by Near-Retiree Households

| Sector | 2020 | 2035 | Basis |
|---|---|---|---|
| Average Income Differential | $4,815 | $5,163 | Income Replacement Model (among HH <$75,000) |
| Annual Drawdown Share | 4.5% | 4.5% | Recommended annual level (20-25 year average retirement period) |
| Average Lump Sum Amount | $106,990 | $114,738 | Income Differential / Drawdown Share |
| Years of Savings | 30 | 30 | Assumption |
| Investment Return – Aggressive | 6.5% | 6.5% | Assumption |
| Investment Return – Moderate | 8.5% | 8.5% | Assumption |
| Annual Savings – Aggressive Return | $794 | $851 | Annual contribution to achieve lump sum at return rate |
| **Annual Savings – Moderate Return** | **$1,163** | **$1,247** | |

## Expenditure Pattern

Spending profiles are developed for near-retirees households by income band using a parallel approach to the expenditure modeling undertaken for elderly households. The effect of additional savings by these households is modeled as a function of these expenditure patterns, thereby incorporating the differential between spending patterns of working age and elderly households.

Figure 3.9 shows differences in the distribution of spending by category between elderly (65+) and near-retiree (50-64) households by income band, based on modeling of CAMS survey data. Across income levels, near-retiree households generally spend a larger share of their incomes on their mortgage or rent and automotive costs than elderly households (as elderly households may be more likely to have paid off their mortgages, and may be less likely to drive than near-retiree households). By contrast, near-retiree households spend a lower portion of their income on healthcare and discretionary spending categories.

[43] Note that this calculation models potential reductions in savings for the number of working age (50-64) households as the projected number of retiree households in 2020 and 2035. While the flow of working age versus retiree households at any given point in time will differ, this approach maintains symmetry between the additional savings and additional available income for any given household, creating an appropriate comparison for analytical purposes.

Figure 3.9: Household Spending Profile for Near-Retiree and Elderly Households, 2020

***Elderly Households (65+)***

| Sector | < $10 | $10-$20 | $20-$30 | $30-$40 | $40-$50 | $50-$60 | $60-$75 | $75-$100 | $100-$200 | $200-$500 | > $500 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Healthcare | 16.2% | 15.6% | 15.0% | 14.4% | 13.7% | 13.1% | 12.2% | 10.9% | 9.7% | 9.2% | 8.9% |
| Utilities | 14.8% | 13.7% | 12.8% | 11.9% | 11.1% | 10.3% | 9.5% | 8.2% | 7.1% | 6.7% | 6.4% |
| Telecom | 8.2% | 8.0% | 7.7% | 7.5% | 7.2% | 6.9% | 6.5% | 5.8% | 5.2% | 4.9% | 4.8% |
| Food | 4.3% | 4.3% | 4.2% | 4.0% | 3.9% | 3.8% | 3.6% | 3.2% | 2.9% | 2.7% | 2.6% |
| Personal Care | 1.8% | 1.9% | 1.9% | 2.0% | 2.0% | 2.0% | 1.9% | 1.8% | 1.6% | 1.6% | 1.5% |
| Mortgage/Rent | 20.3% | 19.3% | 18.5% | 17.7% | 17.1% | 16.5% | 15.8% | 14.8% | 14.0% | 13.7% | 13.4% |
| Automotive | 9.5% | 9.7% | 9.8% | 9.8% | 9.7% | 9.6% | 9.4% | 9.1% | 8.8% | 8.6% | 8.5% |
| Clothing | 2.0% | 2.1% | 2.1% | 2.2% | 2.2% | 2.1% | 2.1% | 2.0% | 2.0% | 1.9% | 1.9% |
| Home Costs | 15.9% | 15.0% | 15.3% | 15.9% | 16.8% | 17.7% | 19.0% | 21.1% | 22.9% | 23.7% | 24.3% |
| Donate/Gifts | 4.4% | 6.8% | 8.4% | 9.6% | 10.8% | 11.9% | 13.2% | 15.3% | 17.1% | 17.8% | 18.3% |
| Vacation | 1.7% | 2.6% | 3.2% | 3.7% | 4.1% | 4.5% | 5.0% | 5.8% | 6.5% | 6.8% | 7.0% |
| Hobbies | 1.0% | 1.1% | 1.2% | 1.4% | 1.5% | 1.6% | 1.7% | 2.0% | 2.2% | 2.3% | 2.3% |

***Near-Retiree Households (50-64)***

| Sector | < $10 | $10-$20 | $20-$30 | $30-$40 | $40-$50 | $50-$60 | $60-$75 | $75-$100 | $100-$200 | $200-$500 | > $500 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Healthcare | 10.3% | 10.7% | 10.9% | 10.9% | 10.8% | 10.7% | 10.5% | 10.2% | 9.8% | 9.6% | 9.5% |
| Utilities | 14.8% | 13.2% | 12.1% | 11.3% | 10.7% | 10.1% | 9.5% | 8.7% | 8.1% | 7.9% | 7.7% |
| Telecom | 6.6% | 7.2% | 7.5% | 7.6% | 7.7% | 7.7% | 7.6% | 7.4% | 7.2% | 7.1% | 7.0% |
| Food | 4.0% | 4.0% | 3.9% | 3.9% | 3.8% | 3.7% | 3.7% | 3.5% | 3.3% | 3.3% | 3.2% |
| Personal Care | 2.3% | 2.1% | 2.0% | 1.8% | 1.7% | 1.7% | 1.6% | 1.4% | 1.4% | 1.3% | 1.3% |
| Mortgage/Rent | 26.7% | 26.2% | 25.6% | 25.1% | 24.6% | 24.0% | 23.4% | 22.4% | 21.5% | 21.1% | 20.9% |
| Automotive | 14.0% | 14.0% | 13.8% | 13.6% | 13.4% | 13.2% | 12.9% | 12.4% | 11.9% | 11.7% | 11.6% |
| Clothing | 3.0% | 2.9% | 2.8% | 2.7% | 2.6% | 2.5% | 2.4% | 2.3% | 2.2% | 2.2% | 2.1% |
| Home Costs | 13.5% | 12.8% | 13.1% | 13.7% | 14.4% | 15.1% | 16.1% | 17.8% | 19.3% | 19.9% | 20.3% |
| Donate/Gifts | 2.5% | 3.4% | 4.0% | 4.4% | 4.8% | 5.2% | 5.7% | 6.5% | 7.1% | 7.4% | 7.5% |
| Vacation | 2.0% | 2.8% | 3.2% | 3.6% | 3.9% | 4.2% | 4.6% | 5.2% | 5.7% | 5.9% | 6.1% |
| Hobbies | 0.2% | 0.8% | 1.1% | 1.4% | 1.6% | 1.7% | 1.9% | 2.2% | 2.5% | 2.6% | 2.7% |

