



 Health Care Cost Trends

# Fifty States, Fifty Stories: A Decade of Health Care Reform Under the Affordable Care Act – Technical Report





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# Fifty States, Fifty Stories: A Decade of Health Care Reform Under the Affordable Care Act— Technical Report

## Introduction

The Patient Protection and Affordable Care Act (ACA) was enacted in March 2010, 10 years ago as of the writing of this report. The law fundamentally changed the health care system in the United States and has had a profound impact on many stakeholders. In our report “Fifty States, Fifty Stories: A Decade of Health Care Reform Under the Affordable Care Act,” we performed a fact-based assessment of the outcomes under the ACA using a time series of state-level data collected from public sources.

This report provides a summary of the state market data over time. It is intended to support actuaries and other professionals in their ongoing work and research to understand the history of the individual and Medicaid markets since the inception of the ACA and to develop their own estimates of future outcomes as the markets continue to evolve. These results are technical in nature and assume the user is familiar with the structure of the ACA and state insurance markets. Users are advised to consult with an actuary or other qualified professional when using or interpreting these data.

## Data Dictionary

Enclosed with this report is an Excel file providing the time series of data collected for our research. The data is organized by state and year for each year from 2013–2020. Data metrics were collected for the following broad areas:

- **Market characteristics.** State policy decisions as they relate to the individual and Medicaid markets.
- **Population metrics.** Uninsured population metrics and enrollment metrics for the individual and Medicaid markets.
- **Demographic information.** Details on the demographic and metal level distribution of enrollees in the individual market exchanges.
- **Insurer participation.** Insurer participation in the individual market exchanges and Medicaid managed care programs.
- **Premium information.** Includes statewide average premium rate, advanced premium tax credit (APTC), premium rate net of APTC, age rating factor, actuarial value and plan liability risk score. Also includes statewide average premium rates for the benchmark silver and lowest-cost premium bronze, silver and gold plans offered on the exchange in rural and urban areas.
- **Risk adjustment information.** The sum of the absolute value of risk adjustment transfers statewide, as well as the statewide average age rating factor, actuarial value and plan liability risk score (as reported in the Centers for Medicare and Medicaid Services (CMS) risk adjustment reports).
- **Insurer financials.** Statewide average preliminary medical loss ratio (MLR) and underwriting gain/loss margin for all insurers in aggregate and for the subset of insurers offering ACA-compliant business.

- **Other information.** Weights of “direct” enrollment from the American Community Survey (ACS) census data. These weights may be useful in aggregating various metrics within or across states. Note, these values will not tie to individual market insurer enrollment data.

Certain metrics were either unavailable or not collected for a subset of years between 2013 and 2020; entries for those metrics will be null. Other metrics that were collected were only available for certain states (for example, a metric may only be available for states that use the federal exchange platform); entries for metrics that are included for some states but not others will be listed as “NA” where they were unavailable.

Table 1 provides a data dictionary containing a list of data field names, a description of the data contained in the field and additional information necessary to interpret the data, as needed. As described more fully in the Data and Methods section of this report, many of these metrics had to be estimated using a number of assumptions.

