

Contingent Annuity (CA) Analysis

Contingent Annuity Work Group (CAWG) of the
Life Products Committee of the
American Academy of Actuaries

January 19, 2012



Background

- The 10/28/11 CAWG report used a CAWG model to demonstrate that a typical CA design, similar to CA products in the marketplace today, includes a material life contingent component
- On 12/22/11 the NAIC Contingent Annuity Task Force asked the CAWG to utilize that model to compare the lifetime income generated by two different investment arrangements:
 - A typical CA design
 - Self-Insurance (i.e., no benefits and no fees)



Basis of Comparison

- The analysis compares:
 - The claims paid under a CA in order to continue a planned level of annual withdrawals from an asset fund once the fund is exhausted, to
 - The amount of funds needed to continue a planned level of annual withdrawals from an asset fund once the fund is exhausted under self-insurance (i.e., if there were no CA benefits and no CA fees)
- The amount of funds needed to continue a planned level of withdrawals from an asset fund once the fund is exhausted under self-insurance is referred to as a “shortfall”



Summary of Results

- The CA design analyzed provides benefits over self-insurance to some consumers, under both average and high longevity assumptions
- There is 21.1% CA claim frequency if the 65-year-old lives to life expectancy (19 years, or age 84), and a 10.8% shortfall frequency under self-insurance
- There is 48.5% CA claim frequency if the 65-year-old lives to 100 and a 22.3% shortfall frequency under self-insurance
- The average total lifetime income under this CA design is greater than that with self-insurance, although it should be noted that the average assets remaining in the underlying asset fund at death are less than under self-insurance due to the deduction of fees



Detailed Assumptions and Results



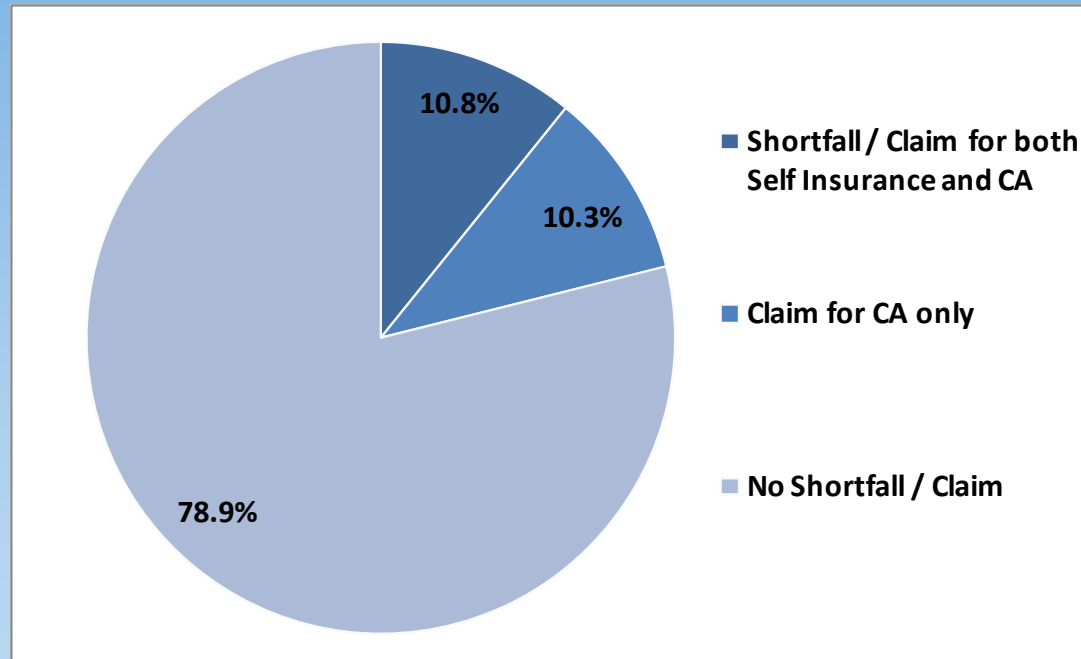
Typical CA Design vs. Self-Insurance Assuming Living to Life Expectancy