*Source: ESI analysis of CAMS data*

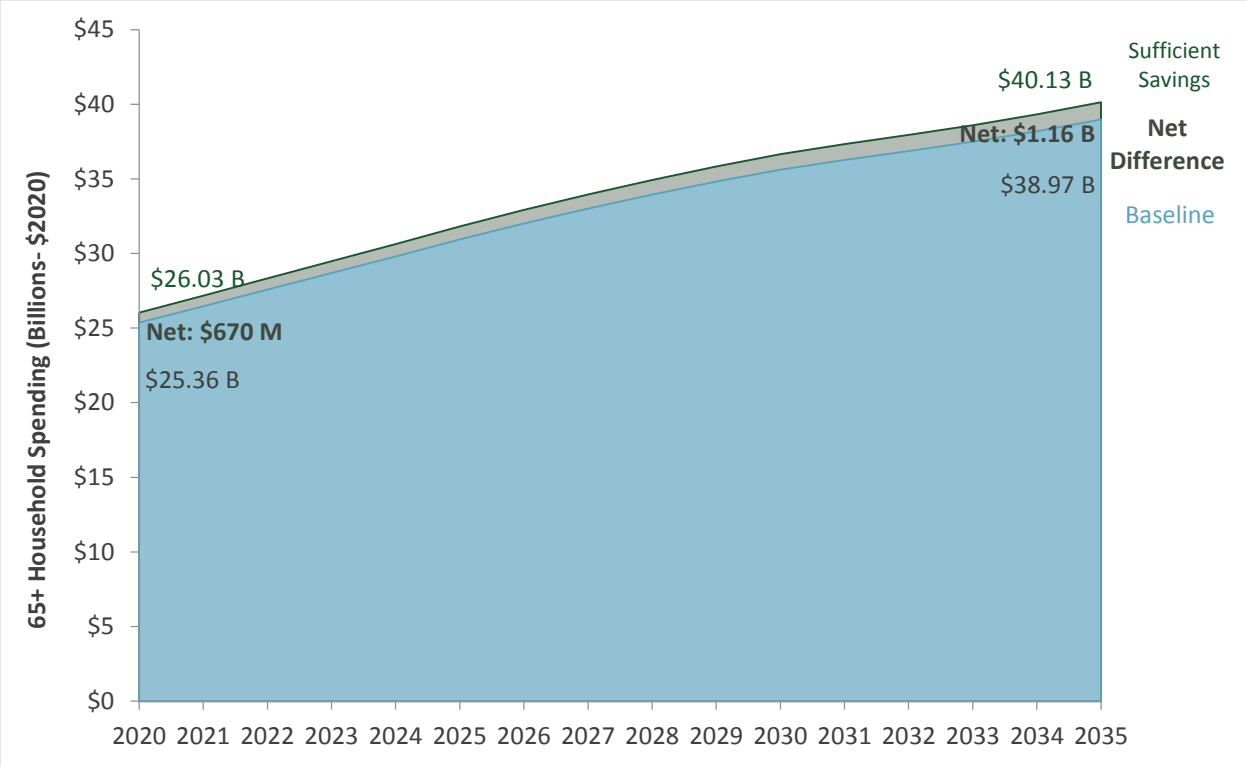
## 3.2. Household Spending by Scenario

### Expenditures by Elderly Households

The household spending profiles for 2020 and 2035 described in Section 3.1 are matched to the demographic and income scenarios to estimate aggregate spending by Colorado's elderly households.

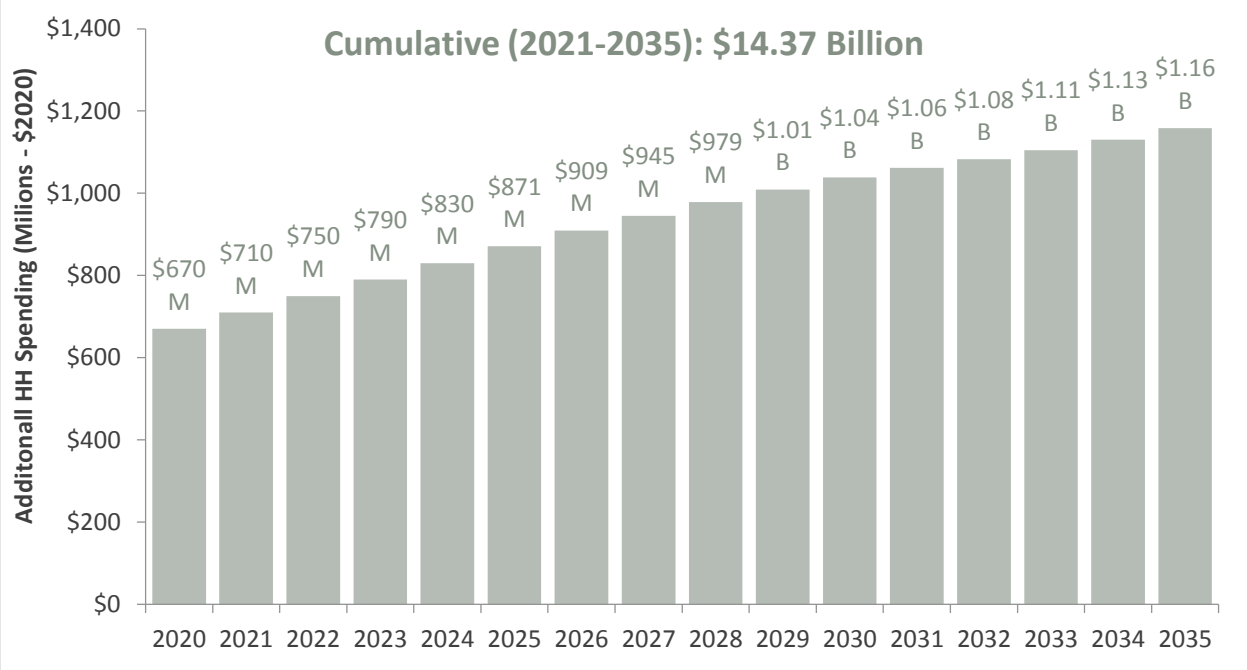
Based on this approach, Colorado's elderly households are anticipated to spend $25.36 billion in the baseline scenario in 2020, rising to $38.97 billion by 2035. This increase is due to demographic change alone, since the baseline scenario assumes a continuation of retirement savings behavior, and expenditures are expressed in constant dollars ($2020). In the sufficient savings scenario, Colorado's elderly households are modeled to spend $26.03 billion in 2020, rising to $40.13 billion by 2035 (see Figure 3.10).

Figure 3.10: Direct Spending by Elderly Households by Scenario, 2020-2035 (in Billions - $2020)




The gap between these scenarios represents the increase in household spending attributable to the modeled increase in retirement savings. This gap grows from $670 million in 2020 to $1.16 billion in 2035, and totals $14.37 billion over the fifteen year period from 2021-2035 (see Figure 3.11).

Figure 3.11: Elderly Household Spending Differential from Insufficient Savings, 2020-2035 ($2020)




## Accounting for Savings by Near-Retiree Households

As described in Section 3.1, an adjustment to the household spending calculation is undertaken to account for dampening effect of additional savings on the expenditures of near-retiree households in the "sufficient savings" scenario. This effect is accounted for by estimating the level of annual savings during working years needed to move households from the baseline to sufficient savings scenario under standard investment return assumptions, and modeling these annual savings as a decrease in household spending. Household expenditures by category are based on analysis of CAMS data on the expenditure patterns near-retiree households.

Figure 3.12 shows the impact of accounting for near-retiree savings on the incremental household spending generated under the sufficient savings scenario relative to the baseline scenario. As shown in Figure 3.11, elderly households are anticipated to spend an additional $14.37 billion over the fifteen year period in the sufficient savings scenario. From this total, a deduction of $7.46 billion is made to account for reduced spending by near-retiree households due to increased savings levels.[44]

[44] Note that while the annual savings levels represent only about one-quarter of the additional income yielded in retirement, aggregate household spending gains fall by around one-half when accounting for the savings of near-retiree households. This differential occurs because modeling treats every marginal dollar of savings by near-retiree households as equating to a lost dollar of spending, while only a portion of each marginal dollar of income for retirees is estimated to circulate as household spending (based on existing expenditure patterns by income band as reviewed in Figure 3.1). In addition, this analysis does not account for the favorable tax treatment of additional savings by near-retiree households. In these respects, the analysis takes a conservative approach to estimating the incremental household spending impacts.

The net differential in household spending therefore totals $6.91 billion over the fifteen year period, growing from $329 million in 2021 to $553 million in 2035 (see Figure 3.12 and Figure 3.13).

Figure 3.12: Household Spending Impact from Insufficient Savings, 2020-2035 ($2020)