**Table 1**  
DATA DICTIONARY

Field Name	Description	Comments
State	State Abbreviation	
Year	Calendar Year	2013–2020
<b>Market Characteristics</b>		
Market_Ind_Exchange	Individual marketplace platform	FP - federally facilitated exchange on federal platform SBE-FPs - state-based exchange on federal platform SBE - state-based exchange on state platform
Market_Ind_Transitional	Indicator for whether transitional plans were allowed in that year	0 - transitional plans not allowed 1 - transitional plans allowed
Market_Ind_AgeCurve	Prescribed age rating curve	Fed_14 - federal age curve for 2014–2017 Fed_18 - federal age curve for 2018+ DC - state-specific age curve in Washington, DC MA - state-specific age in Massachusetts MN - state-specific age curve in Minnesota UT - state-specific age curve in Utah Community - no rate variation by age allowed
Market_Ind_MergedMarket	Indicator for merged individual and small-group markets	0 - not merged 1 - merged
Market_Ind_StandardizedPlan	State approach to having standardized plan design on the exchange	0 - no standardized plans 1 - all exchange plans are standardized 2 - Insurers must offer certain standardized plan(s) but are permitted to offer nonstandardized plans as well.
Market_Ind_1332Waiver	Indicator for an active (approved and implemented) Section 1332 State Innovation Waiver	0 - no 1332 waiver 1 - state-based reinsurance program in effect 2 - waiver for ACA Small Business Health Options Program (SHOP) requirements
Market_Ind_PreACA_AllowedUW	Indicator of pre-ACA (prior to 2014) market rules regarding rating for health status	0 - did not allow rating for health status 1 - allowed rating for health status
Market_Ind_PreACA_NoAgeRating	Indicator for whether pre-ACA (prior to 2014) rates were allowed to vary by age	0 - rate variation by age allowed 1 - no rate variation by age allowed

Field Name	Description	Comments
Market_MCaid_Expansion	Indicator for whether the state’s Medicaid program was expanded under the ACA.	0 - not expanded 1 - expanded
Market_MCaid_BHP	Indicator for whether the state has an active (adopted and implemented) Basic Health Program (BHP).	Y - yes N - no
Market_MCaid_RiskBased_MCP	Indicator if the state operates a risk based Medicaid managed care program (MCP).	0 - MCP not present 1 - MCP present
<b>Population Metrics</b>		
Pop_NumUninsured_Cit	Total number of uninsured citizens under age 65.	
Pop_NumUninsured_NonCit	Total number of uninsured noncitizens under age 65.	
Pop_UninsuredPerc	Percent of the total under-age-65 population that is uninsured.	
Pop_Enroll_ACA_On	Total enrollment in an ACA-compliant plans purchased through the exchange.	
Pop_Enroll_ACA_Off	Total enrollment in ACA-compliant individual market plans purchased outside of the exchange.	
Pop_Enroll_NonACA	Total enrollment in non-ACA-compliant individual market plans (grandfathered or transitional).	
Pop_MCaid_Total_Mem_NonExpan	Total Medicaid membership for the nonexpansion population.	
Pop_MCaid_Total_Mem_Expan	Total Medicaid membership for the expansion population.	
Pop_MCaid_MCO_Mem_NonExpan	Total Medicaid enrollment for the nonexpansion population enrolled with a Medicaid managed care organization (MCO).	
Pop_MCaid_MCO_Mem_Expan	Total Medicaid enrollment for the expansion population enrolled with a Medicaid MCO.	
Pop_Ind_MarketShare	Percentage of individual market membership enrolled with the insurer with the largest market share in the state. Membership included in this calculation includes ACA-compliant and non-ACA-compliant membership for insurers offering ACA-compliant business in the state.	