- \$100K initial account value
- Issued to 65-year-old male with immediate income (life expectancy - 19 years)
- 60% equity allocation/ 40% fixed (1000 scenarios)
- CA design modeled is typical in the marketplace
 - 1% CA fee based on Guaranteed Benefit Base (GBB)
 - CA annual income 5% of GBB
 - Value of GBB “ratchets up” yearly if the account value increases above the current GBB
- Self-insurance – annual income 5% of initial account value



Shortfall Scenario Count Assuming Living to Life Expectancy

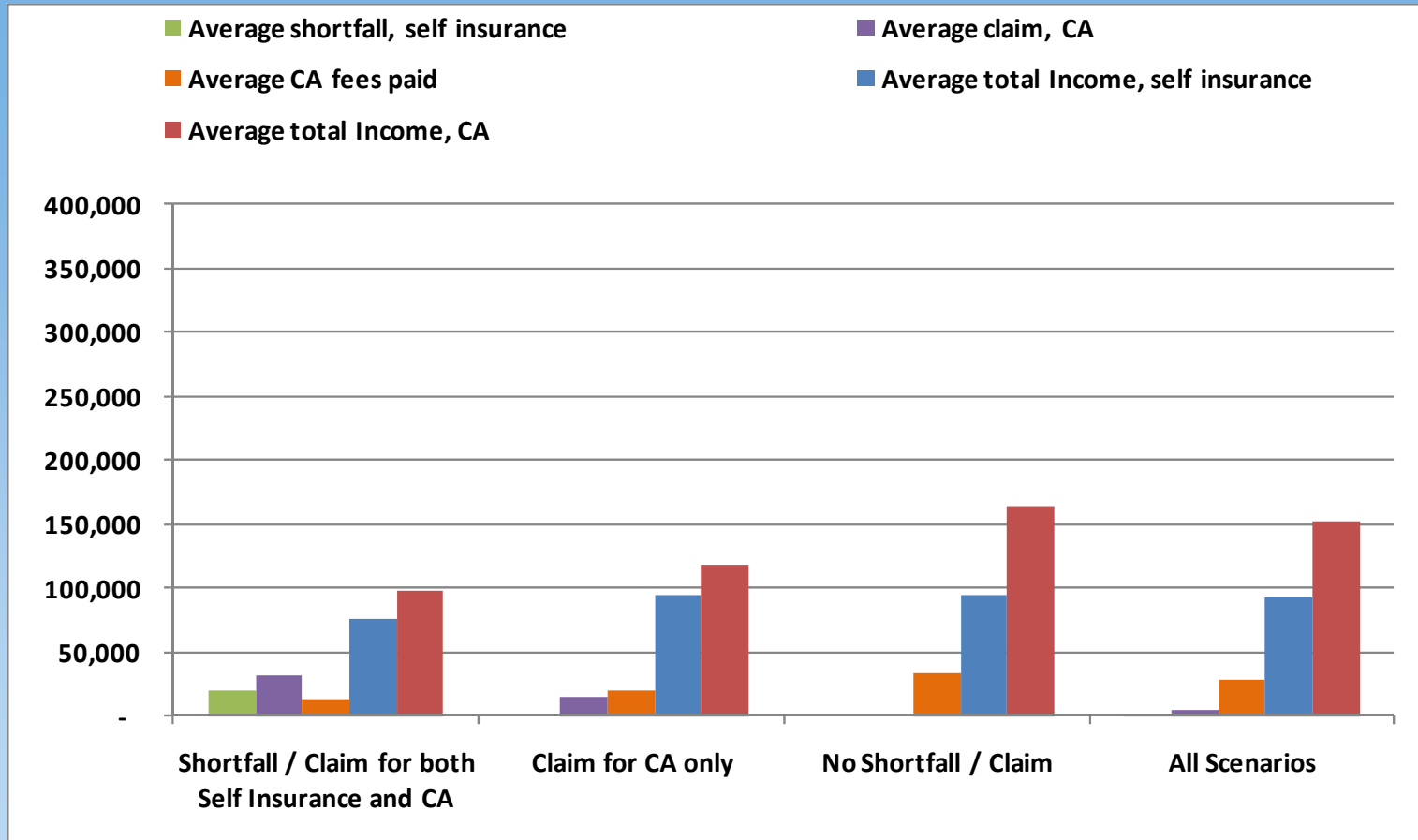
There is 21.1% CA claim frequency if the 65-year-old lives to life expectancy (19 years), and a 10.8% shortfall frequency under self-insurance