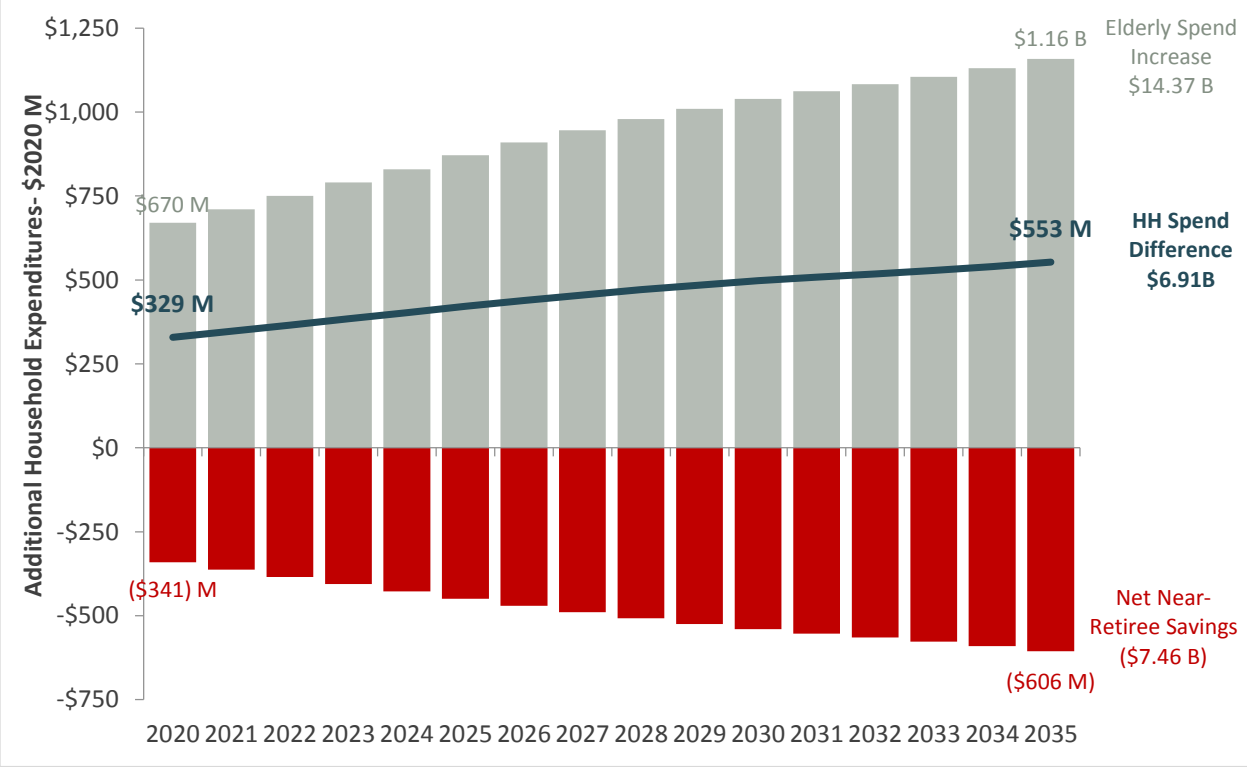



Figure 3.13: Net Household Spending Impact from Insufficient Savings, 2020-2035 ($2020)

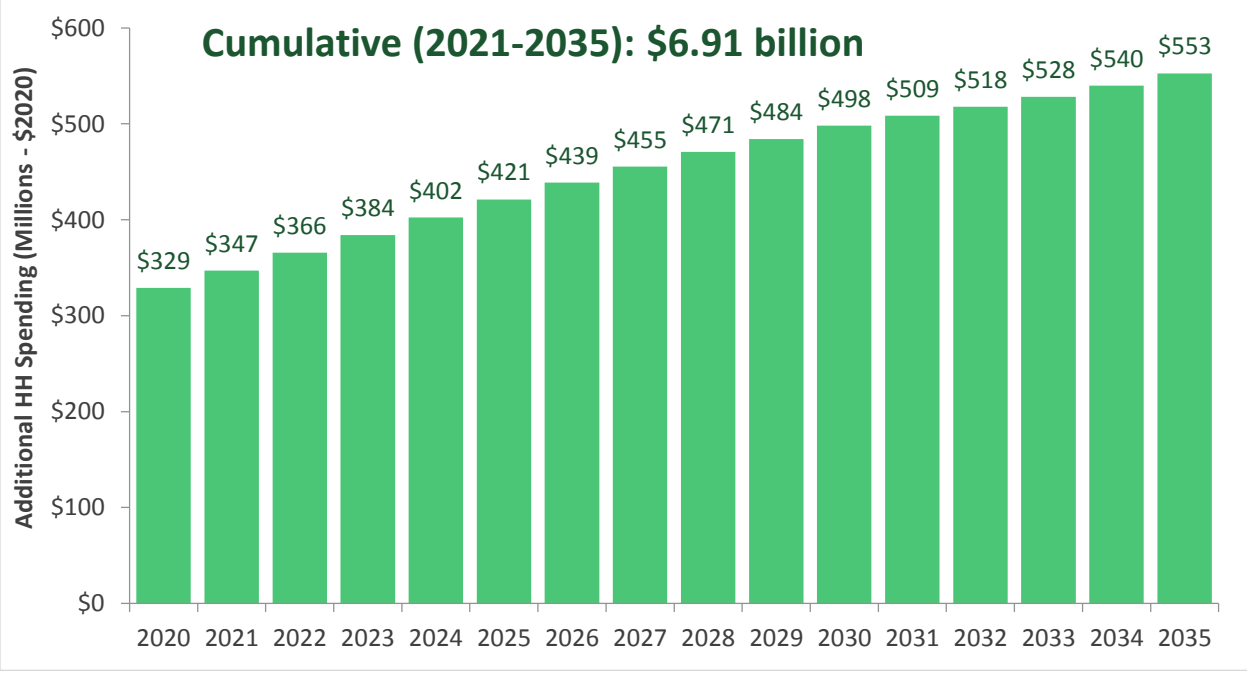


Figure 3.14 breaks down the modeled difference in household spending between scenarios by category. First, net differences are shown between income scenarios in expenditures by elderly households ("Elderly Chg"). Next, deductions are shown by scenario for decreases in spending by near-retiree households ("Near-Retiree Chg") in 2020, in 2035, and cumulatively across the fifteen year period. Finally, incremental spending is shown by category and scenario inclusive of this adjustment ("Incremental Spend").

Additional spending totals are therefore a function of both differentials between income scenarios for elderly households and differentials in spending patterns between elderly and near-retiree households. Categories such as utilities, telecommunications, and mortgage or rent generate significant incremental expenditures by elderly households between income scenarios, but also experience significant deductions for near-retiree savings, due the greater propensity of near-retiree households to spending on these goods relative to elderly households. By contrast, discretionary goods, such as home costs and donations and gifts, generate the largest incremental effects due to significant differences in spending between income scenarios combined with a higher proportion of spending by elderly households relative to near-retiree households.

Figure 3.14: Spending Differential by Sector from Insufficient Savings ($2020)

| Sector | Elderly Chg 2020 | Elderly Chg 2035 | Elderly Chg Cumulative | Near-Retiree Chg 2020 | Near-Retiree Chg 2035 | Near-Retiree Chg Cumulative |
|---|---|---|---|---|---|---|
| Healthcare ($M) | $63 | $126 | $1,495 | ($36) | ($77) | ($894) |
| Utilities ($M) | $39 | $65 | $815 | ($34) | ($61) | ($749) |
| Telecommunications ($M) | $35 | $58 | $726 | ($26) | ($45) | ($558) |
| Food ($M) | $20 | $33 | $411 | ($13) | ($22) | ($274) |
| Personal Care ($M) | $13 | $21 | $268 | ($6) | ($10) | ($123) |
| Mortgage / Rent ($M) | $87 | $143 | $1,804 | ($81) | ($141) | ($1,747) |
| Automotive ($M) | $62 | $103 | $1,290 | ($45) | ($77) | ($956) |
| Clothing ($M) | $14 | $24 | $297 | ($9) | ($15) | ($184) |
| Home Costs ($M) | $148 | $258 | $3,194 | ($53) | ($91) | ($1,139) |
| Donations & Gifts ($M) | $126 | $218 | $2,709 | ($18) | ($31) | ($390) |
| Vacation ($M) | $48 | $83 | $1,030 | ($15) | ($25) | ($314) |
| Hobbies ($M) | $15 | $27 | $330 | ($6) | ($10) | ($129) |
| **Total** | **$670 M** | **$1.16 B** | **$14.37 B** | **($341 M)** | **($606 M)** | **$7.46 B** |

***Accounting for Near-Retiree Savings***

| Sector | Type | Incremental Spend 2020 | Incremental Spend 2035 | Incremental Spend Cumulative |
|---|---|---|---|---|
| Healthcare ($M) | Fixed | $27 | $50 | $601 |
| Utilities ($M) | Fixed | $5 | $4 | $66 |
| Telecommunications ($M) | Fixed | $9 | $13 | $168 |
| Food ($M) | Fixed | $7 | $10 | $136 |
| Personal Care ($M) | Fixed | $7 | $11 | $146 |
| Mortgage / Rent ($M) | Variable | $5 | $3 | $57 |
| Automotive ($M) | Variable | $18 | $26 | $334 |
| Clothing ($M) | Variable | $6 | $9 | $113 |
| Home Costs ($M) | Discretionary | $94 | $166 | $2,055 |
| Donations & Gifts ($M) | Discretionary | $108 | $187 | $2,320 |
| Vacation ($M) | Discretionary | $33 | $58 | $716 |
| Hobbies ($M) | Discretionary | $9 | $16 | $202 |
| **Total** | | **$329 Million** | **$553 Million** | **$6.91 Billion** |

## 3.3. Economic Impact from Household Spending

Next, economic modeling is undertaken to estimate the impact of the differential in household spending due to insufficient savings on the Colorado economy.