Field Name	Description	Comments
<b>Demographic Information</b>		
Demo_ACA_On_Metal_Platinum	Percentage of exchange selections in platinum plans.	<p>NA - Data not available NR - Data not reported due to low enrollment</p> <p><i>Note: Distributions by metal, age and FPL may not sum to 100% for one or more of the following reasons:</i></p> <ol style="list-style-type: none"> <li>1) The source data for 2014 and 2016 (Assistant Secretary for Planning and Evaluation, ASPE, marketplace summary enrollment data) was rounded to the nearest percent.</li> <li>2) The source data for 2015 (CMS ACA Enrollment Public Use Files) was reported at the county level, and enrollment was too low to report in certain cells.</li> <li>3) State-based exchange states have had issues validating enrollment in certain years, where the reported enrollment by cell (metal, age or FPL) does not equal total reported enrollment statewide.</li> </ol>
Demo_ACA_On_Metal_Gold	Percentage of exchange selections in gold plans.	
Demo_ACA_On_Metal_Silver	Percentage of exchange selections in silver plans.	
Demo_ACA_On_Metal_Bronze	Percentage of exchange selections in bronze plans.	
Demo_ACA_On_Metal_Cat	Percentage of exchange selections in catastrophic plans.	
Demo_ACA_On_Age_Under18	Percentage of exchange selections under age 18.	
Demo_ACA_On_Age_1825	Percentage of exchange selections age 18 to 25.	
Demo_ACA_On_Age_2634	Percentage of exchange selections age 26 to 34.	
Demo_ACA_On_Age_3544	Percentage of exchange selections age 35 to 44.	
Demo_ACA_On_Age_4554	Percentage of exchange selections age 45 to 54.	
Demo_ACA_On_Age_5564	Percentage of exchange selections age 55 to 64.	
Demo_ACA_On_Age_Over65	Percentage of exchange selections age 65 and older.	
Demo_ACA_On_FPL_NotRequest	Percentage of exchange selections that did not request financial assistance.	
Demo_ACA_On_FPL_100150	Percentage of exchange selections with income $\geq 100\%$ and $\leq 150\%$ Federal Poverty Level (FPL).	
Demo_ACA_On_FPL_150200	Percentage of exchange selections with income $> 150\%$ and $\leq 200\%$ FPL.	
Demo_ACA_On_FPL_200250	Percentage of exchange selections with income $> 200\%$ and $\leq 250\%$ FPL.	
Demo_ACA_On_FPL_250300	Percentage of exchange selections with income $> 250\%$ and $\leq 300\%$ FPL.	
Demo_ACA_On_FPL_300400	Percentage of exchange selections with income $> 300\%$ and $\leq 400\%$ FPL.	
Demo_ACA_On_FPL_Other	Percentage of exchange selections with income $< 100\%$ or $> 400\%$ FPL.	
<b>Insurer Participation</b>		
Partic_ACA_On_Insurers	Count of insurers offering ACA-compliant plans on the exchanges; insurers were counted using unique parent companies, derived from the HIX Compare database sponsored by the Robert Wood Johnson Foundation (insurance companies are identified as "carrier" in the database).	
Partic_ACA_On_Insurers_Entrant	Count of insurers offering plans on an ACA state exchange that did not offer plans on that exchange in the prior year; see Partic_ACA_On_Insurers for a description of how insurers were counted.	
Partic_ACA_On_Insurers_Exits	Count of insurers no longer offering plans on an ACA state exchange that offered plans on that exchange in the prior year;	

Field Name	Description	Comments
	see Partic_ACA_On_insurers for a description of how insurers were derived.	
Partic_MCAid_Insurers	Count of Medicaid MCOs contracted with the state to provide benefits to Medicaid beneficiaries.	
Partic_MCAid_Insurers_Entrant	Count of Medicaid MCOs contracted with the state to provide benefits to Medicaid beneficiaries that were not contracted to provide benefits in that state the prior year.	
Partic_MCAid_Insurers_Exits	Count of Medicaid MCOs no longer contracted with the state to provide benefits to Medicaid beneficiaries that were contracted to provide benefits in that state the prior year.	
Partic_ACA_On_Perc_One_Insurer	Percent of the direct and uninsured populations (from the ACS data) that only have one insurer option available in their county of residence on the state's exchange.	
<b>Premium Information</b>		
Prem_ind_all_SWPrem	Individual market average statewide premium rate per member per month (PMPM), including ACA-compliant and non-ACA-compliant business.	
Prem_ind_ACA_SWPrem	Individual market ACA-compliant average statewide premium rate PMPM (excludes catastrophic plans).	NA - Data not available in Massachusetts from 2014–2016; the risk adjustment program was operated by the state in those years.
Prem_ind_ACA_APTC	Individual market ACA-compliant statewide average monthly APTC for individuals who received an APTC.	NA - Data not available
Prem_ind_ACA_SWPrem_wAPTC	Individual market ACA-compliant statewide average premium rate PMPM after the application of APTCs for individuals who received an APTC.	NA - Data not available
Prem_Ind_ACA_On_SW_U_Min_B	Individual market ACA-compliant average monthly premium rate for a person age 40 for the lowest-cost bronze plan offered on the exchange in urban areas.	
Prem_Ind_ACA_On_SW_U_Min_S	Individual market ACA-compliant average monthly premium rate for a person age 40 for the lowest-cost silver plan offered on the exchange in urban areas.	
Prem_Ind_ACA_On_SW_U_Min_G	Individual market ACA-compliant average monthly premium rate for a person age 40 for the lowest-cost gold plan offered on the exchange in urban areas.	
Prem_Ind_ACA_On_SW_R_Min_B	Individual market ACA-compliant average monthly premium rate for a person age 40 for the lowest-cost bronze plan offered on the exchange in rural areas.	
Prem_Ind_ACA_On_SW_R_Min_S	Individual market ACA-compliant average monthly premium rate for a person age 40 for the lowest-cost silver plan offered on the exchange in rural areas.	



