

Behavioral Drivers of Experience Results

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Background

How does **behavior** impact **mortality**?

1) Direct Effects (Moral Hazard):

Policyholder behavior causes direct change to their own individual mortality risk

- Suicide
- Lifestyle Factors
(obesity, narcotics, tobacco, alcohol, driving, hobbies, etc.)

2) Indirect Effects (Anti Selection):

Policyholder behavior causes change the relative risk of the insured pool

- Applicant/agent pre-issue adverse selection
- Anti-selective lapsation

Behavior and Mortality

Direct Effects

Moral Hazard

When the actions of market participants on one side are unfavorable to the other due to misaligned incentives.

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“At the next bailout, let's also ask for a pony.”

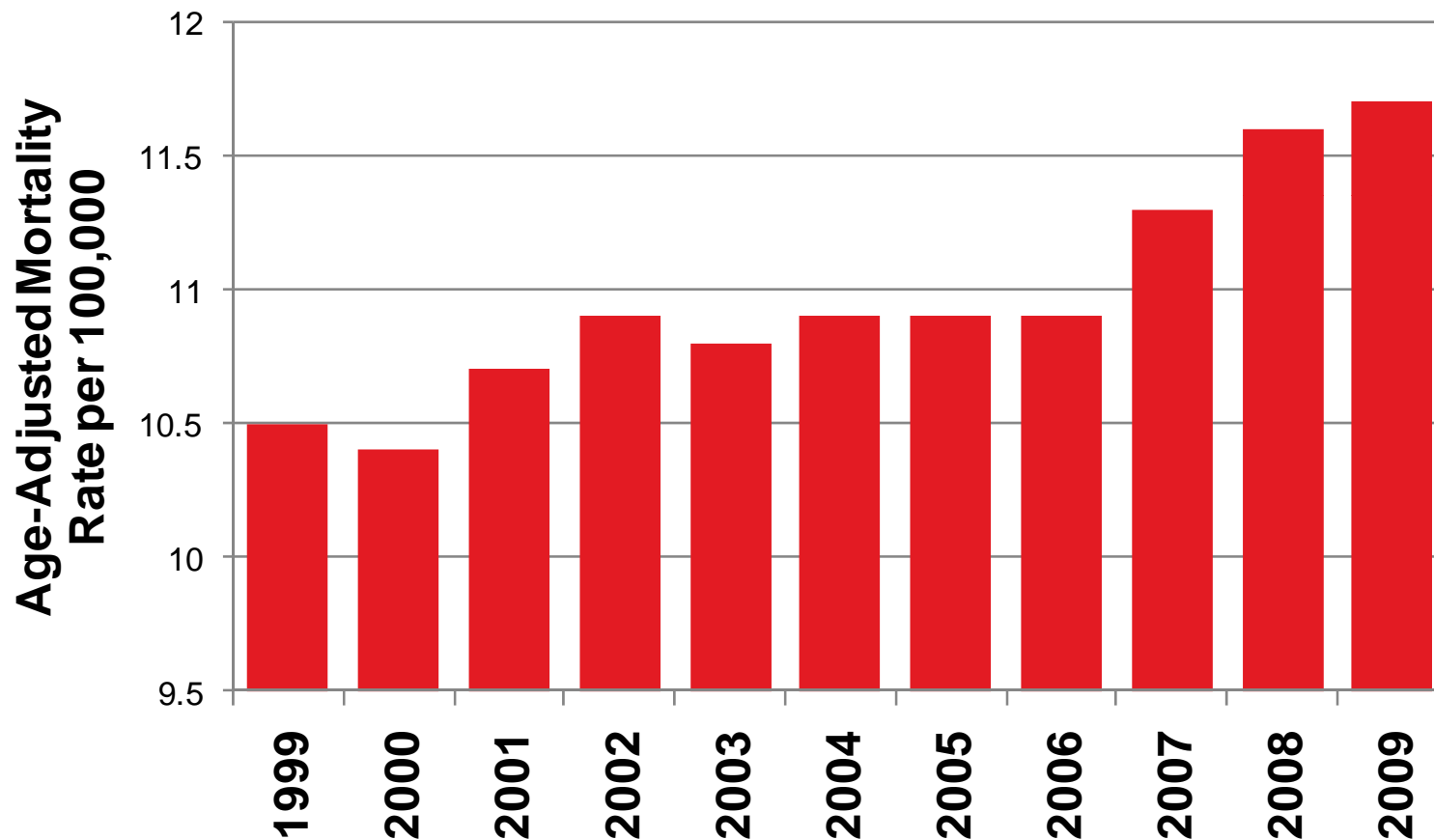
Moral Hazard and Mortality

- **Effective underwriting aims to identify and rate for **leading indicators** of mortality risk:**
 - Direct medical factors (BMI, personal & family history, etc.)
 - Lifestyle factors (avocations, tobacco use, drug/alcohol abuse, etc.)
 - Depression and other indicators of suicide risk
- **Post-issue, risk is of **changes** to risk profile.**
 - Mortality improvement trends could be impacted by lifestyle factors changing in prevalence compared to historical levels (esp. obesity and tobacco)
 - Moral Hazard risk could cause applicants to behave differently than they would if they weren't insured.

Recent US Suicide Trend

- Noticeable up-tick in suicides corresponding with Global Financial Crisis (consistent with RGA and anecdotal industry experience)

Intentional Self Harm (Suicide)



Suicides and Recessions

Recent research from U.S. Center for Disease Control confirms link between economic downturns and suicides:

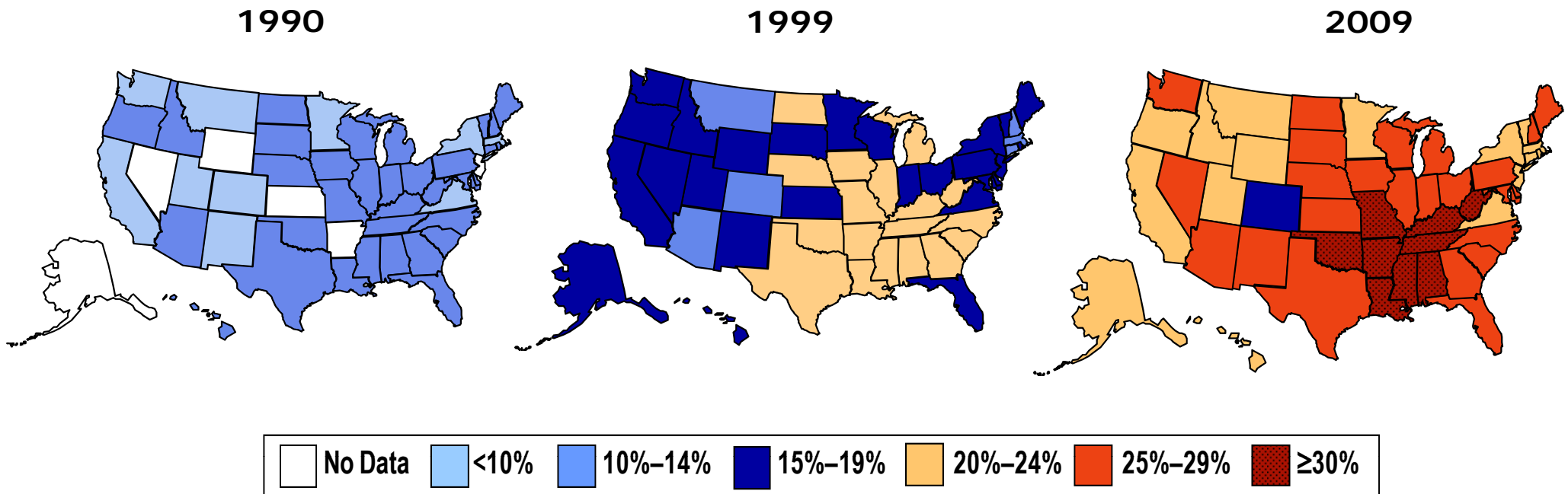
- “The overall **suicide rate generally rose in recessions** like the Great Depression (1929-1933), the end of the New Deal (1937-1938), the Oil Crisis (1973-1975), and the Double-Dip Recession (1980-1982) and **fell in expansions** like the WWII period (1939-1945) and the longest expansion period (1991-2001) in which the economy experienced fast growth and low unemployment.
- The largest increase in the overall suicide rate occurred in the Great Depression (1929-1933)—it surged from 18.0 in 1928 to 22.1 (all-time high) in 1932 (the last full year in the Great Depression)—a record increase of 22.8% in any four-year period in history. It fell to the lowest point in 2000.”

Overweight and Obesity

- Large volume of research shows link between mortality and BMI
- Increasing trend in obesity and overweight leads to uncertainty about mortality and mortality improvement rates in the future