Source: CAWG



Shortfall, Claims, Fees & Total Income Assuming Living to Life Expectancy



Source: CAWG



Shortfall, Claims, Fees & Total Income Assuming Living to Life Expectancy

Backup Data to Graph on Page 8

	All Shortfall Scenarios	Shortfall / Claim for both Self Insurance and CA	Claim for CA only	No Shortfall / Claim	All Scenarios
# of scenarios	211	108	103	789	1,000
Frequency	21.1%	10.8%	10.3%	78.9%	100%
Average shortfall, self insurance	19,185*	19,185	-	-	2,072
Average claim, CA	23,901*	32,502	14,883	-	5,043
Average CA fees paid	16,051	12,366	19,914	32,753	29,229
Average total Income, self insurance	85,180	75,815	95,000	95,000	92,928
Average total Income, CA	107,553	97,261	118,344	163,820	151,947

Source: CAWG

* See slide 16 for a detailed distribution of shortfall/claim



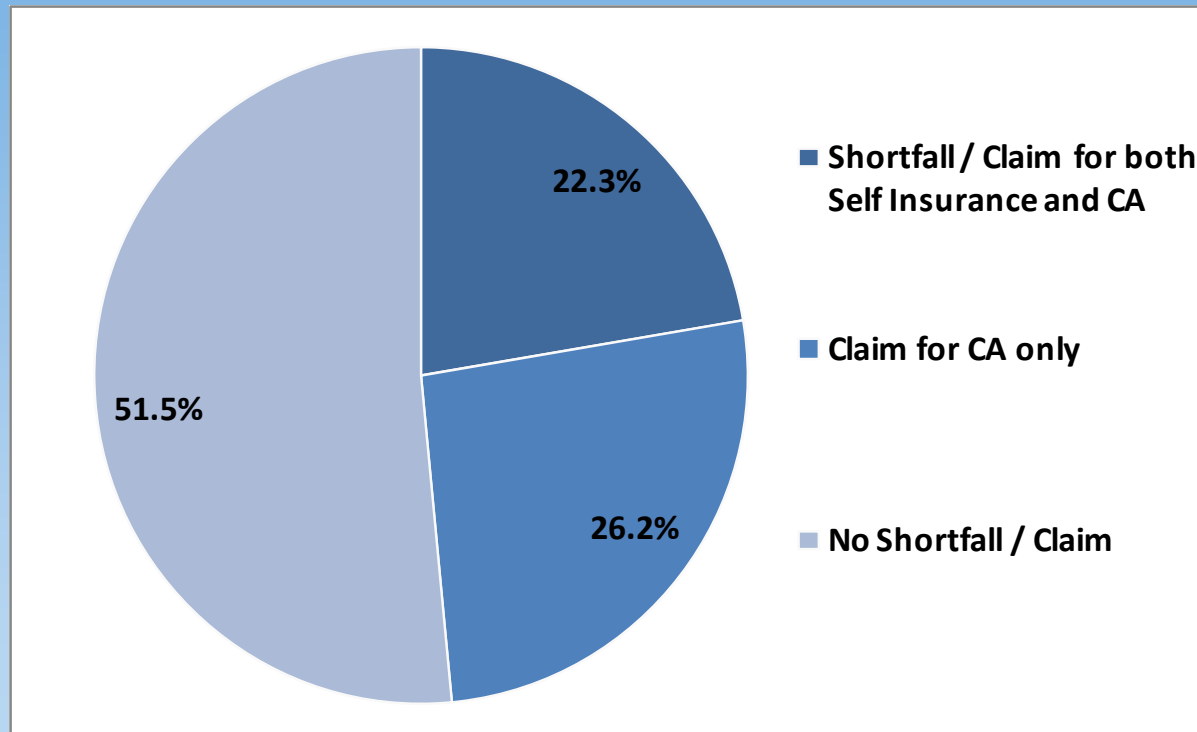
Typical CA Design vs. Self-Insurance Assuming Living to 100

