



Scottish Re<sup>TM</sup>

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## Preferred Risk Mortality

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June 2007

# Today's Agenda

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- Overview of 2002-2004 SOA Study
- Update on new VBT tables
- Older Age Mortality
- Results by Policy Size
- Slope
- Persistence of Preferred Differentials

# Experience Data

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- **ILEC 2002-2004 Data**
  - Based on experience data from 35 contributing companies
  - Not all submitted usable definitions of preferred criteria
  - More than \$7.4 trillion exposure by amount before adjustments
  - Limited credibility at older issue and attained ages
  - Also true for female and smoker experience
  
- **Preferred focus**
  - Based on experience and guidelines from 28 contributors
  - Preferred experience heavily in policy years 1-5 and almost entirely in 1-10
  - UCS used to assigned scores to each class
  - Currently UCS has limitations around exceptions, debit/credit or point systems, etc.
  - Comparison of UCS algorithm to experience data is messy
    - ◆ Mortality impacted by other factors than just preferred

# New Valuation Basic Tables -- A Number of Issues to Consider

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- **Table structure**
  - What ages
  - Select period
- **Variance by policy size**
- **Older ages and ultimate ages**
- **Preferred**
  - How to use data
  - Wear Off
  - How many classes
- **Smoothness vs. Fit**
  - Especially duration 3
- **Other issues**
  - Post level experience in data
  - Effect of passing through different underwriting eras

## Current Course (subject to change!)

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- **Core table development**
  - Age Nearest Birthday
  - Issue ages 0-90
  - 25 year select at core ages (shorter at older ages)
  - \$100,000 - \$2,499,999 experience
  - Grade toward population experience at higher attained ages
  - Do not ever hit mortality rate of 1000/1000
  - Will be improved to calendar year 2008
- **Additional tables to develop**
  - Two additional bands
    - ◆ \$10,000-\$49,999
    - ◆ \$50,000-99,999
    - ◆ Anticipate little difference in ultimate rates
  - ALB variants of all tables
- **Preferred Versions**
  - Develop up to 10 NS and 4 SM versions for preferred utilizing UCS methodology

## Open Issues

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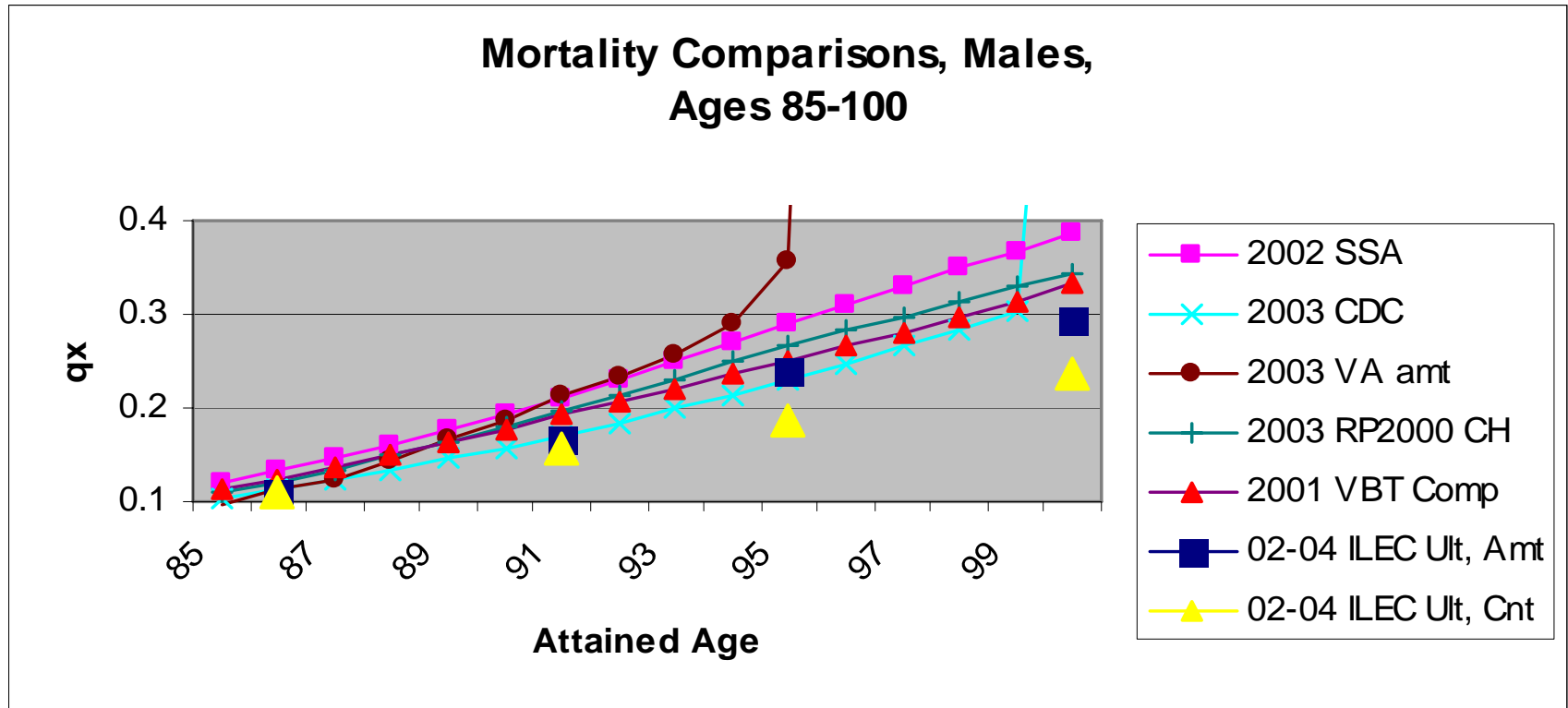
- Smoothness vs. Fit & Duration 3 issues
- Finalize select period for oldest issue ages
- Confirm plans around banding
- Finalize preferred wear off factors
- Develop tables!
- Determine what rate of improvement to use for bring forward to 2008