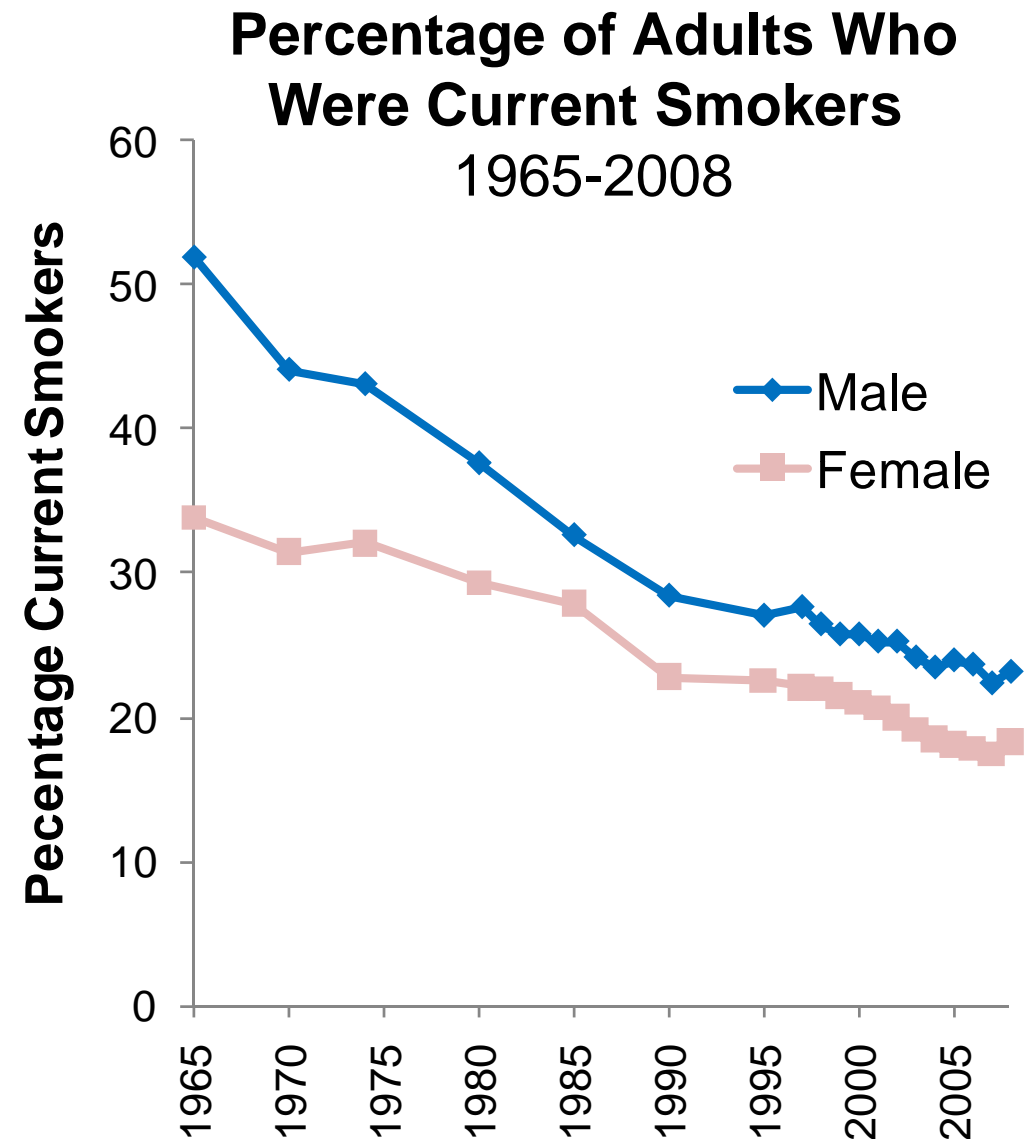
Obesity Trends* Among U.S. Adults BRFSS, 1990, 1999, 2009

(*BMI ≥ 30 , or about 30 lbs. overweight for 5'4" person)



Smoking Trends

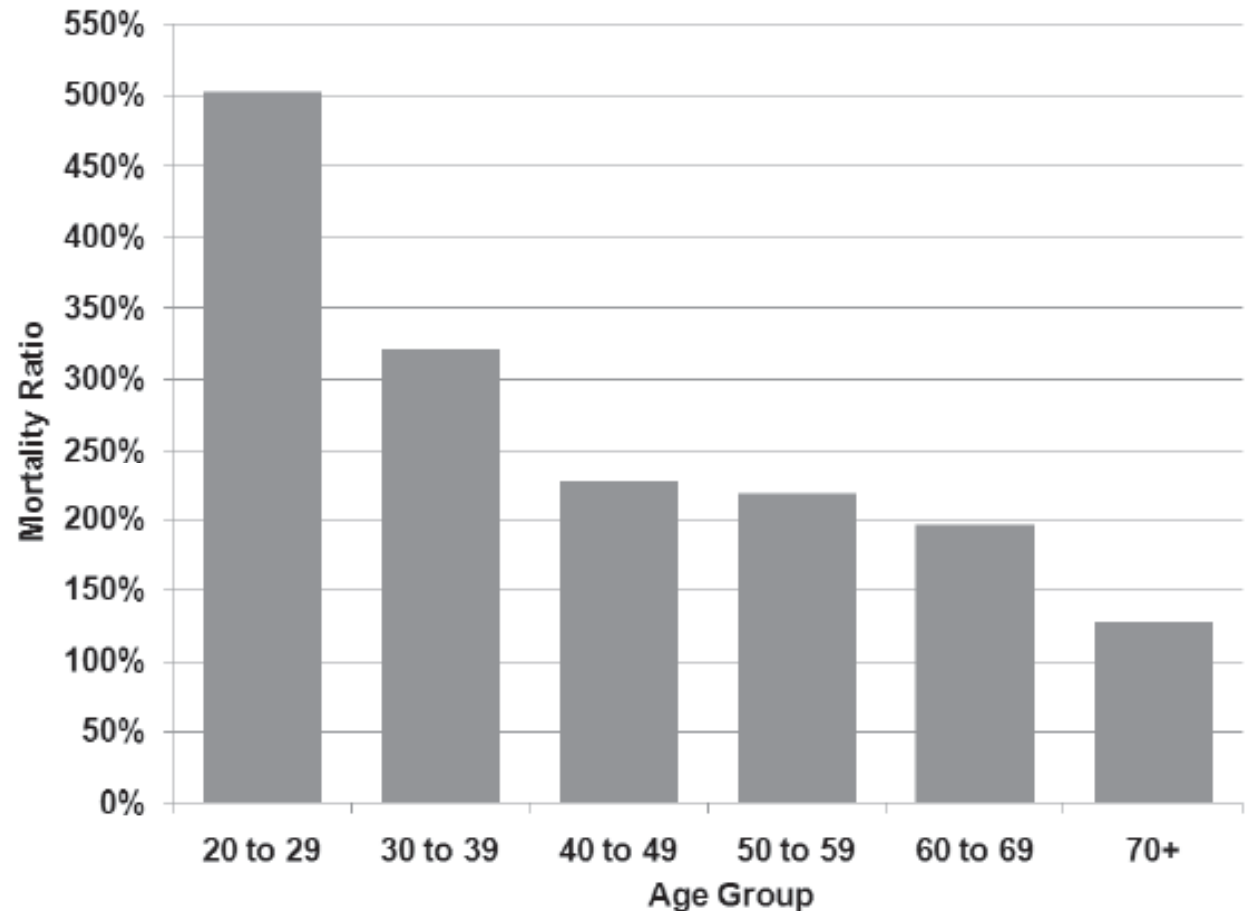
- Smoking prevalence in US has dropped dramatically in past 50 years.
- Evidence of leveling-off in past few years
- Much of the observed mortality improvement in past 50 years is attributable to changing mix of smokers and non-smokers, which can only continue so far.



Cocaine and Mortality

- CRL study looked at insurance applicants who tested positive for cocaine.
- Prevalence rates very low, but significantly adverse mortality for those that test positive.

Figure 2. Mortality Ratios for Positive Cocaine Results by Age Group, Male Nonsmokers



Behavior and Mortality

Indirect Effects

Information Asymmetry

When market participants on one side of a transaction have access to better information than the other side



Adverse/Anti Selection

When the attributes of market participants on one side are unfavorable to the other side due to an asymmetric information advantage.

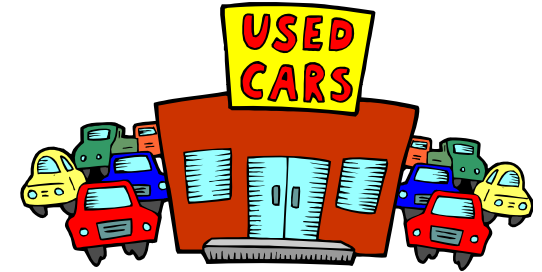
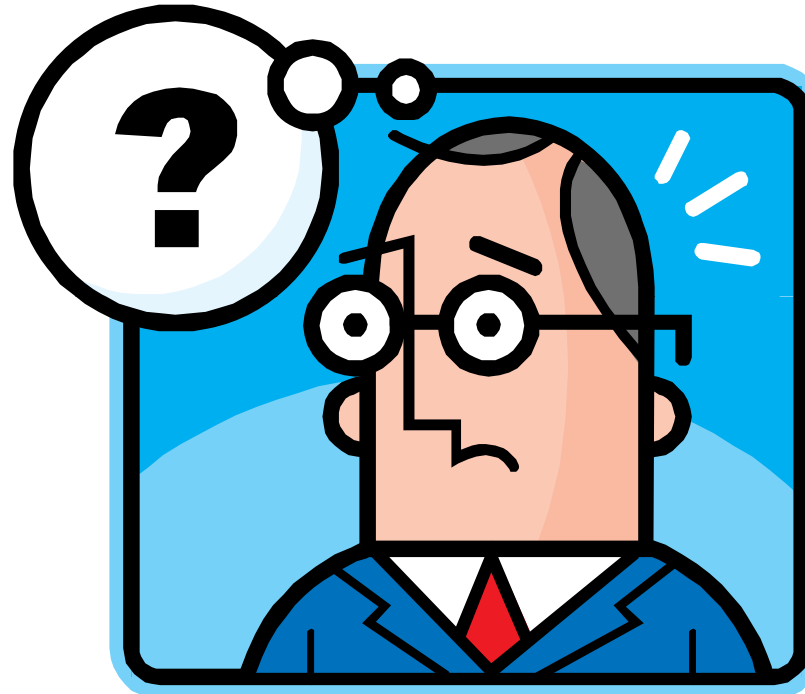
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“On the Internet, nobody knows you’re a dog.”

QUESTION:

How is insurance like the market for used cars?



ANSWER:

Asymmetric information between buyers & sellers!