The first step in this process is to isolate the proportion of spending taking place locally by excluding out of state spending. Leakage of spending outside of the state economy can take the form of transactions physically made in another state (whether on vacation or in a neighboring state in the normal course of activity) or transactions that take place electronically to an out of state recipient (such as online retailers, or the recipients of some gifts and donations). The degree of leakage is estimated to be larger for certain goods like vacations which lend themselves to a greater degree of out of state spending, and for items like clothing that are more commonly purchased through an electronic retailer.

Figure 3.15 shows the resulting estimates of in state expenditure differences between income scenarios. Among elderly households, additional in state spending in the sufficient savings scenario is estimated at $554 million in 2020, or 83 percent of the total household spending estimate of $670 million. The in-state expenditures gap grows to $956 million in 2035, and totals $11.86 billion over the fifteen year period from 2021-2035. When accounting for the effects of the savings of near-retiree households, additional in-state expenditures are estimated to total $243 million in 2020, or 74 percent of the total household spending of $329 million.[45]

For the purpose of economic impact modeling, an additional adjustment is needed to account for the difference between wholesale and retail prices of certain goods.[46] A “retail margin” adjustment is made to insure that economic modeling includes only the proportion of the purchase price that recirculates locally.

With both of these adjustments, the direct effect of incremental spending by elderly households in the sufficient savings scenario is $505 million in 2020. This figure grows to $875 million in 2035, and totals $10.84 billion over the fifteen year period from 2021-2035.

Accounting for the increased savings of near-retiree households, the direct effect within the Colorado economy from household spending is $218 million in 2020. This figure grows to $363 million in 2035, and totals $4.55 billion over the fifteen year period from 2021-2035.

[45] The gap in the proportion of expenditures taking place within the state is driven by the differing composition of additional spending when accounting for near-retiree savings, as illustrated in Figure 3.14. In particular, discretionary categories like donation and gifts, and vacations that have a lower in-state retention proportion make up a larger share of additional expenditures when accounting for near-retiree savings, decreases the overall in-state share of spending.

[46] Items sold at a store are typically purchased from a wholesaler who derives some of the economic value through the production process, while the economic value added by retailers is only the “margin” by which the sales price exceeds their purchase price from their supplier. When the goods are not sourced locally, only this margin recirculates within the local economy.

Figure 3.15: Household Spending Differential from Insufficient Savings – in State Portion ($2020)

***Elderly Households Only***

| Sector | 2020 | 2035 | Est. In State Share | In State 2020 | In State 2035 | In State Cumulative |
|---|---|---|---|---|---|---|
| Healthcare ($M) | $63 | $126 | 95% | $60 | $120 | $1,420 |
| Utilities ($M) | $39 | $65 | 100% | $39 | $65 | $815 |
| Telecommunications ($M) | $35 | $58 | 95% | $33 | $55 | $689 |
| Food ($M) | $20 | $33 | 95% | $19 | $31 | $390 |
| Personal Care ($M) | $13 | $21 | 95% | $12 | $20 | $255 |
| Mortgage / Rent ($M) | $87 | $143 | 100% | $87 | $143 | $1,804 |
| Automotive ($M) | $62 | $103 | 95% | $59 | $97 | $1,225 |
| Clothing ($M) | $14 | $24 | 50% | $7 | $12 | $148 |
| Home Costs ($M) | $148 | $258 | 100% | $148 | $258 | $3,194 |
| Donations & Gifts ($M) | $126 | $218 | 50% | $63 | $109 | $1,355 |
| Vacation ($M) | $48 | $83 | 25% | $12 | $21 | $258 |
| Hobbies ($M) | $15 | $27 | 95% | $15 | $25 | $314 |
| **Total** | **$670 M** | **$1.16 B** | | **$554 M** | **$957 M** | **$11.87 B** |
| (Retail Margin) | | | | (48 M) | ($82 M) | ($1.03 B) |
| **Direct Total** | | | | **$505 M** | **$875 M** | **$10.84 B** |

***Accounting for Near-Retiree Savings***

| Sector | 2020 | 2035 | Est. In State Share | In State 2020 | In State 2035 | In State Cumulative |
|---|---|---|---|---|---|---|
| Healthcare ($M) | $27 | $50 | 95% | $26 | $47 | $571 |
| Utilities ($M) | $5 | $4 | 100% | $5 | $4 | $66 |
| Telecommunications ($M) | $9 | $13 | 95% | $9 | $12 | $159 |
| Food ($M) | $7 | $10 | 95% | $7 | $10 | $130 |
| Personal Care ($M) | $7 | $11 | 95% | $7 | $11 | $138 |
| Mortgage / Rent ($M) | $5 | $3 | 100% | $5 | $3 | $57 |
| Automotive ($M) | $18 | $26 | 95% | $17 | $24 | $317 |
| Clothing ($M) | $6 | $9 | 50% | $3 | $4 | $56 |
| Home Costs ($M) | $94 | $166 | 100% | $94 | $166 | $2,055 |
| Donations & Gifts ($M) | $108 | $187 | 50% | $54 | $93 | $1,160 |
| Vacation ($M) | $33 | $58 | 25% | $8 | $14 | $179 |
| Hobbies ($M) | $9 | $16 | 95% | $9 | $15 | $191 |
| **Total** | **$329 M** | **$553 M** | | **$243 M** | **$405 M** | **$5.08 B** |
| (Retail Margin) | | | | (25 M) | ($42 M) | ($529 M) |
| **Direct Total** | | | | **$218 M** | **$363 M** | **$4.55 B** |

These direct expenditures spur additional spillover effects within the state economy. In an inter-connected economy, every dollar spent generates two spillover impacts:

- First, some amount of the proportion of that expenditure that goes to the purchase of goods and services gets circulated back into an economy when those goods and services are purchased from Colorado vendors. This represents what is called the "*indirect effect*," and reflects the fact that in-state purchases of goods and services support in-state vendors, who in turn require additional purchasing with their own set of vendors.
- Second, some amount of the proportion of that expenditure that goes to labor income gets circulated back into an economy when those employees spend some of their earnings on various goods and services. This represents what is called the *"induced effect*," and reflects the fact that some of those goods and services will be purchased from in-state vendors, further stimulating the Colorado economy.

The role of input-output models is to determine the linkages across industries in order to model the magnitude and composition of the spillover impacts across the economy. The total economic impact of household spending is expressed as the sum of direct and spillover (indirect + induced) impacts. Results are estimated using a customized impact model of the Colorado economy using the industry-standard IMPLAN modeling framework.[47]

IMPLAN also generates estimates of the level of employment and earnings supported by direct and spillover economic activity. Employment is expressed in "job-years," which are converted to full-time equivalent (FTE) positions using industry-specific ratios.[48] Employee compensation represents both salary and benefits.

[47] IMPLAN is produced and licensed by the Minnesota IMPLAN Group. IMPLAN has developed a social accounting matrix (SAM) that accounts for the flow of commodities through economies. From this matrix, IMPLAN also determines the regional purchase coefficient (RPC), the proportion of local supply that satisfies local demand. These values not only establish the types of goods and services supported by an industry or institution, but also the level in which they are acquired locally. This assessment determines the multiplier basis for the local and regional models created in the IMPLAN modeling system.

[48] When calculated over multi-year period, "job-years" should be understood as an aggregation of individual years of employment, rather than a number of unique positions. For example, the total of 153,050 job years over fifteen years expressed in Figure 15 could also be understood as an average of 10,200 annual jobs for fifteen years.

Inclusive of spillover effects, the additional expenditures by elderly households in the sufficient savings scenario as estimated to generate $949 million in economic impact in the Colorado economy in 2020. This activity would support 7,010 FTE jobs, with earnings of $275 million. This differential is modeled to grow to $1.65 billion by 2035, supporting 12,290 FTE jobs with $481 million in earnings. Cumulatively over the fifteen year 2021-2035 period, this differential represents $20.42 billion in total economic impact, 151,770 job-years (or 10,120 FTE jobs per year) and $5.95 billion in earnings.