## Older Issue Ages

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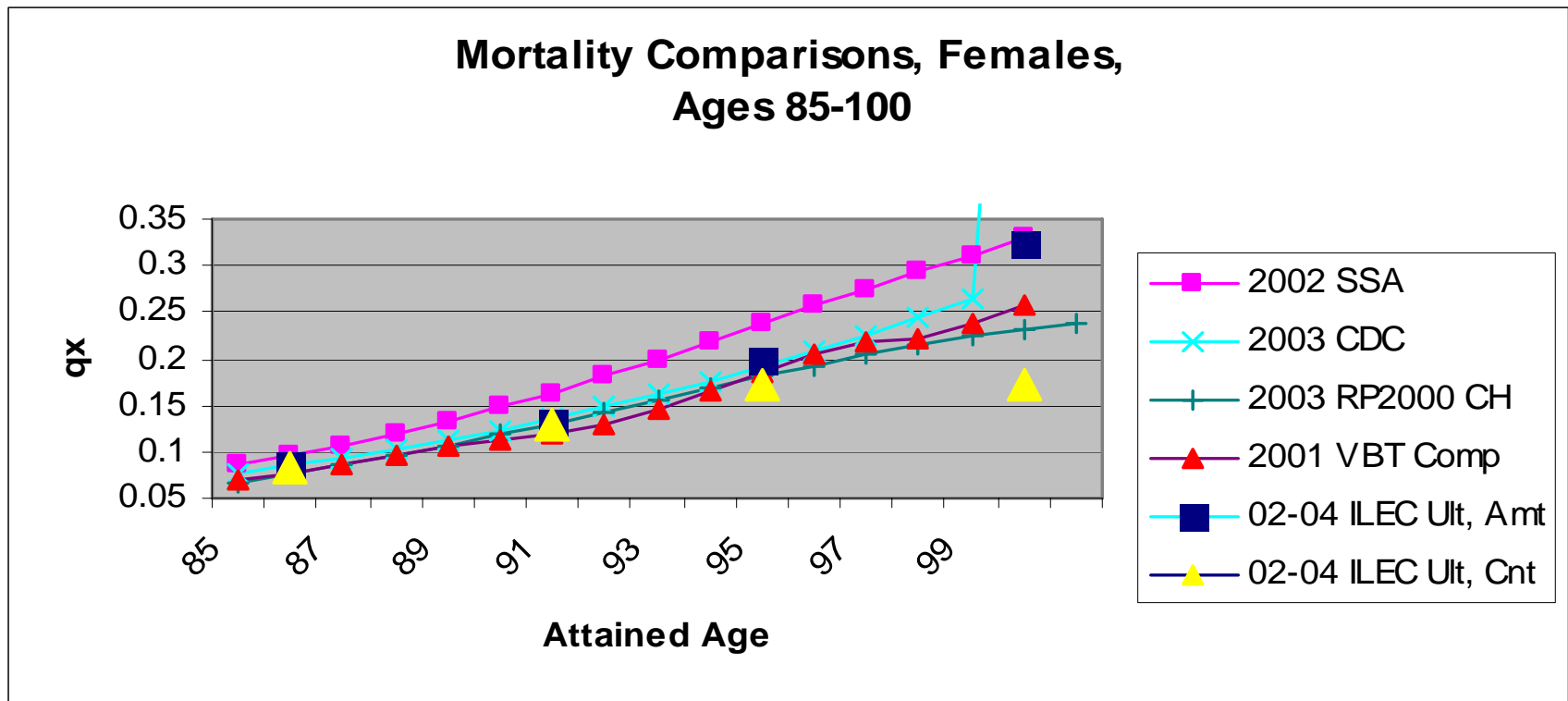
- **Studies continue to have reduced credibility at oldest issue ages and attained ages**
- **Belief that at highest attained ages insured mortality should approach population**
  - Underwriting effects worn off
  - Socio-economic differences largely worn off
- **VBT Committee reviewed alternate data from multiple sources**
- **SSA data deemed the most credible, although highest amongst all sources reviewed**
  - SSA experience based on Medicare death records at older attained ages in 2002
  - Projected to 2003
- **Blend to 0.45 constant rate at attained age 110**
  - Will not have an omega age/rate = 1.000
  - Rate and age based on various published research papers