The Market for “Lemons”

Simple Experiment:

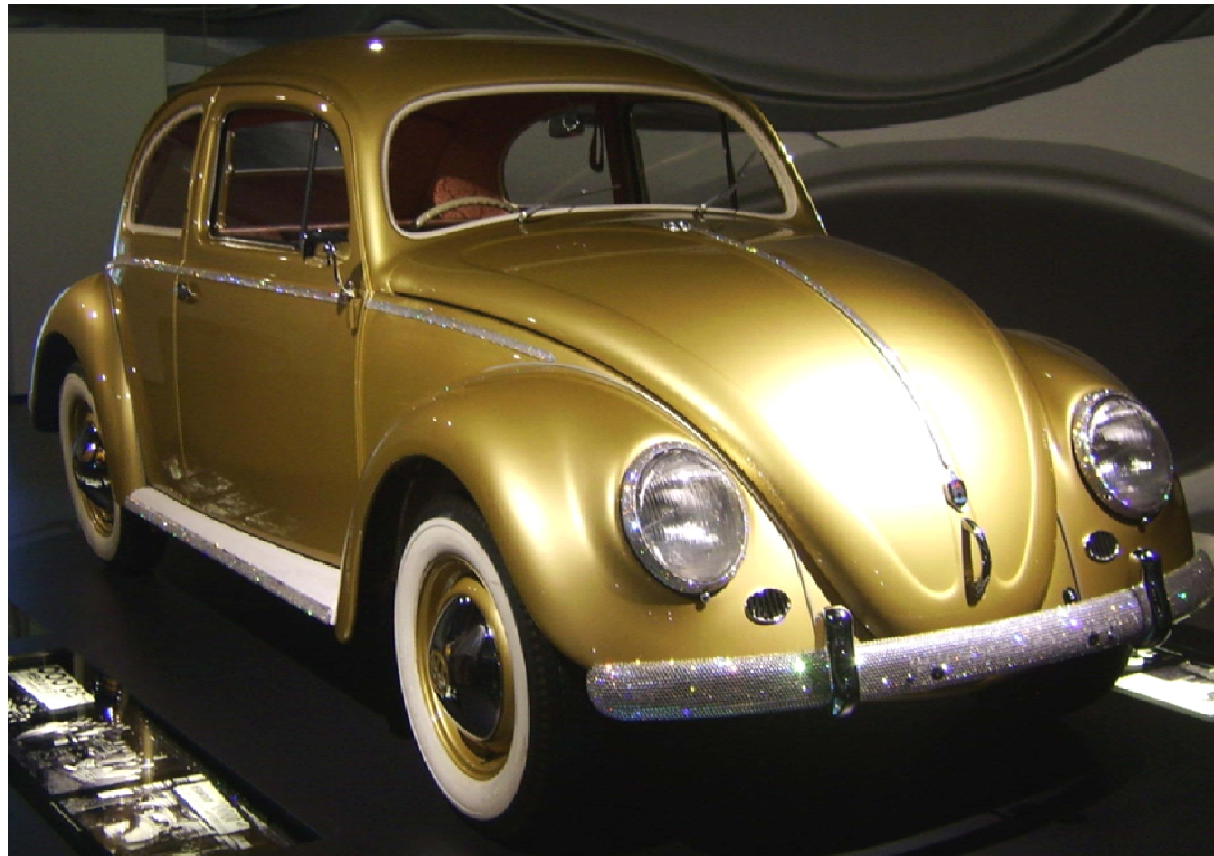
- You are in the market for a good quality used car and are willing to pay up to \$10,000 (USD).



The Market for “Lemons”

Good news! I have a car that I’m willing to sell for \$9,000 (USD).

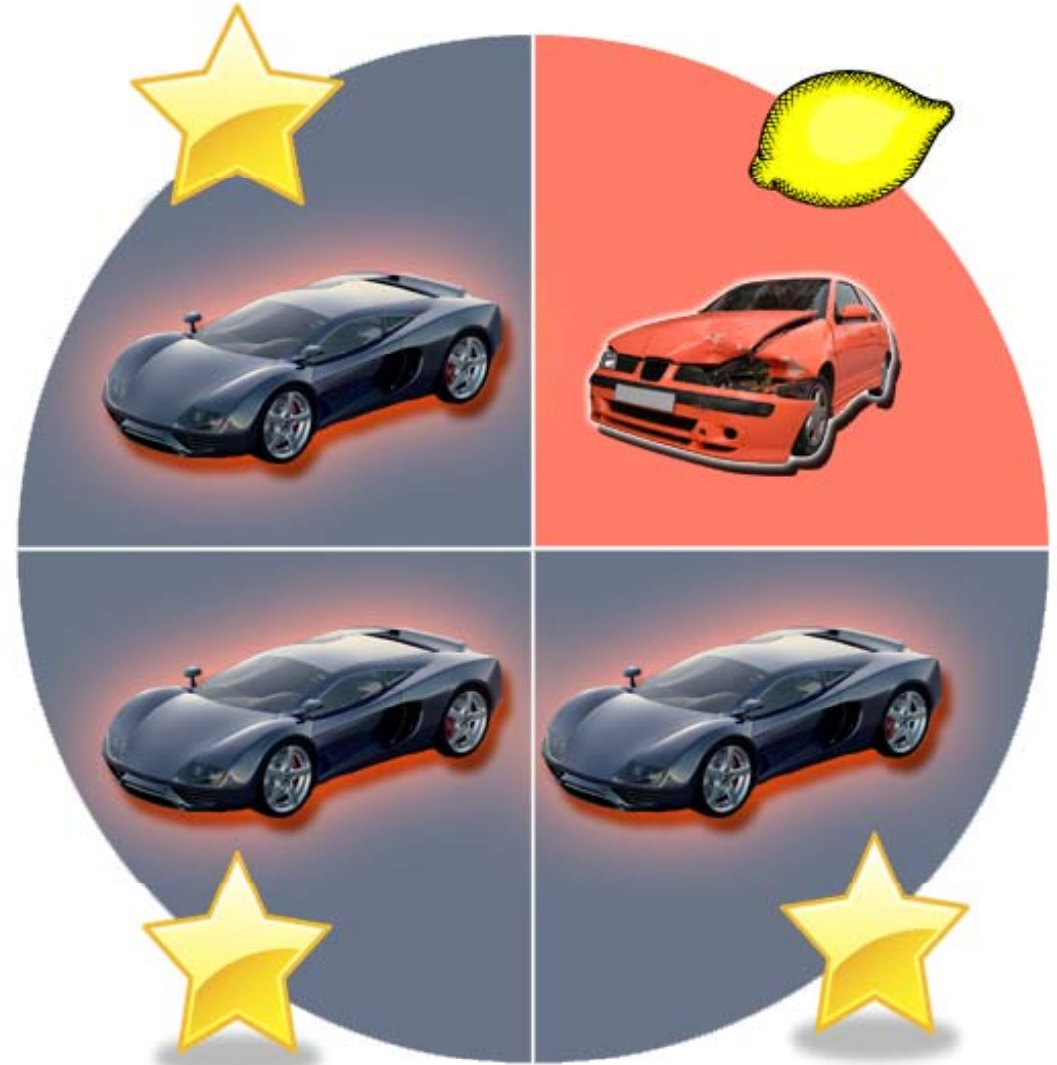
- It is in really good condition – trust me!



The Market for “Lemons”

Assume the following market for used cars:

- 75% of all used cars are in good working order and are worth \$10,000 (USD)
- 25% of all used cars are “lemons” and are worth \$2,000 (USD).
- There is no way to tell a good car from a lemon.



The Market for “Lemons”

So what happens next?

- Without any verifiable information about my car or my personal trustworthiness, you have to factor in the risk of getting a lemon

Therefore, your expected value of my car =

$$(0.75 * \$10,000) + (0.25 * \$2,000) = \mathbf{\$8,000}$$

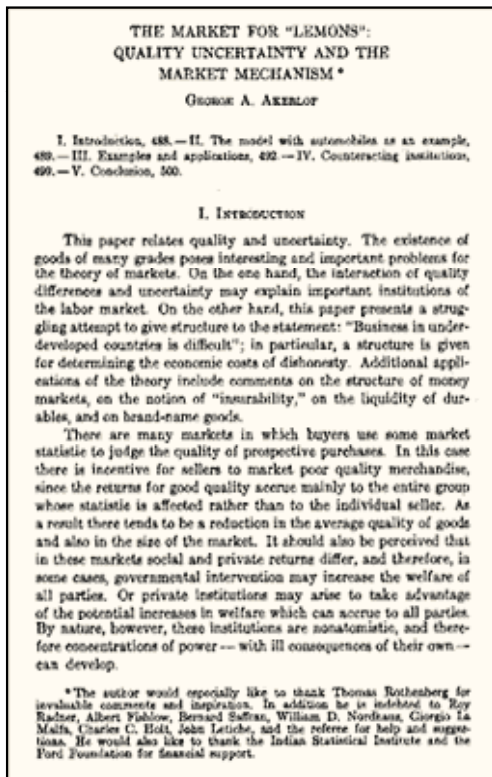
- You aren't willing to spend more than \$8,000, but I won't sell for less than \$9,000 (unless I know my car is a lemon...)



The Market for “Lemons”



George Akerlof’s “Lemons” model (Nobel Prize, 2001) predicts the break-down in markets with asymmetric information.



- The basic problem: Buyers and sellers often don't have access to the same information (or they can't verify the accuracy of the information provided by the other party).
- Rational buyers are worried that they might be buying a lemon, so sellers of good cars can't get fair value.
- This creates an unraveling market on both sides:
 - Sellers with perfectly good cars can't sell them for a fair price
 - Buyers looking for good cars are increasingly likely to get stuck with a lemon.

Information Asymmetry and Insurance

Applicant



- Knows detailed information about her medical history
- Voluntarily enters insurance market
- Demand is correlated to riskiness

Insurer



- Has access to less information than applicant
- Must determine risk-appropriate rate for all applicants

When?