When accounting for savings by near-retiree households, the economic impact of additional expenditures is estimated at $431 million, supporting 3,570 FTE jobs with $141 million in earnings. This differential is modeled to grow to $724 million by 2035, supporting 6,130 FTE jobs with $241 million in earnings. Cumulatively over the fifteen year 2021-2035 period, this differential represents $9.06 billion in total economic impact, 76,160 job-years (or 5,080 FTE jobs per year) and $3.00 billion in earnings (see Figure 3.16).

Figure 3.16: Economic Impact of Household Spending Differential from Insufficient Savings ($2020)

***Elderly Households Only***

| Impact Type | 2020 | 2035 | Cumulative |
|---|---|---|---|
| Direct Output ($M) | $505 | $875 | $10.84 billion |
| Indirect & Induced Output ($M) | $444 | $774 | $9.57 billion |
| **Total Impact** | **$949 million** | **$1.65 billion** | **$20.42 billion** |
| **Employment (FTE)** | **7,010 jobs** | **12,290 jobs** | **151,770 job-years** |
| **Employee Compensation** | **$275 million** | **$481 million** | **$5.95 billion** |

***Accounting for Near-Retiree Savings***

| Impact Type | 2020 | 2035 | Cumulative |
|---|---|---|---|
| Direct Output ($M) | $218 | $363 | $4.55 billion |
| Indirect & Induced Output ($M) | $213 | $361 | $4.51 billion |
| **Total Impact** | **$431 million** | **$724 million** | **$9.06 billion** |
| **Employment (FTE)** | **3,570 jobs** | **6,130 jobs** | **76,160 job-years** |
| **Employee Compensation** | **$141 million** | **$241 million** | **$3.00 billion** |

*Source: ESI modeling using IMPLAN*

## 3.4. Tax Revenue Impacts

The income differentials and associated differentials in household spending and economic activity described in Section 3.3 also have significant implications for tax revenue collection for the state and other jurisdictions. Impacts for a variety of revenue streams are estimated for the state and federal government, while impacts on sales tax revenue collections are estimated for municipal and county governments.

### State Revenue Impacts

Differentials in income, household spending, and economic activity have multiple effects on the state's tax base. The additional income available to elderly households under the sufficient savings scenario translates directly to additional state revenue directly through the state's personal income tax. Incremental household expenditures enabled by this disposable income generate state revenue through the sales tax and liquid fuels tax applied to direct purchases. Finally, the downstream activity in the Colorado economy attributable to incremental spending generates additional state personal income tax, corporate income tax, and sales and use tax collections.

State revenue impacts are estimated through the development of a customized fiscal impact model that relies on the known relationships between various types of economic activity and state tax collections (i.e. effective tax rates) in Colorado. Direct personal income tax effects are modeled as a function of the observed effective rates for elderly households published by the Colorado Department of Revenue.[49] Notably, this calculation is unaffected by the adjustment made in this analysis for additional savings by near-retiree households, since income levels for both elderly and near-retiree households remain unchanged by this step.

Effective sales tax rates for household expenditures are estimated calculated based on collection data by sector from 2018 published by the Department of Revenue.[50] Modeled household expenditures are matched to the relevant sector to estimate the appropriate rate. Additionally, the 22 cents per gallon liquid fuels tax that accrues to the Cash Fund is modeled based on the estimated incremental expenditures on this good.

Downstream tax impacts are modeled based on broader statewide relationships between activity types and tax collections since spillover activity flows across all sectors of the state economy. These effective rates are applied to the modeled differential in activity between the income scenarios.[51]

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[49] Colorado Department of Revenue. "Income and Tax Data for Residents 65 and Older by Size of Federal AGI 2015 Individual Income Tax Returns.". This data is divided into income bands matching the bands utilized throughout this analysis The use of these observed effective rates by income band captures the differential treatment of certain types of income within Colorado's tax code.

[50] Colorado Department of Revenue. "State Sales Tax Return Data by Industry," 2018.

[51] These effective rates are developed by comparing statewide earnings (as reported in Department of Revenue data) to statewide personal income tax collections; and statewide GDP (as estimated by the federal Bureau of Economic Analysis) to sales and corporate income tax collections. These effective rates are then applied to the incremental level of earnings or value

Inclusive of all of these components, state tax revenue from the income differential and incremental economic activity associated with spending by elderly households is estimated to total $44 million in 2020. This figure grows to $76 million in 2035, and totals $946 million over the fifteen year period from 2021-2035.

Accounting for the increased savings of near-retiree households, net state tax revenue is estimated to total $35 million in 2020. This figure grows to $60 million in 2035, and totals $742 million over the fifteen year period from 2021-2035 (see Figure 3.17).

Figure 3.17: State Revenue Impacts from Retirement Savings ($2020)

***Elderly Households Only***

| Tax Type | 2020 | 2035 | Cumulative |
|---|---|---|---|
| Personal Income Tax ($M) | $35.6 | $62.3 | $770 million |
| Sales and Use Tax ($M) | $7.2 | $12.2 | $152 million |
| Corporate Income Tax ($M) | $0.9 | $1.5 | $19 million |
| Motor Fuels Tax ($M) | $0.2 | $0.3 | $4 million |
| **Total State Tax ($M)** | **$44 million** | **$76 million** | **$946 million** |

***Accounting for Near-Retiree Savings***

| Tax Type | 2020 | 2035 | Cumulative |
|---|---|---|---|
| Personal Income Tax ($M) | $31.3 | $54.7 | $676 million |
| Sales and Use Tax ($M) | $2.7 | $4.3 | $54 million |
| Corporate Income Tax ($M) | $0.4 | $0.7 | $8 million |
| Motor Fuels Tax ($M) | $0.1 | $0.2 | $3 million |
| **Total State Tax ($M)** | **$35 million** | **$60 million** | **$742 million** |

*Source: ESI modeling using IMPLAN, BEA and Colorado Department of Revenue Data*

add (a measure of contribution to the state's gross product) as estimated by economic modeling through IMPLAN in the scenarios documented in Section 3.3.

## Local and Federal Impacts

State revenue impacts from household spending and spillover impacts are supplemented with revenue estimates from this activity for federal and local governments from similar tax types, where these estimates can be reliably generated.

### Local Revenue Impacts

Among the state tax types described above, significant local revenues are also derived by Colorado's municipalities and county governments through the sales tax. Since the sales tax is also applied at the state level, the relationship between incremental state and local sales tax can be utilized to estimate the incremental local sales tax from additional economic activity.

Data available through the Colorado Department of Revenue provides information on the taxable base of sales taking place within each jurisdiction.[52] This information is matched with the relevant tax rates to estimate local sales tax collections. Through this approach, it is estimated that each dollar of additional state sales tax corresponds with $0.85 in municipal sales tax collections and $0.55 in county sales tax collections, or $1.40 in total per dollar collections.[53]

Figure 3.18 presents estimates of municipal and county sales tax collections. Local sales tax revenue from the incremental economic activity associated with spending by elderly households is estimated to total $9.8 million in 2020. This figure grows to $16.7 million in 2035, and totals $209 million over the fifteen year period from 2021-2035.

Accounting for the increased savings of near-retiree households, net local sales tax revenue is estimated to total $3.6 million in 2020. This figure grows to $5.9 million in 2035, and totals $75 million over the fifteen year period from 2021-2035.

[52] Colorado Department of Revenue. "State Sales Tax Return Data by County and City."

[53] This analysis does not address local sales tax exemptions, which exclude certain areas of activity within some counties or municipalities from taxation. These exemptions are targeted in nature and are not expected to have a material impact on the aggregate calculation. In addition, the analysis does not include locally generated sales tax from jurisdiction types other than municipalities and counties, such as regional transportation districts, nor does it include use taxes.

Figure 3.18: Local Revenue Impacts from Retirement Savings ($2020)

***Elderly Households Only***

| Tax Type | 2020 | 2035 | Cumulative |
|---|---|---|---|
| Municipal Sales Tax ($M) | $6.0 | $10.1 | $126 million |
| County Sales Tax ($M) | $3.9 | $6.6 | $82 million |
| **Total Local Tax ($M)** | **$9.8 million** | **$16.7 million** | **$209 million** |

***Accounting for Near-Retiree Savings***

| Tax Type | 2020 | 2035 | Cumulative |
|---|---|---|---|
| Municipal Sales Tax ($M) | $2.2 | $3.6 | $45 million |
| County Sales Tax ($M) | $1.4 | $2.3 | $29 million |
| **Total Local Tax ($M)** | **$3.6 million** | **$5.9 million** | **$75 million** |

*Source: ESI Modeling using IMPLAN and Colorado Revenue Department Data*

Property taxes represent the primary funding mechanism for local governments across Colorado. As described in Section 2.1 of this analysis, the relationship between retirement savings levels and property taxes is not well defined, and no impacts on property values (and therefore property tax revenues) between the income scenarios is included in this analysis. Notably, however, the interaction between state and local revenues under TABOR means that state revenues levels are potentially relevant to the revenue levels of local governments.