Field Name	Description	Comments
Prem_Ind_ACA_On_SW_R_Min_G	Individual market ACA-compliant average monthly premium rate for a person age 40 for the lowest-cost gold plan offered on the exchange in rural areas.	
Prem_Ind_ACA_On_SW_U_Min_B_APTC	Individual market ACA-compliant average monthly premium rate for a person age 40 for the lowest-cost bronze plan offered on the exchange in urban areas, after the application of APTCs.	APTCs calculated for a single individual at 250% FPL.
Prem_Ind_ACA_On_SW_U_Min_S_APTC	Individual market ACA-compliant average monthly premium rate for a person age 40 for the lowest-cost silver plan offered on the exchange in urban areas, after the application of APTCs.	APTCs calculated for a single individual at 250% FPL.
Prem_Ind_ACA_On_SW_U_Min_G_APTC	Individual market ACA-compliant average monthly premium rate for a person age 40 for the lowest-cost gold plan offered on the exchange in urban areas, after the application of APTCs.	APTCs calculated for a single individual at 250% FPL.
Prem_Ind_ACA_On_SW_R_Min_B_APTC	Individual market ACA-compliant average monthly premium rate for a person age 40 for the lowest-cost bronze plan offered on the exchange in rural areas, after the application of APTCs.	APTCs calculated for a single individual at 250% FPL.
Prem_Ind_ACA_On_SW_R_Min_S_APTC	Individual market ACA-compliant average monthly premium rate for a person age 40 for the lowest-cost silver plan offered on the exchange in rural areas, after the application of APTCs.	APTCs calculated for a single individual at 250% FPL.
Prem_Ind_ACA_On_SW_R_Min_G_APTC	Individual market ACA-compliant average monthly premium rate for a person age 40 for the lowest-cost gold plan offered on the exchange in rural areas, after the application of APTCs.	APTCs calculated for a single individual at 250% FPL.
Prem_Ind_ACA_On_SW_U_2nd_S	Individual market ACA-compliant average monthly premium rate for a person age 40 for the second-lowest cost silver plan offered on the exchange in urban areas.	
Prem_Ind_ACA_On_SW_R_2nd_S	Individual market ACA-compliant average monthly premium rate for a person age 40 for the second-lowest cost silver plan offered on the exchange in rural areas.	

Field Name	Description	Comments
<b>Risk Adjustment Information</b>		
RiskAdj_Abs_RiskAdj_Transfer	The sum of the absolute value of individual market risk adjustment transfers paid and received by insurers in the state. (See comments for states with a merged market.)  <i>Note: States with a merged individual and small-group market will reflect the risk adjustment transfer for the entire merged market.</i>	NA - Data not available in Massachusetts from 2014–2016; the risk adjustment program was operated by the state in those years.
RiskAdj_ind_ACA_ARF	Statewide average age rating factor for individuals enrolled in an ACA-compliant individual market plan (excludes catastrophic plans).	
RiskAdj_ind_ACA_AV	Statewide average actuarial value for individuals enrolled in an ACA-compliant individual market plan (excludes catastrophic plans).	
RiskAdj_ind_ACA_PLRS	Statewide average plan liability risk score for individuals enrolled in an ACA-compliant individual market plan (excludes catastrophic plans).	
<b>Insurer Financials</b>		
Financial_MLR_All	Average individual market preliminary CMS medical loss ratio (MLR) for all insurers offering individual market business in the state.	
Financial_MLR_ACA_Only	Average individual market preliminary CMS MLR for insurers that offer ACA-compliant business in the state. Note that the non-ACA-compliant business for these insurers is still reflected in their MLR.	
Financial_UW_GainLoss_All	Average individual market underwriting gain/loss margin for all insurers offering individual market business in the state.	
Financial_UW_GainLoss_ACA_Only	Average individual market underwriting gain/loss margin for insurers that offer ACA-compliant business in the state. Note that the non-ACA-compliant business for these insurers is still reflected in their underwriting gain loss margin.	
<b>Other Information</b>		
weight_direct_U	Direct enrollment in urban areas from the ACS data.	2019 and 2020 direct enrollment set equal to 2018.
weight_direct_R	Direct enrollment in rural areas from the ACS data.	