Any applicant/policyholder decision or action presents an opportunity for anti-selection

- Where to apply
- Which company's product to purchase
- Which type of coverage or product to purchase
- How much coverage to apply for
- Which riders or supplemental benefits to choose
- Whether to lapse or stay in-force
- Whether to increase or decrease coverage amount
- Whether to convert and which product to convert into
- Behaviors to engage in once insured (moral hazard)

Goals of the Insurance Underwriting Process

Primary Goals

- Minimize adverse selection by reducing information asymmetry
- Accurately assess risk profile
- Uncover existence and severity of medical impairments
- Provide sentinel to discourage agent/applicant anti-selection

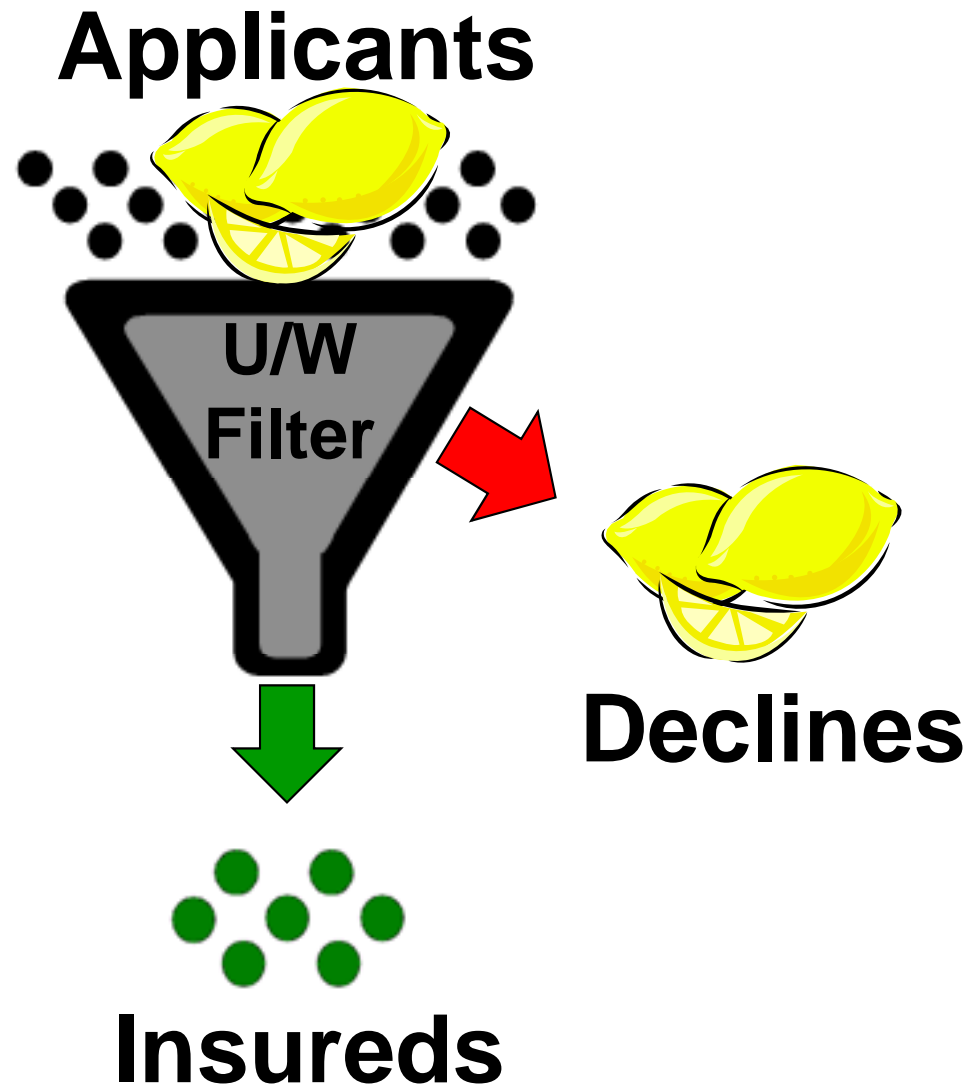


Secondary Goals

- Make decisions as quickly as possible
- Minimize intrusiveness to applicant and agent
- Minimize underwriting costs
- Maximize case placement rates

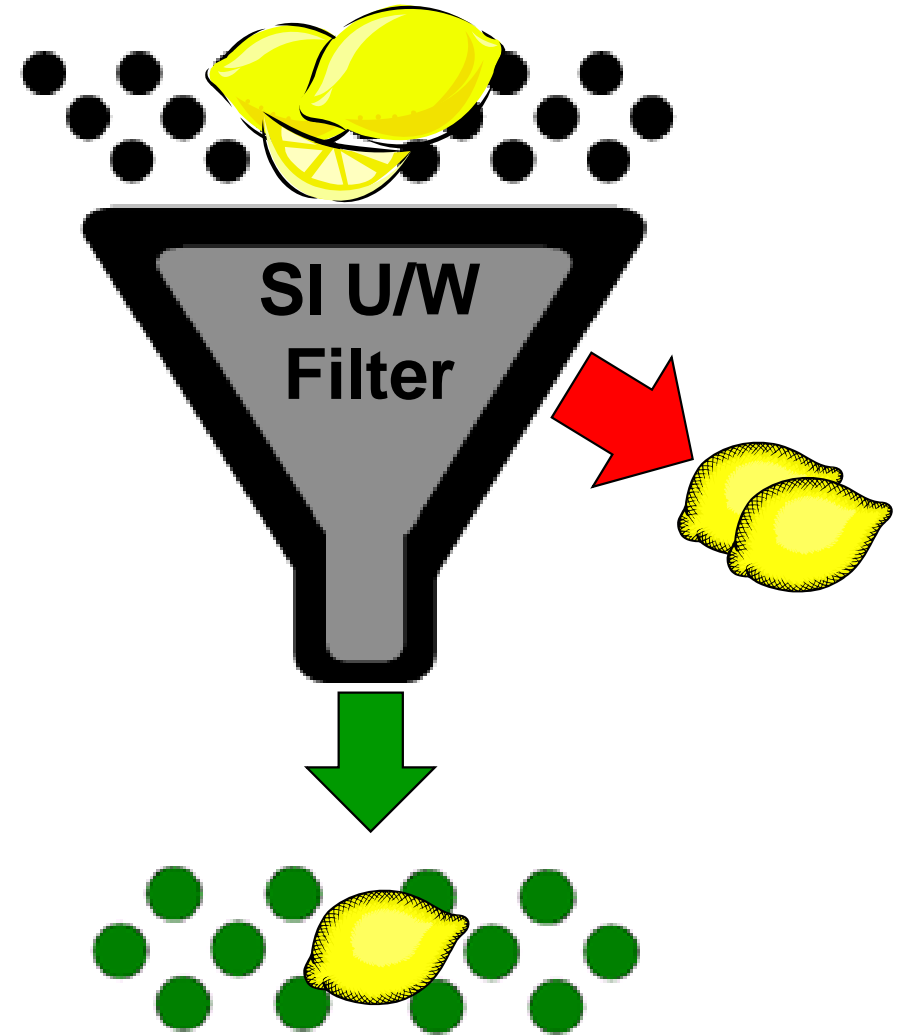
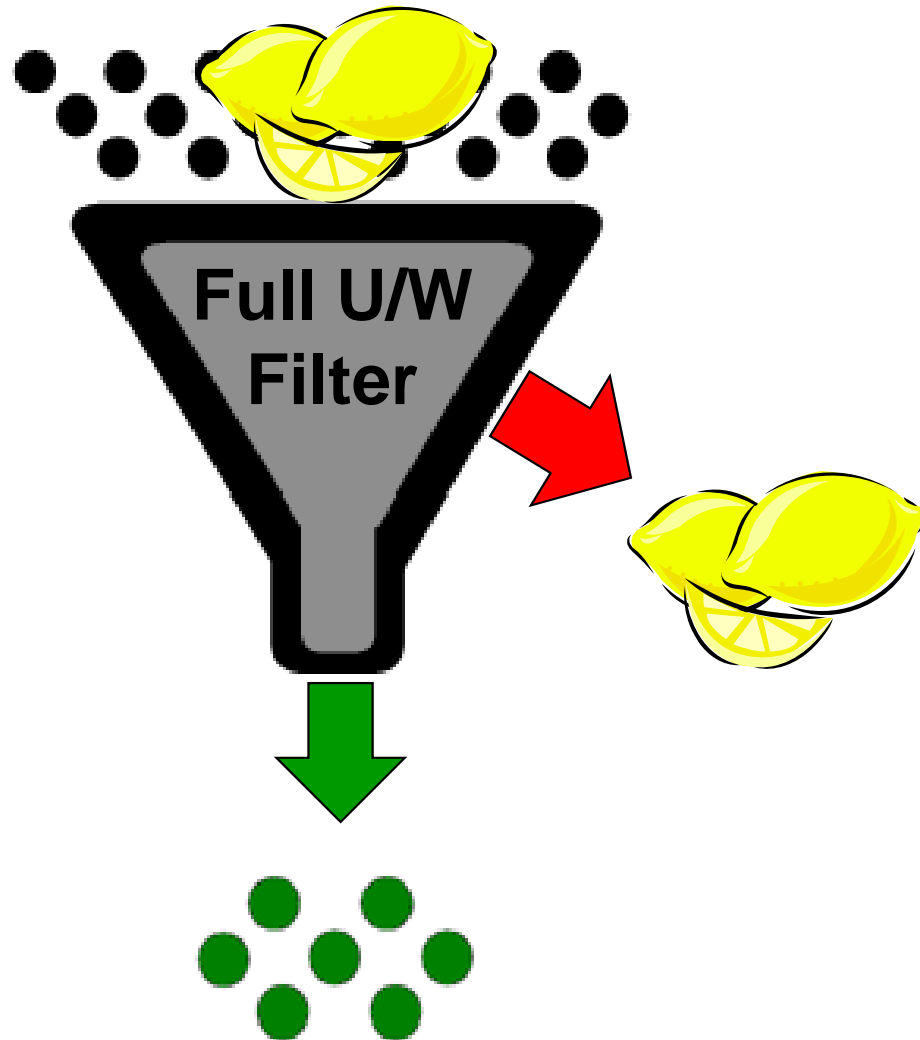
Underwriting Process

Underwriting screening reduces the information asymmetry between applicants and insurer



Simplified Issue Underwriting

SI improves secondary u/w goals but a few “lemons” may get through



Simplified Issue Experience

- In U.S., industry experience for simplified issue business is much worse than for underwritten policies sold at similar face amounts.

Why?