# SSA v. Other Experience



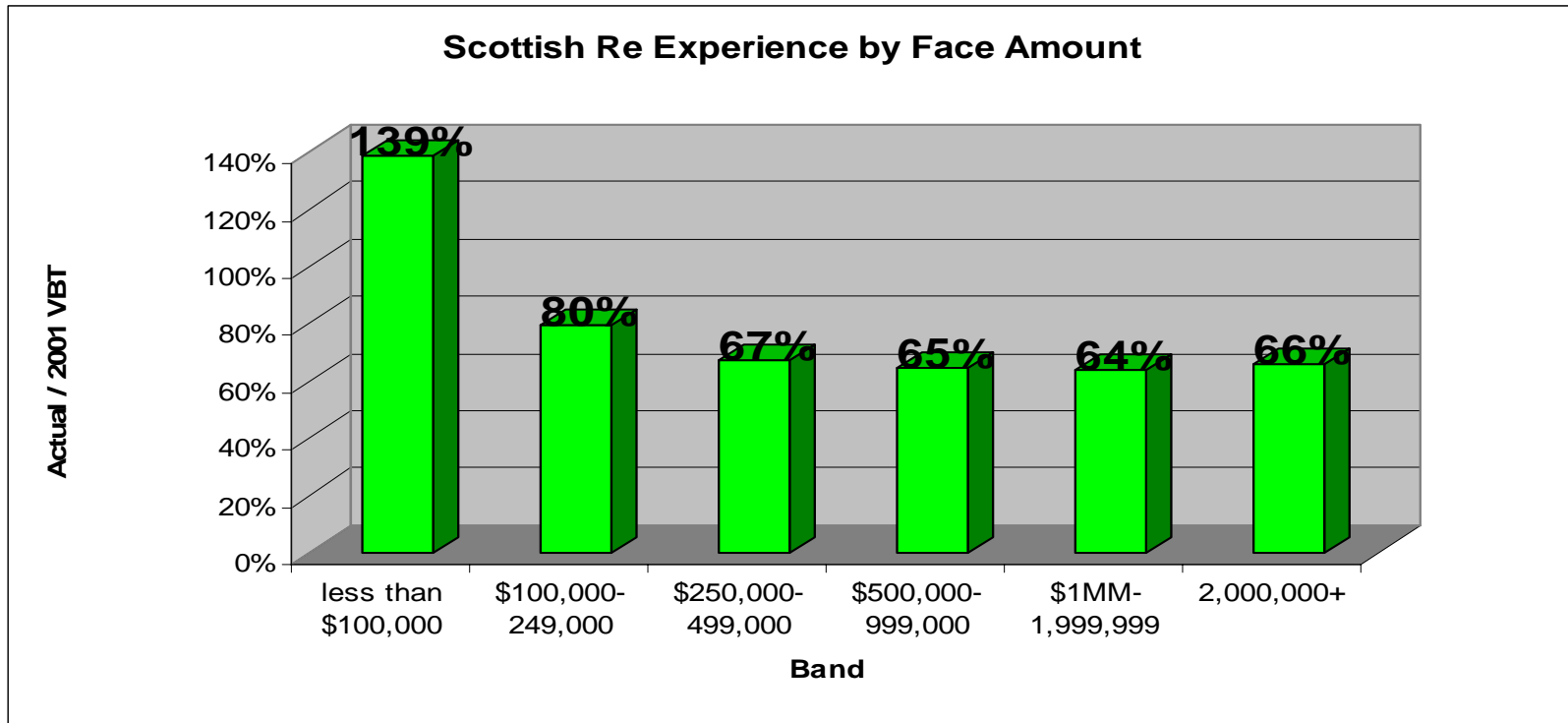


# SSA v. Other Experience



## Variance by Policy Size

- Would expect mortality to vary by policy size
  - More underwriting requirements (typically)
  - Other factors for which policy size is a marker