## Data and Methods

### DATA SOURCES

The data provided in this report was generally compiled from publicly available sources. Table 2 includes a list of the information and data sources used.

**Table 2**

#### DATA SOURCES

Data	Link <sup>1</sup>
CMS ACA Enrollment Public Use Files (PUF)	<a href="https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/Marketplace-Products">https://www.cms.gov/Research-Statistics-Data-and-Systems/Statistics-Trends-and-Reports/Marketplace-Products</a> (retrieved Sept. 26, 2019)
CMS Medical Loss Ratio PUF	<a href="https://www.cms.gov/CCIIO/Resources/Data-Resources/mlr">https://www.cms.gov/CCIIO/Resources/Data-Resources/mlr</a> (retrieved Dec. 16, 2019)
CMS Effectuated Enrollment Summaries	<a href="https://www.cms.gov/newsroom/fact-sheets/early-2019-effectuated-enrollment-snapshot">https://www.cms.gov/newsroom/fact-sheets/early-2019-effectuated-enrollment-snapshot</a> (retrieved Aug.13, 2019)
CMS Risk Adjustment Reports	<a href="https://www.cms.gov/CCIIO/Programs-and-Initiatives/Premium-Stabilization-Programs">https://www.cms.gov/CCIIO/Programs-and-Initiatives/Premium-Stabilization-Programs</a> (retrieved Jan. 8, 2020)
Office of the ASPE marketplace summary enrollment reports and data for 2014 and 2015	<a href="https://aspe.hhs.gov/report/health-insurance-marketplace-2015-open-enrollment-period-january-enrollment-report">https://aspe.hhs.gov/report/health-insurance-marketplace-2015-open-enrollment-period-january-enrollment-report</a> (retrieved Sept. 4, 2019)  <a href="https://aspe.hhs.gov/profiles-affordable-care-act-coverage-expansion-enrollment-medicare-chip-and-health-insurance-marketplace-10-1-2013-3-31-2014">https://aspe.hhs.gov/profiles-affordable-care-act-coverage-expansion-enrollment-medicare-chip-and-health-insurance-marketplace-10-1-2013-3-31-2014</a> (retrieved Oct. 8, 2019)
HIX Compare database sponsored by the Robert Wood Johnson Foundation, providing plan design and premium rate data for 2014 (states on the federal exchange platform only) and 2015–2020 (all states)	<a href="https://hixcompare.org/">https://hixcompare.org/</a> (retrieved Nov. 5, 2019)
Healthcare.gov premium database for states participating on federal marketplace.	<a href="https://www.healthcare.gov/health-and-dental-plan-datasets-for-researchers-and-issuers/">https://www.healthcare.gov/health-and-dental-plan-datasets-for-researchers-and-issuers/</a> (retrieved Aug. 12, 2019, and Jan. 27, 2020)
Milliman internal database of plan design and premium rates for 2014 state-based exchanges.	N/A
Medicaid enrollment, budget and expenditure data provided on Medicaid.gov	<a href="https://www.medicaid.gov/index.html">https://www.medicaid.gov/index.html</a> (retrieved Oct. 10, 2019)
Medical Expenditure Panel Survey through the Agency for Healthcare Research and Quality	<a href="https://www.ahrq.gov/data/meps.html">https://www.ahrq.gov/data/meps.html</a> (retrieved Nov. 1, 2019)
US Census Bureau’s American Community Survey data	<a href="https://www.census.gov/programs-surveys/acs">https://www.census.gov/programs-surveys/acs</a> (retrieved Nov. 14, 2019)
NAIC annual financial statements	<a href="https://www.naic.org/insdata_home.htm">https://www.naic.org/insdata_home.htm</a> (retrieved Nov. 1, 2019)