- \$100K initial account value
- Issued to 65-year-old male with immediate income (assumed life expectancy - 35 years)
- 60% equity allocation/ 40% fixed (1000 scenarios)
- CA design modeled is typical in the marketplace
 - 1% CA fee based on Guaranteed Benefit Base (GBB)
 - CA annual income 5% of GBB
 - Value of GBB “ratchets up” yearly if the account value increases above the current GBB
- Self-insurance – annual income 5% of initial account value



Shortfall Scenario Count Assuming Living to 100

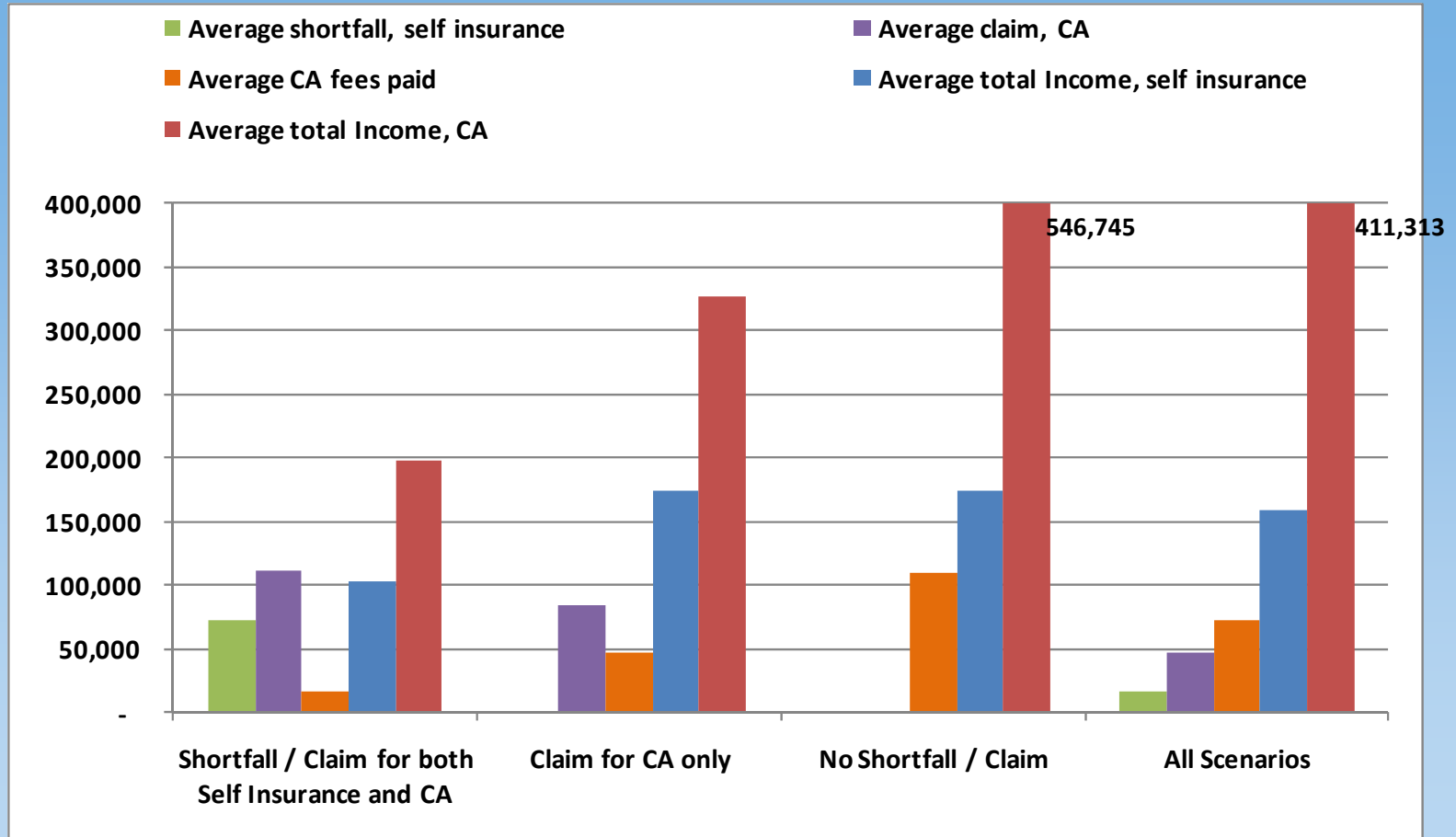
There is 48.5% CA claim frequency if the 65-year-old lives to 100 and a 22.3% shortfall frequency under self-insurance