Placed case mortality is determined by:

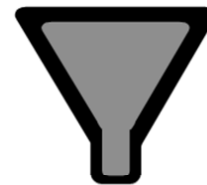
A) Applicant Pool Mortality



PLUS

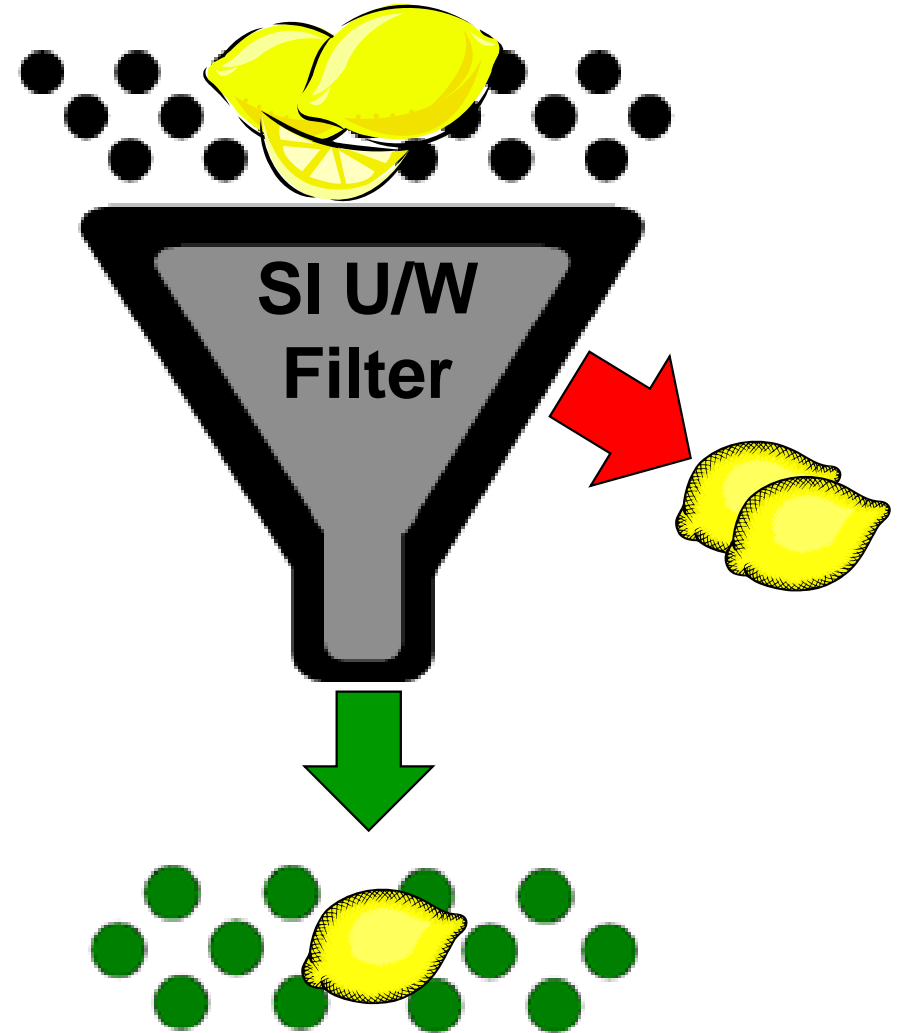
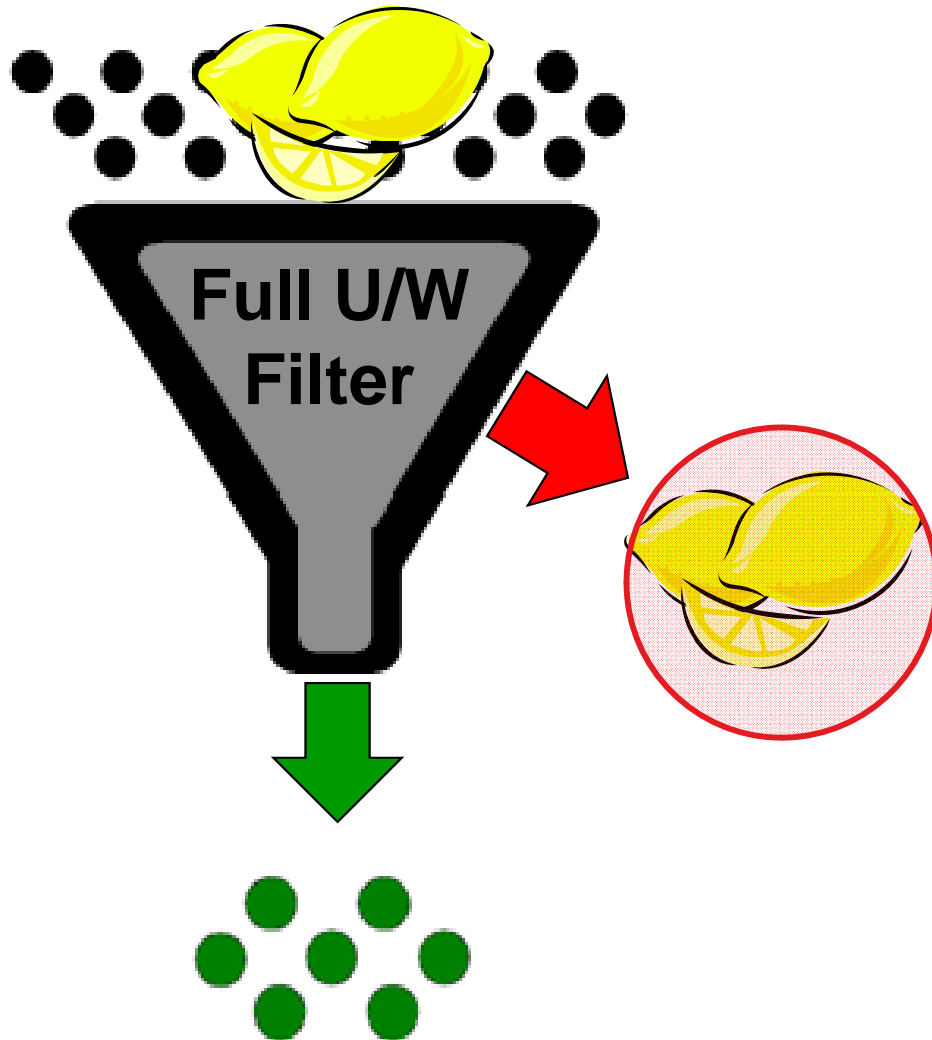


B) Underwriting Filter



Simplified Issue Underwriting

What happens to the fully underwritten declines?

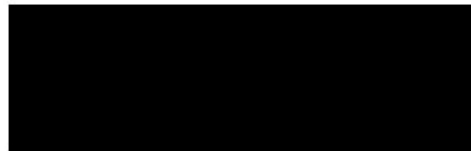


What happens to the Fully UW Declines?

**DECLINED
\$250,000**

- Graded Death Benefit 10, 20, or 30-Year Term & Whole Life
- Face Amounts Up To \$250,000
- Issued Ages 20 to 75
- No Medical Exams, No APS, No Tests
- Accept/Reject Depends on Answers to the Health Questions
- No Lengthy Approval Process
- Rapid Add Online Application Available (electronic signatures)
- A.M. Best Rated A- ("Excellent")¹

For more information contact



Impaired Risk

Life Insurance

Research & Rescue

For Rated and Declined Cases

The Impaired Risk Life Underwriting Specialists

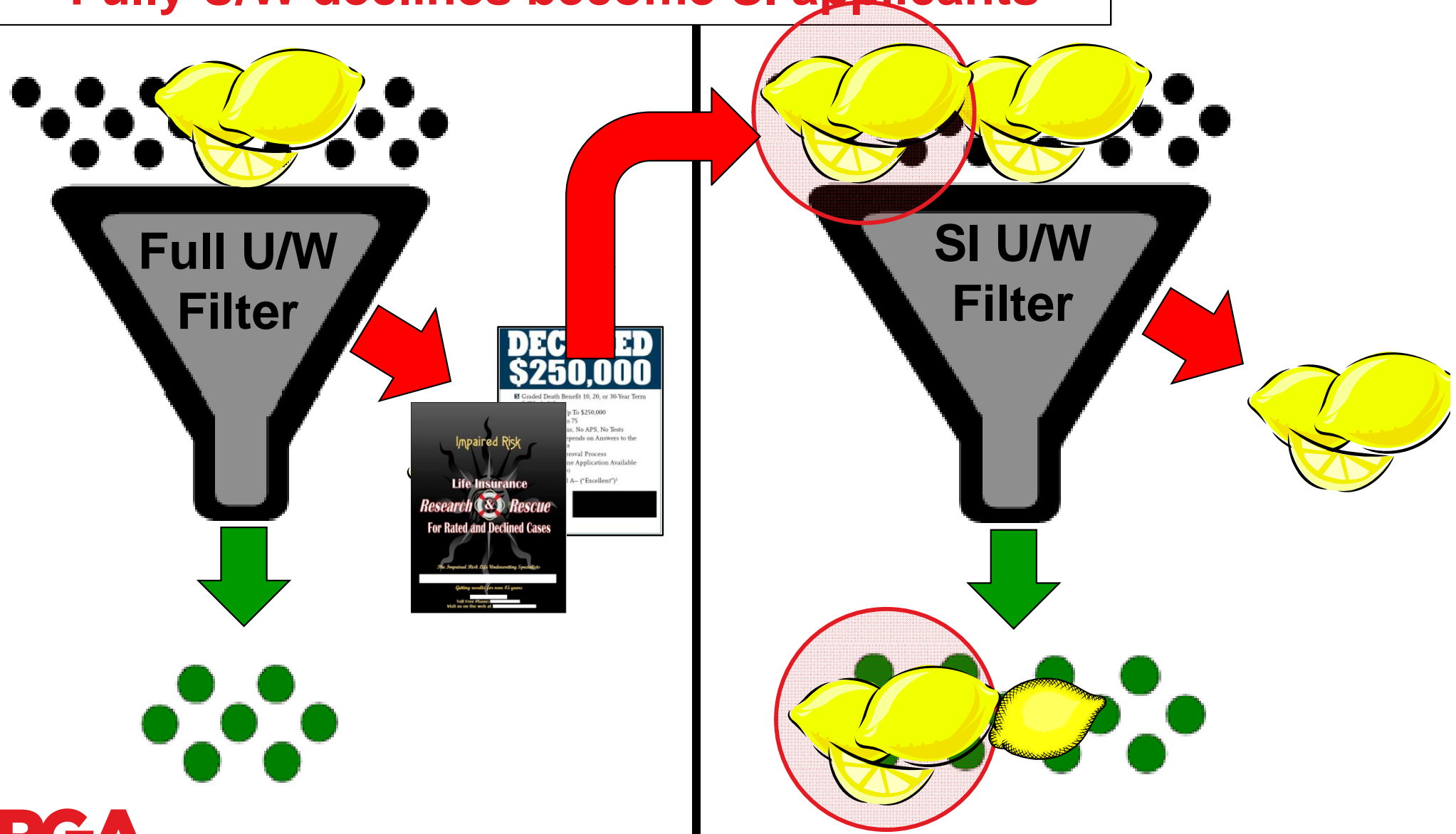
Getting results for over 45 years

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Simplified Issue

The applicant pool begins to change when Fully U/W declines become SI applicants



What About Those Who Don't Bother Applying for Fully UW?