<sup>1</sup> Retrieval dates listed. Links may become outdated.

## METHODS AND ASSUMPTIONS

Many of the metrics included in the dataset are reported directly from their source. Certain other metrics were estimated using a combination of data sources and assumptions. For example, premium metrics were collected at the county or ACA rating region level and aggregated to the state level, and certain population metrics were imputed from multiple data sources. Estimates included in the dataset are described in detail below.

### PREMIUM RATE CALCULATION

- Premiums for 2013 are based on insurer MLR filings.
- Premiums by ACA rating region in each year from 2014–2020 were obtained from the HIX Compare database sponsored by the Robert Wood Johnson Foundation (except for state-based exchange states in 2014).
- Premiums by ACA rating region for state-based exchange states in 2014 were obtained from Milliman’s internal database of plan design and premium rates for 2014 state-based exchanges.
- Statewide average premiums were calculated by weighting together premiums by county using “direct” enrollment by county from the ACS census data. When a county spanned multiple ACA rating areas, the enrollment within that county was assumed to be distributed evenly across those areas. Enrollment for 2019 and 2020 is not yet available and was assumed to follow 2018.
- Advanced Premium Tax Credits were estimated using the second-lowest silver plan for an individual with income equivalent to 250% federal poverty level.

### INSURER PARTICIPATION AND SERVICE AREAS

- Insurer participation is calculated by counting unique parent companies in each state, derived from the HIX Compare database sponsored by the Robert Wood Johnson Foundation (insurance companies are identified as “carrier” in the database). Insurers are counted once for each state exchange they participate in (for example, if an insurer participates in three state exchanges and has plans under two legal entities in each state, the count for that insurer would be three).
- Service area information is publicly available from healthcare.gov at the plan and county level for states on the federally facilitated exchange platform.
- Service area information is publicly available from the HIX Compare database at the county and issuer ID level (but not the plan level) for state-based exchange states. Therefore, an insurer’s entire service area is assumed to apply to all plans the insurer offers within each ACA rating region. To the extent that insurers offer plans in a subset of counties within an ACA rating region, the percentage of the population with only one insurer option may be higher than reported in the data.
- Certain metrics are provided for the subset of insurers offering ACA-compliant business in the state. We identified insurers offering ACA-compliant business by matching Issuer IDs from insurer MLR filings to the Issuer IDs reported in the CMS risk adjustment reports.

### POPULATION ESTIMATES

- Uninsured counts were retrieved from the ACS census data. The 2019 uninsured count was estimated based on 2018 uninsured rate from ACS data and U.S. total population reported by www.census.gov as of July 1, 2019.
- The distribution of individual market enrollment by ACA rating region was estimated from county-level ACS census data for the direct population. When a county spanned multiple ACA rating areas, the enrollment within that county was assumed to be distributed evenly across those areas. Enrollment for 2019 and 2020 is not yet available and was assumed to follow 2018.

- On-exchange enrollment was obtained from the individual market effectuated enrollment reports released by CMS.
- Off-exchange enrollment was estimated based on differences between individual market billable risk adjustment member months reported in risk adjustment reports and exchange enrollment reported in CMS effectuated enrollment reports.
- Medicaid enrollment was retrieved from CMS eligibility reports and includes all beneficiaries receiving comprehensive coverage (including dual and non-dual eligibles). 2019 Medicaid enrollment reflects CMS-reported eligibility for September 2019.