## Federal Revenue Impacts

The economic activity from incremental household spending also generates significant revenue for the federal government. Analysis embedded in the IMPLAN modeling framework project federal tax revenues across a variety of tax bases, most notably employee compensation (which is subject to Social Security tax) and households through the income taxes.

Federal tax revenue, from the incremental economic activity associated with spending by elderly households, is estimated to total $90 million in 2020. This figure grows to $159 million in 2035, and totals $1.96 billion over the fifteen year period from 2021-2035.

Accounting for the increased savings of near-retiree households, net local federal tax revenue is estimated to total $39 million in 2020. This figure grows to $66 million in 2035, and totals $824 million over the fifteen year period from 2021-2035 (see Figure 3.19).

Figure 3.19: Federal Revenue Impacts from Retirement Savings ($2020)

***Elderly Households Only***

| Tax Type | 2020 | 2035 | Cumulative |
|---|---|---|---|
| Employee Compensation ($M) | $37.5 | $66.4 | $818 million |
| Proprietor Income ($M) | $2.6 | $4.6 | $57 million |
| Tax on Production and Imports ($M) | $4.1 | $7.0 | $87 million |
| Households ($M) | $33.8 | $59.9 | $738 million |
| Corporations ($M) | $12.4 | $21.0 | $262 million |
| **Total Federal Tax ($M)** | **$90 million** | **$159 million** | **$1.96 billion** |

***Accounting for Near-Retiree Savings***

| Tax Type | 2020 | 2035 | Cumulative |
|---|---|---|---|
| Employee Compensation ($M) | $16.2 | $27.6 | $343 million |
| Proprietor Income ($M) | $1.1 | $1.9 | $24 million |
| Tax on Production and Imports ($M) | $1.8 | $2.9 | $37 million |
| Households ($M) | $14.6 | $24.9 | $310 million |
| Corporations ($M) | $5.4 | $8.7 | $110 million |
| **Total Federal Tax ($M)** | **$39 million** | **$66 million** | **$824 million** |

*Source: ESI Modeling using IMPLAN*

# 4. Summary of Impacts

The impact of the savings levels of elderly Coloradans on state expenditures outlined in Section 2 and on revenues to the state outlined in Section 3 both bear on the fiscal position of the state and federal governments. The net fiscal impact of insufficient retiree savings is composed of both the increased expenditures on assistance programs and foregone tax revenues that are associated with insufficient savings and associated lower income and expenditure levels of elderly Coloradans.

This summary section aggregates the previously outlined net revenue and expenditure impacts to capture the total impact to the state. The total federal fiscal impact is also estimated for relevant federally funded programs and federal tax revenues.

## 4.1. Aggregate State and Federal Impacts

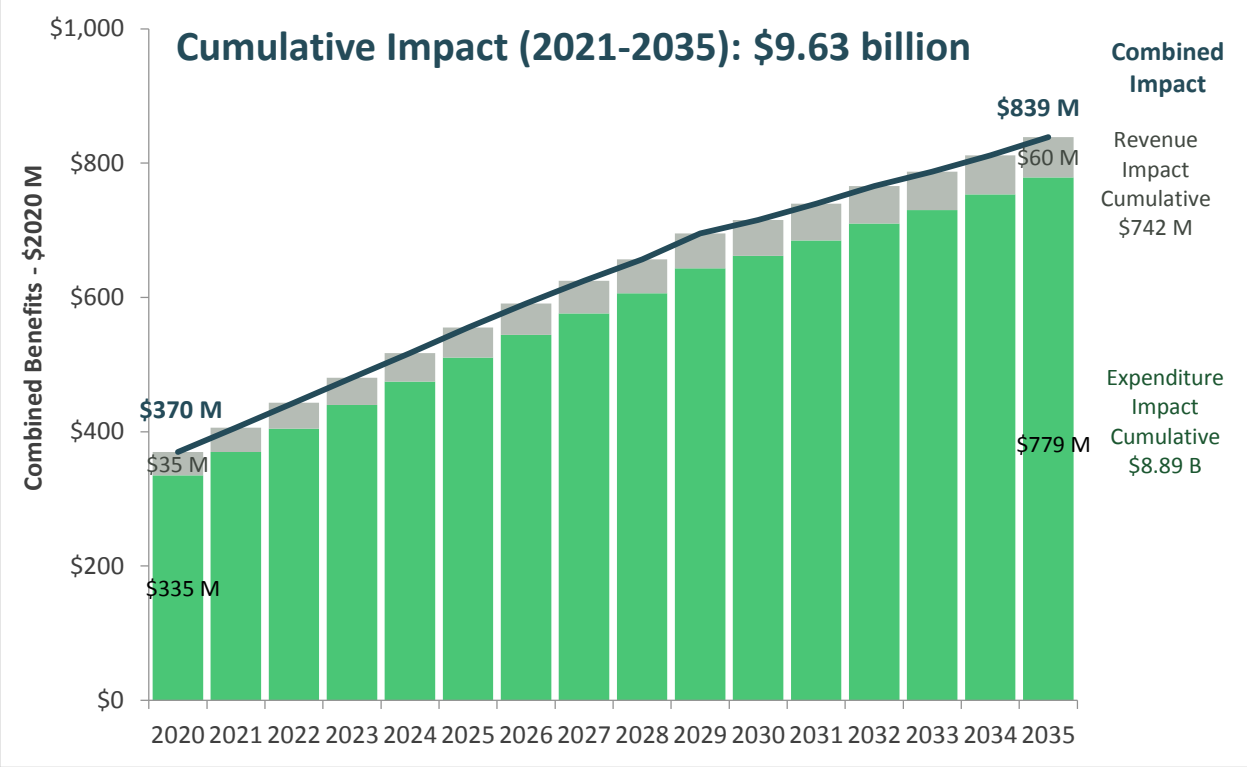
In Section 2, state expenditures on elderly residents through key senior-serving programs are identified and the additional cost to the state of insufficient retiree savings is quantified. This additional cost to the state attributable to insufficient savings is represented by the net differential in state costs between the "baseline" and "sufficient savings" income scenarios, when holding constant the level of services or benefits provided to each household at a given income level. This additional cost to the state is demonstrated in Figure 4.1 as the expenditure component of the aggregate fiscal impact to the state.

The revenue component of the fiscal impact to the state is detailed in Section 3. This tax revenue impact arises from the decreased income level and economic activity of elderly Coloradans associated with insufficient retirement savings. The differentials in income and in economic activity in turn impact tax revenue collections for the state. The revenue impact component of total impact, also depicted in Figure 4.1, represents the foregone revenue to the state under the baseline scenario relative to the sufficient savings scenario.

Figure 4.1 depicts total combined fiscal impact to the state over the analysis period. It is estimated that in 2020, insufficient retiree savings levels are associated with a total fiscal impact to the state of $370 million. The majority of this impact ($335 million) is associated with program expenditures. This combined fiscal impact is anticipated to increase to $839 million by 2035, of which $779 million is associated with program expenditures.

**The cumulative fiscal impact to the state from insufficient retiree savings is estimated at $9.63 billion over the fifteen year period from 2021-2035** (see Figure 4.1).

Figure 4.1: State Fiscal Impacts from Insufficient Savings, 2020-2035 ($2020)




## Federal Impacts

While this analysis focused primarily on impacts at the state level, federal program expenditures and federal tax revenue implications are also estimated. The additional federal spending on the identified assistance programs and the foregone federal tax revenues associated with insufficient savings are aggregated to quantify the combined federal fiscal impact.

It is estimated that in 2020, insufficient retirement savings levels of Coloradans are associated with a total federal fiscal impact of $338 million, $299 million of which is the result of increased program assistance costs. This combined federal fiscal impact rises to $784 million by 2035, of which $718 million is attributable to program cost impacts. The cumulative fiscal impact to the federal government due to insufficient retirement savings levels of elderly Coloradans is estimated at nearly $9 billion over the fifteen year period from 2021-2035 (see Figure 4.2).