Source: CAWG



Shortfall, Claims, Fees & Total Income Assuming Living to 100



Source: CAWG



Shortfall, Claims, Fees & Total Income Assuming Living to 100

Backup Data for Graph on Page 12

	All Shortfall Scenarios	Shortfall / Claim for both Self Insurance and CA	Claim for CA only	No Shortfall / Claim	All Scenarios
-					
# of scenarios	485	223	262	515	1,000
Frequency	48.5%	22.3%	26.2%	51.5%	100%
Average shortfall, self insurance	72,817*	72,817	-	-	16,238
Average claim, CA	97,138*	111,308	85,078	-	47,112
Average CA fees paid	33,089	16,682	47,054	109,349	72,363
Average total Income, self insurance	141,519	102,183	175,000	175,000	158,762
Average total Income, CA	267,505	198,166	326,522	546,745	411,313

Source: CAWG

* See slide 16 for a detailed distribution of shortfall/claim



Additional Observations

- **Results reflect specific designs and behavioral assumptions for both CA and self-insurance, e.g.:**
 - Asset mixes, and whether consumer choice on asset mix would vary between CA and self-insurance
 - Incorporation of advisory fees, and whether the same or different for self-insurance
 - Timing of withdrawals - deferral period before withdrawals begin or immediate
- **Changes to these assumptions could affect results in either direction**



Additional Information



Distribution of Shortfall / Claim

Live to life expectancy

Live to age 100

Distribution results	Contingent Annuity claim	Self Insurance Shortfall	Distribution results	Contingent Annuity claim	Self Insurance Shortfall
1%	\$ 252	\$ -	1%	\$ 6,211	\$ -
5%	\$ 2,839	\$ -	5%	\$ 20,371	\$ -
10%	\$ 6,377	\$ -	10%	\$ 43,692	\$ -
25%	\$ 14,741	\$ 108	25%	\$ 73,661	\$ 224
50%	\$ 23,434	\$ 11,870	50%	\$ 103,058	\$ 19,910
75%	\$ 32,935	\$ 20,402	75%	\$ 120,000	\$ 77,573
95%	\$ 44,427	\$ 37,421	95%	\$ 166,182	\$ 125,470
99%	\$ 50,190	\$ 46,035	99%	\$ 209,928	\$ 170,717
Max	\$ 51,198	\$ 46,981	Max	\$ 294,870	\$ 126,981
Average	\$ 23,901	\$ 19,185	Average	\$ 97,138	\$ 72,817
Standard Deviation	\$ 12,683	\$ 12,639	Standard Deviation	\$ 41,326	\$ 41,983

Source: CAWG

Source: CAWG

- It is important to consider not only averages, but also the distribution of results
- Tail measures (e.g., 95th, 99th percentiles) indicate the uncertainty that individuals would wish to protect themselves against with respect to outliving their assets
- Living longer has a significant impact on the magnitude of claim / shortfall in the tail, as shown above