#### UNDERWRITING GAIN/LOSS MARGIN

- Underwriting gain/loss margin was calculated from insurer MLR filings using the underwriting gain/loss margin formula prescribed in the NAIC Supplemental Health Care Exhibits.

#### PERCENTAGE OF POPULATION WITH ONLY ONE INSURER OPTION AVAILABLE

- The percentage of population with only one insurer option was estimated based on plan offerings at the ACA rating area level and the population identified as “direct” or “uninsured” from the ACS census data by county. When a county spanned multiple ACA rating areas, the population within that county was assumed to be distributed evenly across those areas. Enrollment for 2019 and 2020 is not yet available and was assumed to follow 2018. As noted in under “Insurer Participation and Service Areas” above, the percentage of the population with only one insurer option may be higher in state-based exchange states to the extent that insurers offer plans in a subset of counties within an ACA rating area.

### Other Considerations

Milliman, Inc. (Milliman) was retained by the Society of Actuaries (SOA) to conduct fact-based, data-driven research on measurable outcomes in the individual and Medicaid markets 10 years following the inception of the Patient Protection and Affordable Care Act.

We relied on publicly available data and other information for this analysis. We have performed a limited review of the data and other information and checked for reasonableness and consistency; we have not found material defects in the data or information used. If there are material defects in the data or other information, it is possible that they would be uncovered by a detailed, systematic review and comparison of the data to search for data values that are questionable or for relationships that are materially inconsistent. Such a review was beyond the scope of this assignment.

Differences between estimates in this analysis and actual amounts depend on the extent to which estimated outcomes conform to the assumptions made for this analysis. It is certain that actual amounts will not conform exactly to the assumptions used in this analysis. Actual amounts will differ from estimated outcomes to the extent the assumptions in this analysis are not realized. This analysis of historical data and outcomes may differ materially from future outcomes.

Guidelines issued by the American Academy of Actuaries require actuaries to include their professional qualifications in actuarial communications. Paul Houchens, Lindsay Kotecki and Hans Leida are members of the American Academy of Actuaries and meet its qualification standards to perform the analysis and render any actuarial opinions contained herein.

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## About the Society of Actuaries

The Society of Actuaries (SOA), formed in 1949, is one of the largest actuarial professional organizations in the world dedicated to serving more than 31,000 actuarial members and the public in the United States, Canada and worldwide. In line with the SOA Vision Statement, actuaries act as business leaders who develop and use mathematical models to measure and manage risk in support of financial security for individuals, organizations and the public.

The SOA supports actuaries and advances knowledge through research and education. As part of its work, the SOA seeks to inform public policy development and public understanding through research. The SOA aspires to be a trusted source of objective, data-driven research and analysis with an actuarial perspective for its members, industry, policymakers and the public. This distinct perspective comes from the SOA as an association of actuaries, who have a rigorous formal education and direct experience as practitioners as they perform applied research. The SOA also welcomes the opportunity to partner with other organizations in our work where appropriate.

The SOA has a history of working with public policymakers and regulators in developing historical experience studies and projection techniques as well as individual reports on health care, retirement and other topics. The SOA's research is intended to aid the work of policymakers and regulators and follow certain core principles:

**Objectivity:** The SOA's research informs and provides analysis that can be relied upon by other individuals or organizations involved in public policy discussions. The SOA does not take advocacy positions or lobby specific policy proposals.

**Quality:** The SOA aspires to the highest ethical and quality standards in all of its research and analysis. Our research process is overseen by experienced actuaries and nonactuaries from a range of industry sectors and organizations. A rigorous peer-review process ensures the quality and integrity of our work.

**Relevance:** The SOA provides timely research on public policy issues. Our research advances actuarial knowledge while providing critical insights on key policy issues, and thereby provides value to stakeholders and decision makers.

**Quantification:** The SOA leverages the diverse skill sets of actuaries to provide research and findings that are driven by the best available data and methods. Actuaries use detailed modeling to analyze financial risk and provide distinct insight and quantification. Further, actuarial standards require transparency and the disclosure of the assumptions and analytic approach underlying the work.

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