Figure 4.2: Federal Fiscal Impacts from Insufficient Savings, 2020-2035 ($2020)

| Federal Impact Type | 2020 | 2035 | Cumulative |
|---|---|---|---|
| Program Expenditure Impact | 299 million | $718 million | $8.12 billion |
| Revenue Impact | $39 million | $66 million | $824 million |
| **Total State Tax ($M)** | **$338 million** | **$784 million** | **$8.95 billion** |

## 4.2. County Impacts

While this analysis focuses primarily on fiscal impacts from state and federal programs and on economic impacts within the state economy, demographic projections and more granular income data also allow for estimates of the current and future levels of retirement insufficiency by county.

Population forecasts from the Colorado State Demography Office provide household projections by age group for each of Colorado's 64 counties. These county by county totals sum to the statewide totals of 548,000 elderly (65+) households in 2020 and 816,000 in 2035 utilized throughout this analysis.

Income scenarios in this analysis are developed from statewide data drawn from the Current Population Survey (CPS), which represents the most comprehensive data source on incomes. County level income data by age cohort is available from the American Community Survey, while historical data is available from the decennial Census. This distributional information is used to allocate statewide income projections for elderly households under the baseline and sufficient scenarios to the county level.

County level data from Census 2000 on the incomes of working age households (45-64) are compared to 2018 5-Year ACS income data for elderly households (65+) to understand changes in income patterns as this population cohort entered retirement age in each county.[54] This information is used to estimate the "sufficiency gap" between baseline and sufficient incomes in each county, relative to the projected statewide gap of $4,810 for 2020.[55] This income translation is then extended forward by utilizing the 2018 5-Year ACS data on the incomes of current working age households (45-64) to project the income distribution and sufficiency gap for elderly (65+) households in 2035.

Finally, the "sufficiency gap" for elderly households under $75,000 in income in both 2020 and 2035 is translated into the level of annual savings that would be required to close this differential between baseline and sufficient incomes. Following the standard investment assumptions documented in Section 3.1, this analysis assumes a flat annual savings level of 30 years, an investment return of 6.5 percent annually, and an annual drawdown on savings of 4.5%.

Figures 4.3 and 4.4 present the projected elderly population, income and sufficiency metrics by county for 2020 and 2035. Notably, counties with above average elderly resident incomes may still have an above average savings gap, since sufficient incomes are defined in terms of the replacement rate of working age income.

[54] This step includes analysis of both the share of households with incomes under $75,000, and the distribution of incomes below that threshold, as reflected in the weighted average income.

[55] While reported incomes for elderly households in the ACS do reconcile precisely to the statewide elderly incomes derived from analysis of CPS data, the modeling approach uses the statewide distributions as a benchmark, and the ACS data as an input to model local variation. This approach ensures that county level estimates reconcile with the statewide analysis. County level income results should be understood as best estimates consistent with the statewide distribution, rather than directly yielded by a single data source.

Figure 4.3: Projected Retirement Savings Insufficiency by County, 2020

| County | Projected Elderly HH 2020 | Elderly HH with Income <$75,000 | Share of Elderly HH <$75,000 | Among Elderly HH w/Income <$75,000 Average Income | Average Sufficiency Gap | Annual Savings Required (30 Year) |
|---|---|---|---|---|---|---|
| Adams | 34,070 | 21,388 | 64% | $39,500 | $4,630 | $1,120 |
| Alamosa | 1,680 | 1,150 | 76% | $34,970 | $4,640 | $1,120 |
| Arapahoe | 57,893 | 32,161 | 54% | $39,750 | $5,130 | $1,240 |
| Archuleta | 2,438 | 1,621 | 67% | $41,410 | $3,380 | $820 |
| Baca | 588 | 436 | 85% | $32,260 | $4,110 | $990 |
| Bent | 624 | 477 | 87% | $33,600 | $4,030 | $970 |
| Boulder | 32,054 | 16,398 | 49% | $39,040 | $5,100 | $1,230 |
| Broomfield | 6,124 | 3,663 | 58% | $41,740 | $5,260 | $1,270 |
| Chaffee | 3,421 | 2,147 | 65% | $37,600 | $3,870 | $940 |
| Cheyenne | 264 | 182 | 77% | $35,530 | $4,450 | $1,070 |
| Clear Creek | 1,394 | 755 | 54% | $37,750 | $4,550 | $1,100 |
| Conejos | 1,093 | 749 | 78% | $30,990 | $4,210 | $1,020 |
| Costilla | 715 | 541 | 84% | $32,230 | $2,840 | $690 |
| Crowley | 444 | 317 | 82% | $32,680 | $4,110 | $990 |
| Custer | 1,089 | 811 | 76% | $46,630 | $3,460 | $840 |
| Delta | 5,272 | 3,649 | 74% | $35,970 | $4,090 | $990 |
| Denver | 62,141 | 37,592 | 62% | $35,500 | $4,360 | $1,050 |
| Dolores | 322 | 249 | 87% | $34,910 | $4,620 | $1,120 |
| Douglas | 24,921 | 12,049 | 44% | $43,160 | $6,930 | $1,670 |
| Eagle | 4,026 | 1,891 | 43% | $41,270 | $4,760 | $1,150 |
| El Paso | 61,839 | 36,525 | 59% | $38,770 | $4,580 | $1,110 |
| Elbert | 2,761 | 1,501 | 51% | $43,960 | $4,740 | $1,140 |
| Fremont | 6,637 | 4,609 | 74% | $36,430 | $4,310 | $1,040 |
| Garfield | 5,231 | 2,770 | 52% | $36,250 | $4,480 | $1,080 |
| Gilpin | 739 | 459 | 59% | $49,940 | $3,540 | $850 |
| Grand | 1,849 | 911 | 49% | $39,210 | $3,690 | $890 |
| Gunnison | 1,565 | 908 | 57% | $40,610 | $3,690 | $890 |
| Hinsdale | 137 | 93 | 65% | $38,630 | $3,520 | $850 |
| Huerfano | 1,383 | 1,024 | 82% | $32,490 | $3,920 | $950 |
| Jackson | 212 | 125 | 62% | $29,770 | $4,190 | $1,010 |
| Jefferson | 66,350 | 37,483 | 55% | $40,180 | $5,470 | $1,320 |
| Kiowa | 220 | 143 | 72% | $29,980 | $4,670 | $1,130 |
| Kit Carson | 946 | 692 | 77% | $37,850 | $4,220 | $1,020 |
| La Plata | 7,054 | 4,170 | 58% | $40,090 | $3,900 | $940 |

| County | Projected Elderly HH 2020 | Elderly HH with Income <$75,000 | Share of Elderly HH <$75,000 | Among Elderly HH w/Income <$75,000 Average Income | Average Sufficiency Gap | Annual Savings Required (30 Year) |
|---|---|---|---|---|---|---|
| Lake | 713 | 522 | 79% | $38,780 | $4,140 | $1,000 |
| Larimer | 36,974 | 21,879 | 59% | $39,040 | $5,020 | $1,210 |
| Las Animas | 2,316 | 1,643 | 76% | $37,600 | $3,420 | $830 |
| Lincoln | 664 | 450 | 70% | $36,010 | $4,120 | $990 |
| Logan | 2,505 | 1,738 | 74% | $34,660 | $4,250 | $1,030 |
| Mesa | 19,819 | 13,443 | 71% | $37,900 | $4,200 | $1,010 |
| Mineral | 179 | 103 | 53% | $48,470 | $1,970 | $470 |
| Moffat | 1,396 | 934 | 75% | $32,440 | $5,790 | $1,400 |
| Montezuma | 4,014 | 2,769 | 74% | $37,970 | $3,980 | $960 |
| Montrose | 6,523 | 4,387 | 72% | $34,250 | $4,310 | $1,040 |
| Morgan | 2,952 | 2,029 | 75% | $34,280 | $4,500 | $1,090 |
| Otero | 2,456 | 1,815 | 82% | $32,540 | $4,590 | $1,110 |
| Ouray | 851 | 536 | 61% | $44,970 | $3,200 | $770 |
| Park | 2,665 | 1,640 | 63% | $41,910 | $4,250 | $1,030 |
| Phillips | 603 | 392 | 64% | $35,120 | $3,380 | $820 |
| Pitkin | 2,320 | 1,125 | 44% | $47,550 | $3,390 | $820 |
| Prowers | 1,422 | 959 | 75% | $31,850 | $4,690 | $1,130 |
| Pueblo | 21,253 | 14,973 | 76% | $35,160 | $4,510 | $1,090 |
| Rio Blanco | 648 | 456 | 79% | $31,270 | $5,660 | $1,370 |
| Rio Grande | 1,494 | 990 | 72% | $35,130 | $4,180 | $1,010 |
| Routt | 2,578 | 1,332 | 50% | $38,460 | $4,760 | $1,150 |
| Saguache | 1,073 | 776 | 83% | $29,230 | $4,290 | $1,040 |
| San Juan | 126 | 76 | 58% | $33,800 | $2,660 | $640 |
| San Miguel | 847 | 451 | 49% | $37,850 | $4,160 | $1,010 |
| Sedgwick | 410 | 272 | 68% | $36,820 | $3,220 | $780 |
| Summit | 2,535 | 1,127 | 40% | $40,020 | $4,720 | $1,140 |
| Teller | 3,640 | 2,006 | 55% | $40,940 | $4,220 | $1,020 |
| Washington | 692 | 480 | 75% | $35,080 | $4,130 | $1,000 |
| Weld | 25,643 | 15,547 | 62% | $37,560 | $4,610 | $1,110 |
| Yuma | 1,206 | 856 | 79% | $33,480 | $4,930 | $1,190 |
| **Statewide** | **548,014** | **325,345** | **59%** | **$38,390** | **$4,810** | **$1,160** |