Self Insurance vs. Contingent Annuity

Additional comparative view: No CA step-ups

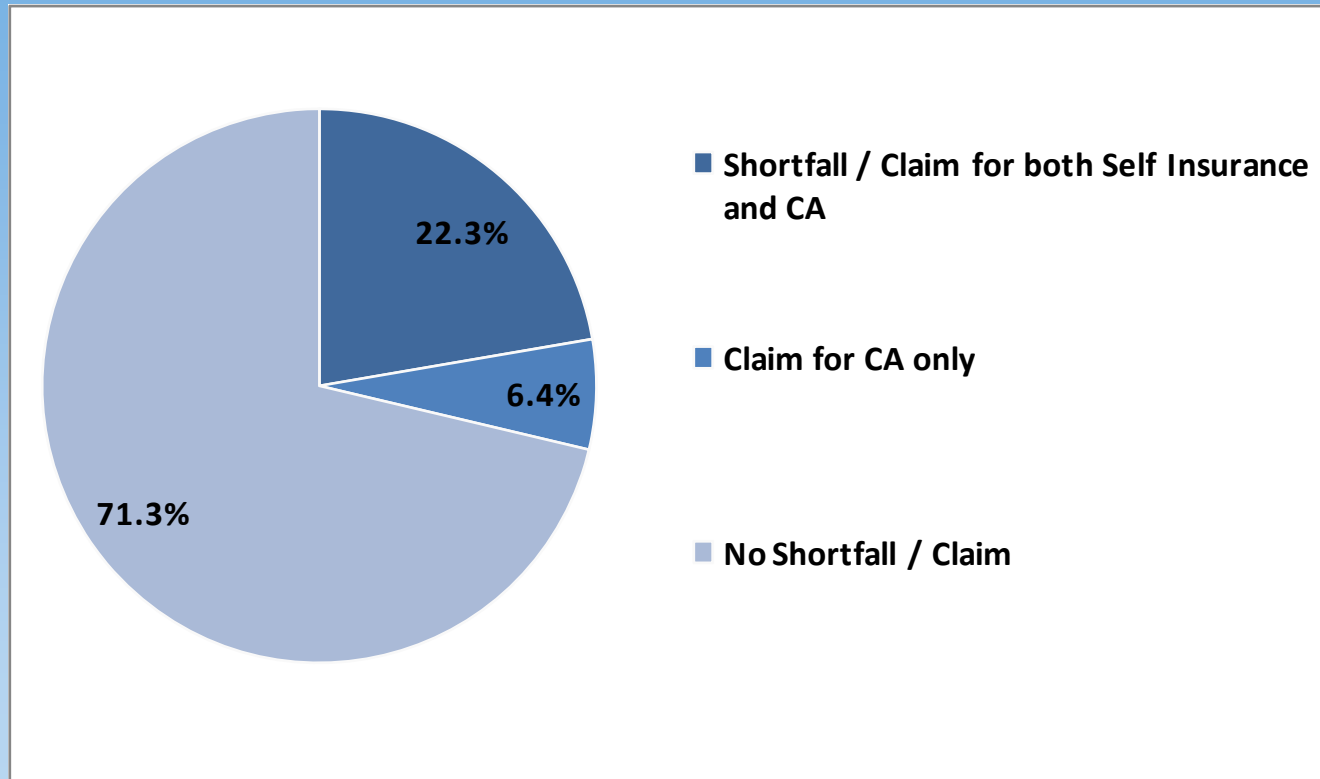
- **The analysis shown in the previous slides compares:**
 - A typical CA design, where income and fees are determined as a percentage of a ratcheting benefit base, to
 - A self insurance approach, where income is a flat percentage of initial account value
- **An alternative way to compare the CA to self insurance would be to assume all CA income and fees are on an initial account value basis rather than a ratcheting benefit base**
 - While this is not at all a typical CA design, it allows for more direct comparability of shortfall, claims, and income with self-insurance
- **The following slides compare a CA with self insurance, where both the CA fees and income are based on initial account value, with no step-ups**
 - Assumes a 65-year-old lives to age 100
 - Other assumptions consistent with other analysis shown in this presentation



Self Insurance vs. Contingent Annuity

No CA step-ups

There is 28.7% CA claim frequency if the 65-year-old lives to 100 and a 22.3% shortfall frequency under self-insurance.