Home | About Us | How To Choose | Underwriting | FAQs | Instant Quotes



Life Insurance for Pot Smokers

Individuals who are afraid of needles or revealing health conditions through blood and urine tests for life insurance have an alternative. [REDACTED] offers individuals a simple and quick way of getting a policy completely online. Answering seven simple questions can mean instant coverage for a qualified individual.

Life Insurance for Pot Smokers - No Med Exam Required


[REDACTED] - June 30, 2008 - For a long time people have kept from getting a life insurance policy due to health conditions, the need to protect privacy or lack of time. With [REDACTED].com, obtaining quality health insurance is no longer an issue. No paramed exams are required; instead only seven questions must be answered to determine if the applicant is eligible.

Pot smokers and others who feel the need to stray from a life insurance policy to save their reputation can use [REDACTED].com to get a quick quote and, most of the time, instant coverage. Individuals no longer have to fear their health conditions or bad habits being reported on their permanent record.

[REDACTED], the advisor and public face for the site agrees. "People are more concerned about their privacy, and know that information from a life insurance paramed exam can end up on their permanent record. Now they have the option of quickly getting life insurance coverage without having to submit to invasive blood or urine tests."

[REDACTED].com helps individuals by offering a way to protect their privacy while getting the insurance they need to protect their loved ones. Just like a credit application for a new car or home, [REDACTED].com immediately checks the individual's medical history on their "MIB Consumer File" at www.mib.com. This is a national database that all North American

PROBLEM CASES?



It's a Jungle Out There!

OVERWEIGHT - 5'2", 300 LBS ...	NO PROBLEM!
JUVENILE & INSULIN DEPENDENT DIABETICS ...	NO PROBLEM!
ANGIOPLASTIES AND HEART BYPASS ...	NO PROBLEM!
CANCERS - SUCCESSFULLY TREATED ...	NO PROBLEM!
OLDER AGES 70 - 90 ...	NO PROBLEM!
NON-SMOKER RATES FOR TOBACCO USERS ...	NO PROBLEM!

WHEN YOU HAVE A PROBLEM CASE . . .