Figure 4.4: Projected Retirement Savings Insufficiency by County, 2035 (in $2020)

| | | | | Among Elderly HH w/Income <$75,000 ($2020) | | |
|---|---|---|---|---|---|---|
| County | Projected Elderly HH 2035 | Elderly HH with Income <$75,000 | Share of Elderly HH <$75,000 | Average Income | Average Sufficiency Gap | Annual Savings Required (30 Year) |
| Adams | 54,618 | 38,343 | 61% | $37,353 | $5,074 | $1,226 |
| Alamosa | 2,223 | 1,638 | 81% | $27,090 | $4,968 | $1,200 |
| Arapahoe | 87,608 | 50,024 | 53% | $37,440 | $5,206 | $1,258 |
| Archuleta | 3,604 | 1,656 | 74% | $31,058 | $5,041 | $1,218 |
| Baca | 543 | 485 | 79% | $28,371 | $4,913 | $1,187 |
| Bent | 577 | 512 | 82% | $26,519 | $4,877 | $1,178 |
| Boulder | 51,529 | 22,286 | 45% | $36,685 | $5,331 | $1,288 |
| Broomfield | 9,513 | 4,011 | 39% | $40,183 | $5,307 | $1,282 |
| Chaffee | 3,961 | 2,097 | 69% | $33,036 | $5,084 | $1,228 |
| Cheyenne | 289 | 249 | 73% | $38,092 | $4,907 | $1,185 |
| Clear Creek | 1,672 | 1,226 | 55% | $34,425 | $5,233 | $1,264 |
| Conejos | 1,195 | 1,093 | 87% | $27,315 | $4,844 | $1,170 |
| Costilla | 669 | 539 | 80% | $22,695 | $4,935 | $1,192 |
| Crowley | 427 | 384 | 84% | $30,551 | $4,896 | $1,183 |
| Custer | 1,109 | 586 | 76% | $24,453 | $4,952 | $1,196 |
| Delta | 6,761 | 3,638 | 77% | $30,256 | $4,965 | $1,199 |
| Denver | 96,608 | 57,330 | 62% | $32,161 | $5,196 | $1,255 |
| Dolores | 267 | 233 | 68% | $30,955 | $5,043 | $1,218 |
| Douglas | 49,459 | 16,027 | 30% | $42,241 | $5,368 | $1,297 |
| Eagle | 6,440 | 3,397 | 44% | $39,513 | $5,217 | $1,260 |
| El Paso | 88,970 | 54,437 | 56% | $35,575 | $5,162 | $1,247 |
| Elbert | 4,630 | 2,101 | 40% | $37,936 | $5,331 | $1,288 |
| Fremont | 6,682 | 4,589 | 72% | $32,076 | $4,998 | $1,207 |
| Garfield | 8,770 | 5,234 | 60% | $37,382 | $5,056 | $1,221 |
| Gilpin | 963 | 810 | 53% | $39,554 | $5,077 | $1,226 |
| Grand | 2,438 | 1,849 | 67% | $36,711 | $5,012 | $1,211 |
| Gunnison | 1,954 | 1,646 | 69% | $33,790 | $5,062 | $1,223 |
| Hinsdale | 108 | 123 | 70% | $30,182 | $5,037 | $1,217 |
| Huerfano | 1,237 | 962 | 79% | $32,847 | $4,876 | $1,178 |
| Jackson | 196 | 198 | 78% | $33,657 | $4,983 | $1,204 |
| Jefferson | 97,005 | 48,625 | 51% | $37,935 | $5,227 | $1,263 |
| Kiowa | 203 | 188 | 81% | $32,086 | $4,963 | $1,199 |
| Kit Carson | 1,048 | 846 | 74% | $35,629 | $4,928 | $1,190 |
| La Plata | 11,411 | 5,437 | 59% | $35,301 | $5,166 | $1,248 |

| County | Projected Elderly HH 2035 | Elderly HH with Income <$75,000 | Share of Elderly HH <$75,000 | Among Elderly HH w/Income <$75,000 ($2020) Average Income | Average Sufficiency Gap | Annual Savings Required (30 Year) |
|---|---|---|---|---|---|---|
| Lake | 751 | 963 | 77% | $28,636 | $5,112 | $1,235 |
| Larimer | 53,716 | 25,680 | 54% | $36,709 | $5,169 | $1,249 |
| Las Animas | 2,356 | 2,023 | 83% | $28,945 | $4,941 | $1,194 |
| Lincoln | 753 | 475 | 79% | $34,075 | $4,879 | $1,179 |
| Logan | 3,117 | 2,278 | 74% | $36,051 | $4,976 | $1,202 |
| Mesa | 28,891 | 16,218 | 71% | $34,109 | $4,991 | $1,206 |
| Mineral | 158 | 127 | 67% | $36,046 | $5,092 | $1,230 |
| Moffat | 1,553 | 1,382 | 65% | $37,159 | $5,035 | $1,216 |
| Montezuma | 4,946 | 3,456 | 78% | $32,370 | $4,889 | $1,181 |
| Montrose | 9,556 | 5,133 | 77% | $33,400 | $4,939 | $1,193 |
| Morgan | 3,959 | 3,018 | 73% | $34,638 | $4,984 | $1,204 |
| Otero | 2,453 | 2,368 | 84% | $28,357 | $4,893 | $1,182 |
| Ouray | 771 | 601 | 69% | $32,326 | $5,040 | $1,217 |
| Park | 3,850 | 2,002 | 55% | $35,892 | $5,056 | $1,221 |
| Phillips | 620 | 526 | 74% | $30,830 | $5,035 | $1,216 |
| Pitkin | 2,516 | 1,832 | 57% | $37,446 | $5,327 | $1,287 |
| Prowers | 1,507 | 1,449 | 78% | $30,527 | $5,005 | $1,209 |
| Pueblo | 28,524 | 17,890 | 74% | $31,205 | $4,995 | $1,207 |
| Rio Blanco | 759 | 646 | 68% | $39,795 | $4,925 | $1,190 |
| Rio Grande | 1,512 | 1,560 | 84% | $26,271 | $4,888 | $1,181 |
| Routt | 3,227 | 2,573 | 58% | $37,480 | $5,140 | $1,242 |
| Saguache | 1,084 | 1,105 | 83% | $26,600 | $4,999 | $1,208 |
| San Juan | 103 | 65 | 67% | $28,795 | $5,163 | $1,247 |
| San Miguel | 1,297 | 962 | 62% | $34,871 | $5,085 | $1,228 |
| Sedgwick | 386 | 317 | 87% | $30,885 | $4,788 | $1,157 |
| Summit | 2,928 | 2,322 | 55% | $38,142 | $5,111 | $1,235 |
| Teller | 4,598 | 3,361 | 66% | $35,331 | $5,054 | $1,221 |
| Washington | 806 | 469 | 69% | $32,353 | $5,015 | $1,212 |
| Weld | 43,322 | 22,989 | 58% | $37,932 | $5,077 | $1,227 |
| Yuma | 1,294 | 1,186 | 79% | $39,275 | $4,871 | $1,177 |
| **Statewide** | **815,999** | **457,775** | **56%** | **$35,709** | **$5,163** | **$1,247** |

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