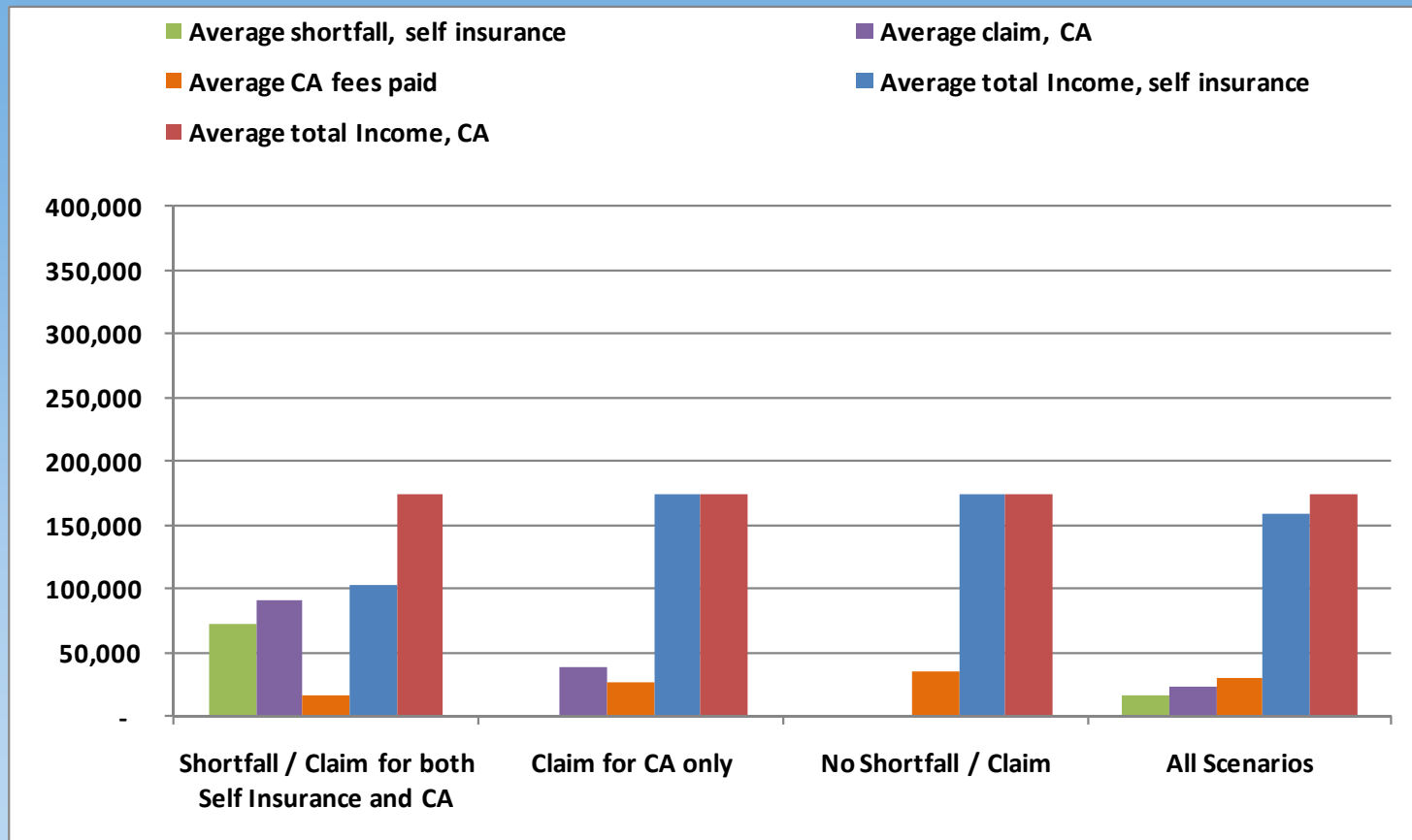
Source: CAWG



Self Insurance vs. Contingent Annuity

No CA step-ups

Assuming Living to Age 100



Source: CAWG



Self Insurance vs. Contingent Annuity

No CA step-ups

Backup Data for Graph on Page 19

	All Shortfall Scenarios	Shortfall / Claim for both Self Insurance and CA	Claim for CA only	No Shortfall / Claim	All Scenarios
# of scenarios	287	223	64	713	1,000
Frequency	28.7%	22.3%	6.4%	71.3%	100%
Average shortfall, self insurance	72,817	72,817	-	-	16,238
Average claim, CA	79,658	91,230	39,334	-	22,862
Average CA fees paid	18,495	16,193	26,516	35,000	30,263
Average total Income, self insurance	118,421	102,183	175,000	175,000	158,762
Average total Income, CA	175,000	175,000	175,000	175,000	175,000

Source: CAWG



Self Insurance vs. Contingent Annuity

No CA step-ups

Distribution results	CDA claim	Self Insurance Shortfall
1%	\$ 8,817	\$ -
5%	\$ 16,746	\$ -
10%	\$ 26,488	\$ 52
25%	\$ 55,813	\$ 224
50%	\$ 86,056	\$ 20,000
75%	\$ 107,258	\$ 76,627
95%	\$ 121,601	\$ 113,021
99%	\$ 127,593	\$ 123,933
Max	\$ 130,820	\$ 126,981
Average	\$ 79,658	\$ 72,817
Standard Deviation	\$ 32,729	\$ 40,882

Source: CAWG