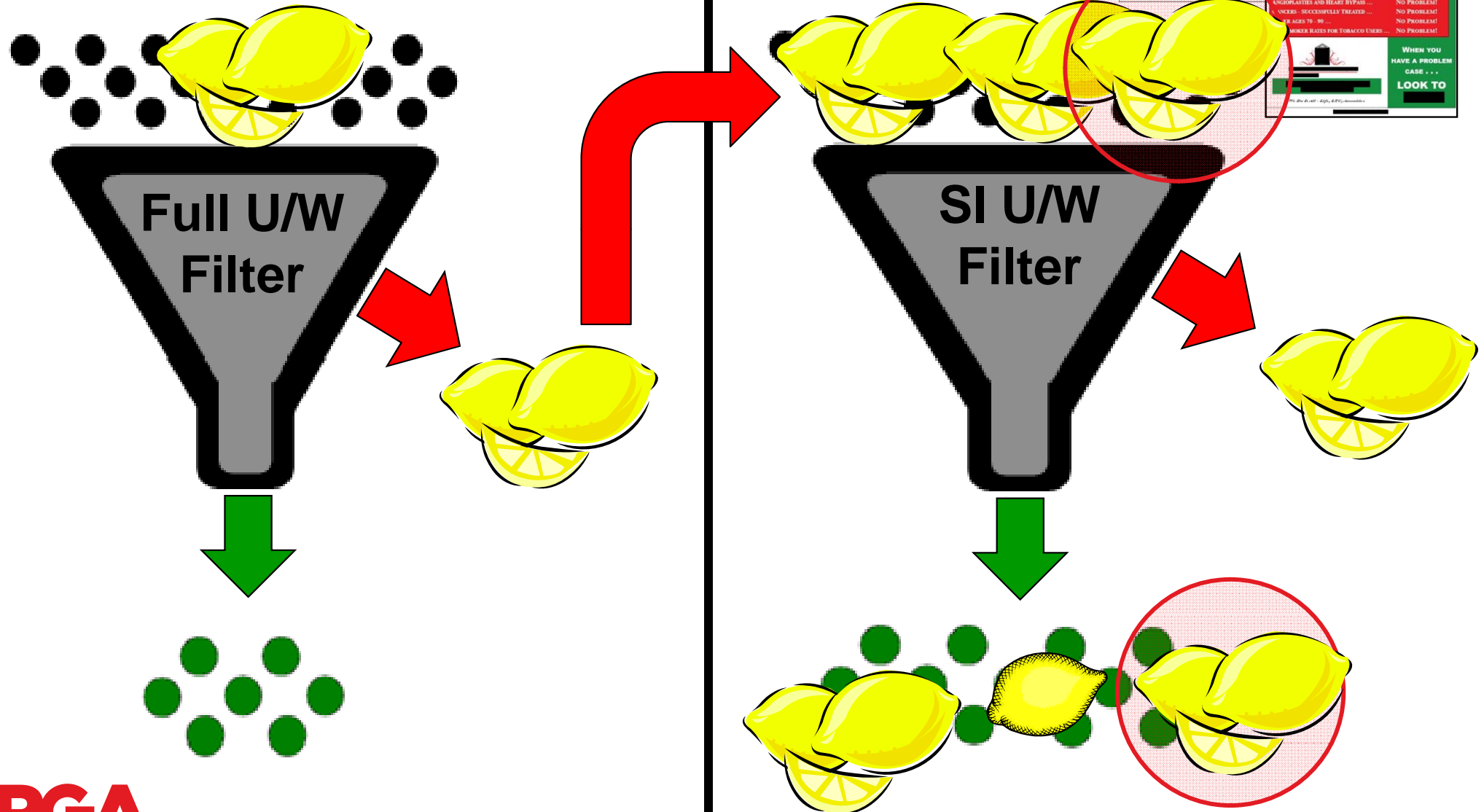
LOOK TO



We Do It All - Life, LTC, Annuities

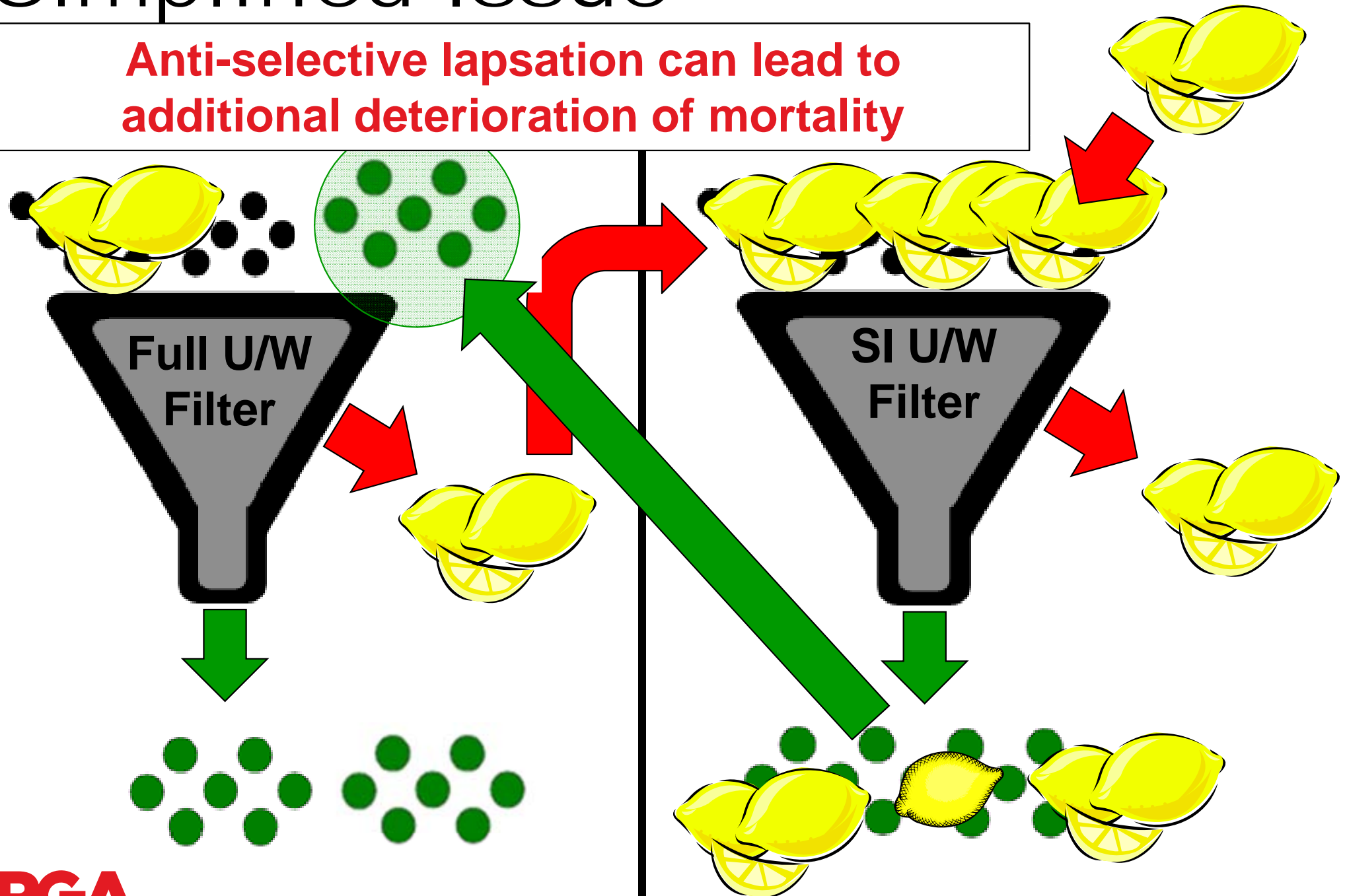
Simplified Issue

Reduced sentinels may encourage more adverse changes to applicant pool



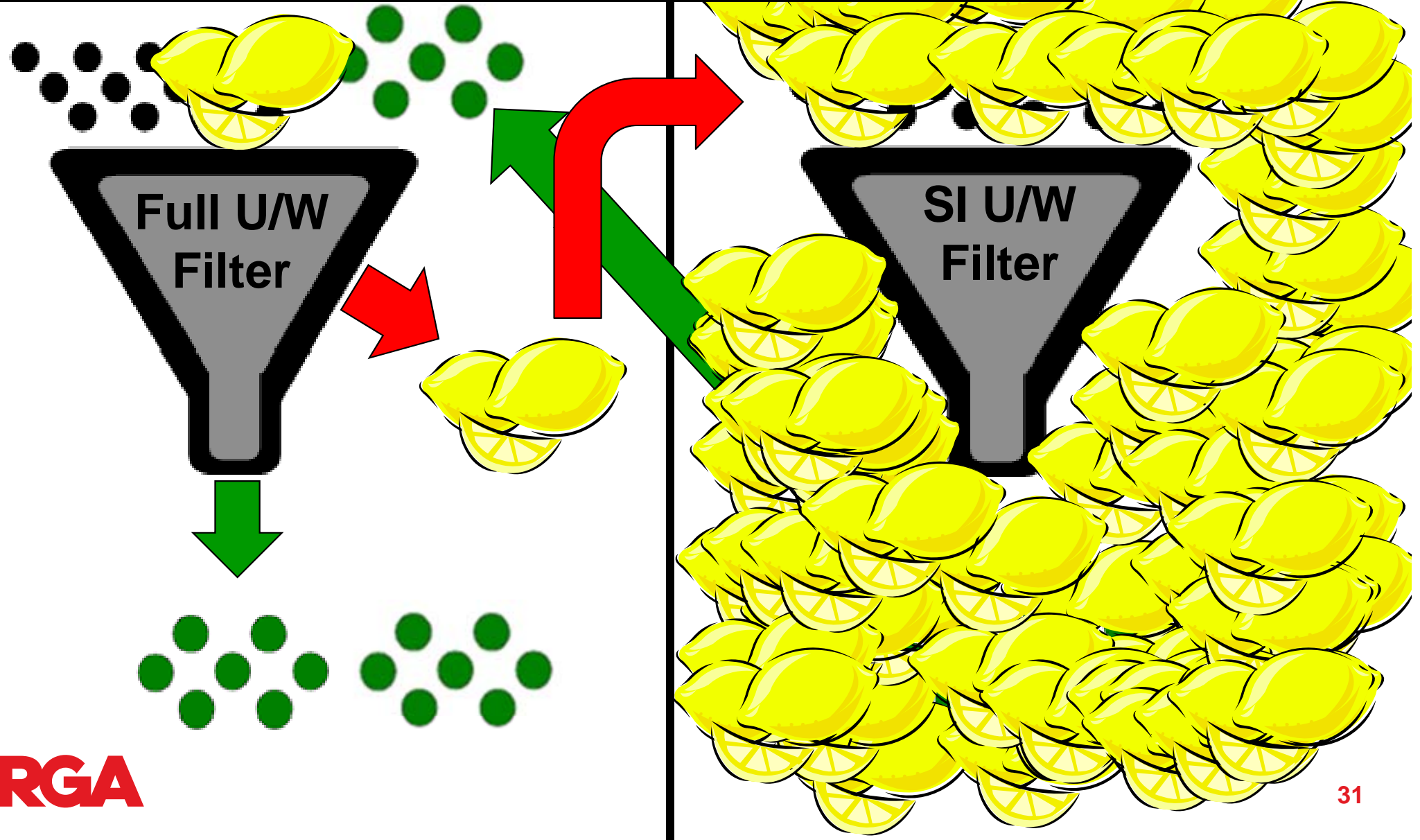
Simplified Issue

Anti-selective lapsation can lead to additional deterioration of mortality



Simplified Issue

The market can unravel as information asymmetry and anti-selection increase.



Post-Level Term Experience

Post-level term experience is one of the clearest observable demonstrations of anti-selective policyholder behavior.


Report on the
Lapse and Mortality Experience
of Post-Level Premium Period
Term Plans

Sponsored by
The Product Development Section and
The Committee on Life Insurance Research
of the Society of Actuaries

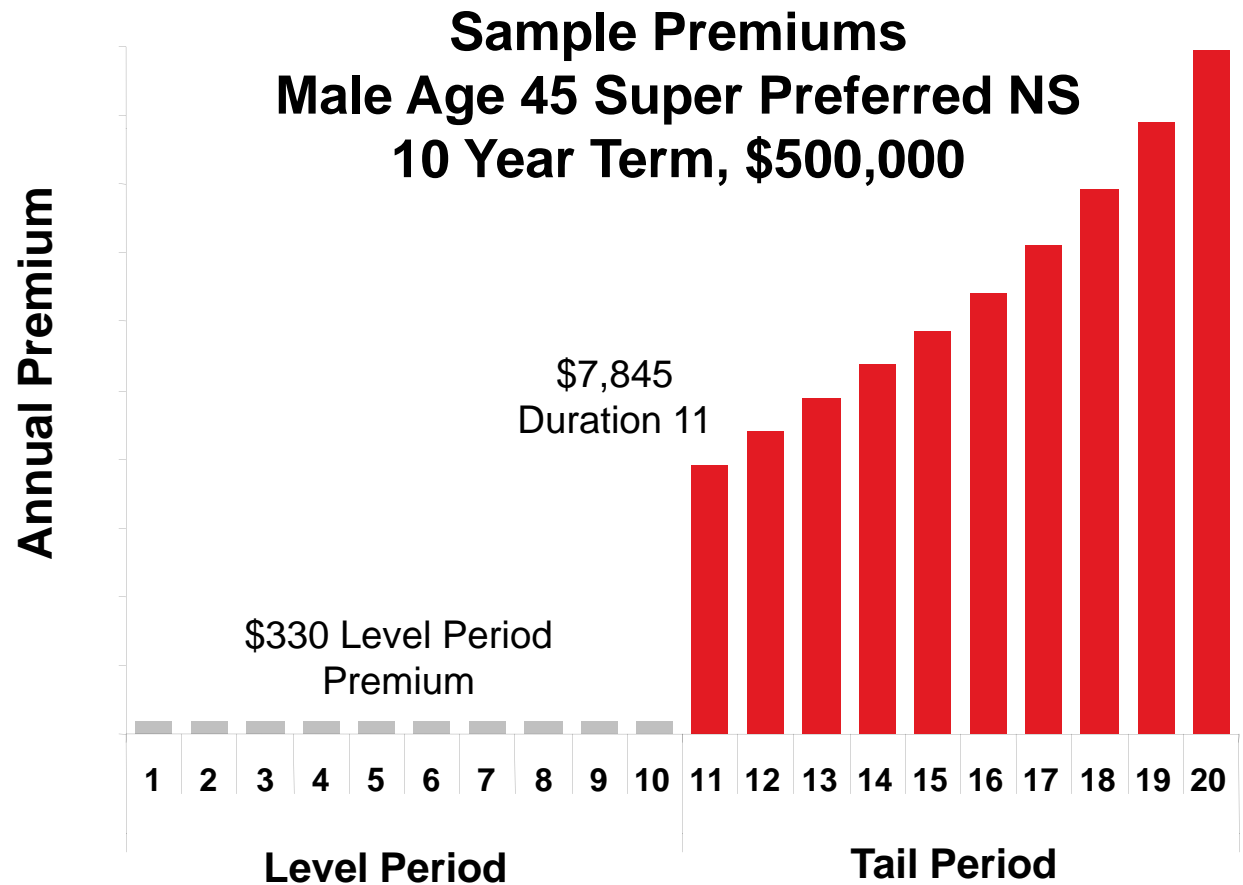
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July 2010

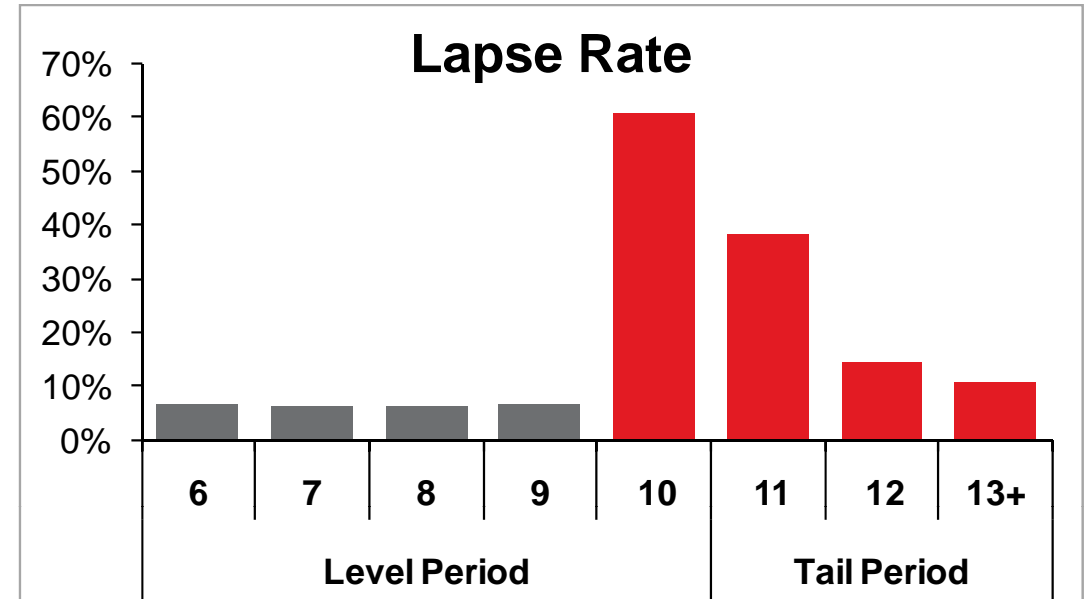


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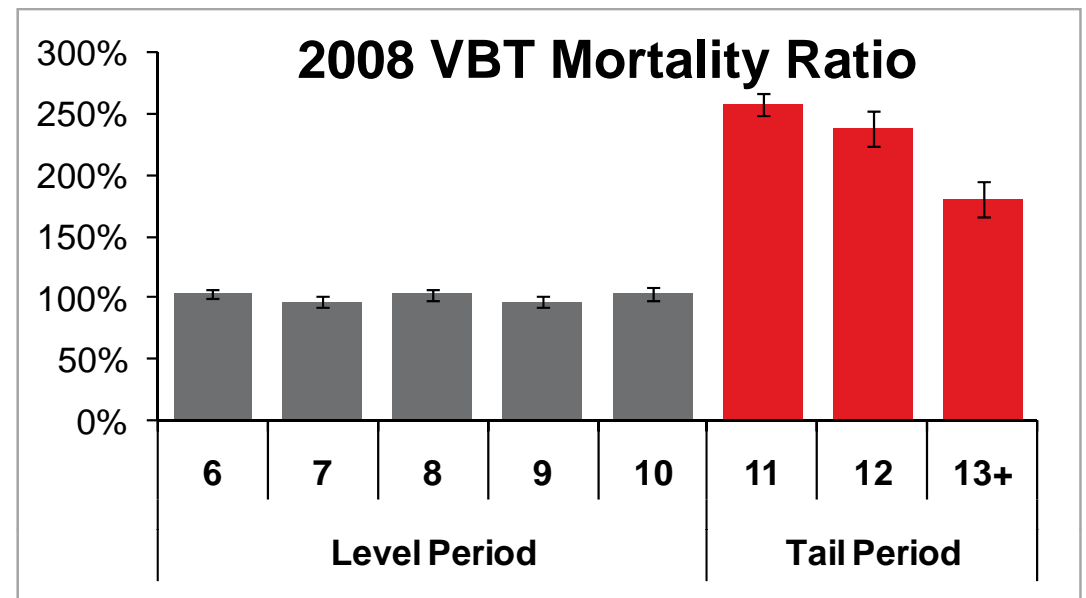


Post-Level Term Experience

- Sharp increase in premium after level period leads to large anti-selective shock lapse.

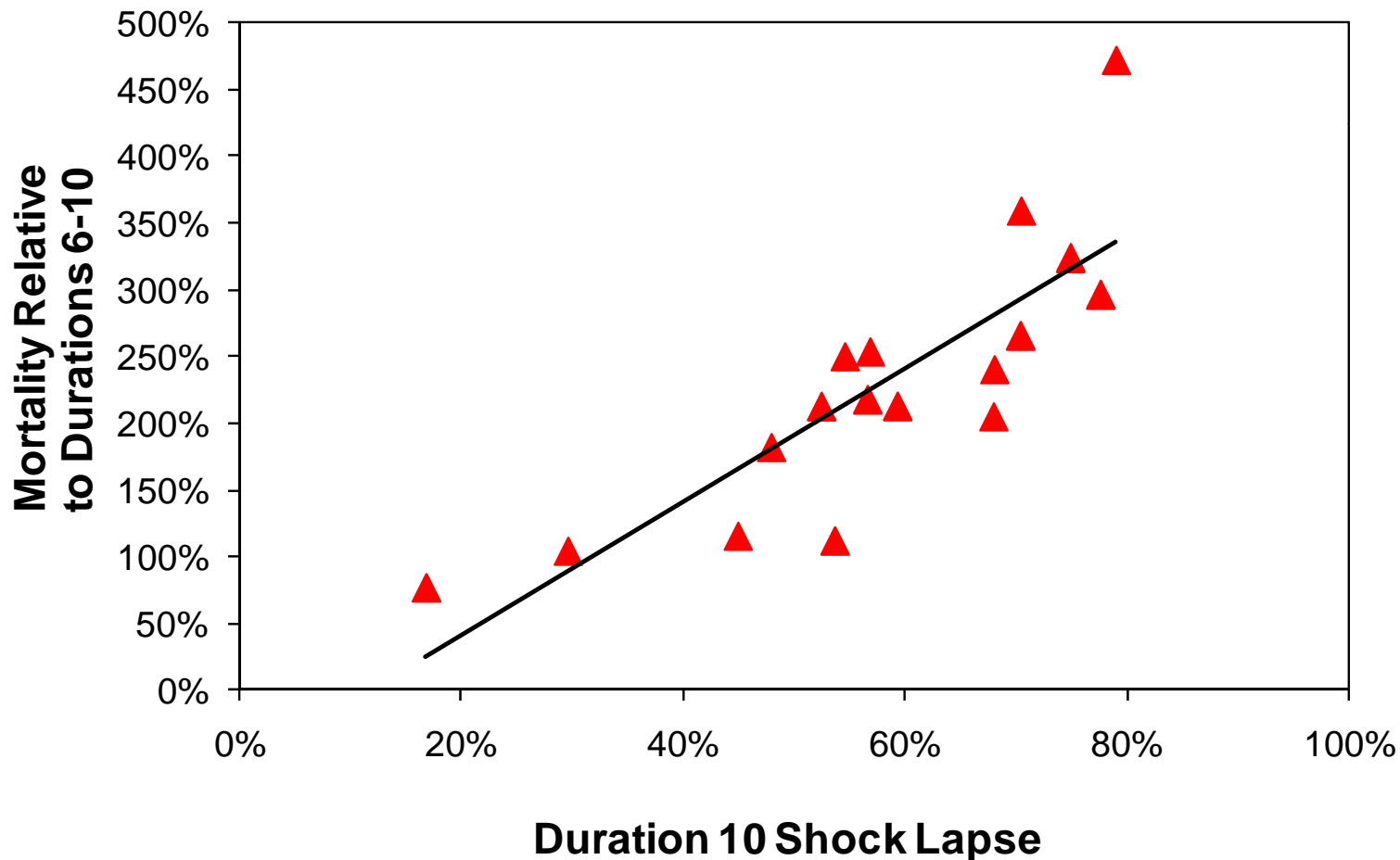


- Mortality on persisting policyholders is substantially worse in the post-level period.



Post-Level Term Experience

- Strong correlation between the size of a company's shock lapse and the amount of post-level period mortality deterioration – the larger the shock lapse, the worse the post-level period mortality.



Impact of Genetic Testing on Insurance Purchasing Behavior

- A genetic test exists for ApoE (e4) and other genetic markers of increased risk for Alzheimer's disease
- REVEAL Study: Randomized controlled trial to evaluate impact of genetic education on adult children of Alzheimer's Disease (AD) patients
 - Control group - Told of AD risk based on age, gender, family history
 - Intervention group - Told of AD risk based on age, gender, family history and ApoE genotype
- Overall, e4 positive subjects 5.8 times more likely to increase LTCI coverage than those who did not receive ApoE genotype disclosure

Large Face Term Mortality

- **Intuition suggests large face amount policies should have better mortality than any other policies:**
 - Higher socio-economic class
 - More rigorous underwriting requirements
-
- **However, U.S. industry experience beginning to suggest mortality is actually worse at higher face amounts.**
-
- 1) Anti-selection: An applicant's demand for insurance is positively correlated with their risk
 - 2) Moral Hazard: Higher suicide and other accident mortality at larger face amounts

Harbingers of Increased Anti-Selection

- **Underwriting protocol outside of industry norms**
 - Higher blood testing limits, smoker/gender aggregate ratings, SI
- **Cohorts that might not otherwise qualify**
 - Spouse/child riders, conversions, worksite, SI, counter-offers
- **Insured population under-represented vs. general population**
 - Younger ages, advanced ages, females
- **Product sold beyond insurable need**
 - Large-face policies (CI, Term, LTD), juveniles
- **Business sold by brokers**
 - Maximize leverage from competitive marketplace
- **Lapse rates are higher than average**



Simplified Issue, younger ages, post-level term

Solutions

- Three opportunities to mitigate or manage the impact of behavior on mortality:



1. Pre-issue (applicant pool)



2. Underwriting



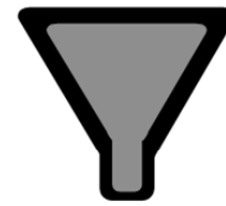
3. Inforce management

Applicant Pool



- Improve sentinels
- Develop differentiated product offerings to respond both to clients' needs and their risk
- Broaden exposure base
 - Contributory, voluntary, or worksite plans have elevated anti-selection compared to non-contributory plans
 - Higher participation rates lead to reduced anti-selection (e.g. COLI, car insurance, non-contributory group coverage, single payer systems)
- Link insurance sale to need or life event
 - Financial planning, education savings, home mortgage
- Price competitively
 - Don't discourage good risks from applying
 - Price increases can lead to death spiral
- Target marketing
 - Pre-filter applicant pool to those who are likely to qualify and likely to buy.

Underwriting Filter



- Maintain sound underwriting practices
 - Don't forget about “primary” underwriting goals
 - Gather the evidence required to assess risk appropriately
- Improve vigilance on financial underwriting
 - Coverage amount should be proportional to need, not risk
- Increase insurers' access to verifiable information on applicants to reduce information asymmetry
 - Health and prescription drug histories, prior underwriting disclosures, motor vehicle records, criminal history, cognitive screening, etc.
 - Reflexive interviews may bring more clarity to application disclosures

Inforce Management

- Maintain sound claims management practices
- Enact “smart” policyholder retention/conversion programs
- Avoid abnormally rich benefits or policy wording that may encourage moral hazard (or malingering).
- Identify targeted cross-marketing opportunities
- Encourage favorable policyholder behavior
 - Wellness credits for health maintenance
 - Progressive Auto Insurance “Snapshot” Program

Conclusions

- Behavioral dynamics should play a big role in how actuaries think about setting actuarial assumptions
- Changes in general population lifestyle factors could have a profound impact on forward-looking mortality expectations
- Sound underwriting will focus on analyzing all reasonable information to identify applicant behaviors that could impact mortality risk
- Do not ignore the “lemons” problem created by increased information asymmetry in simplified issue products.
- Product design should carefully consider the potential for moral hazard and anti-selection

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