Scottish Re Experience: 1997-2005 Exposures from 41 ceding companies. 37,684 deaths.

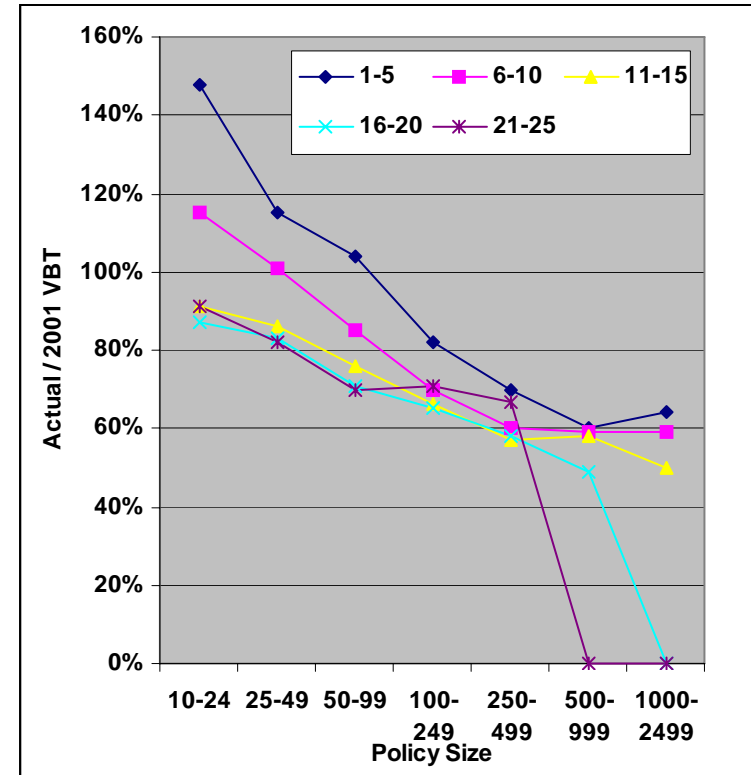
## ILEC Experience by Face Amount

<b>Preliminary A/E by Amount for Various Face Amount Ranges</b> <i>(E = 2001 VBT ANB SM/NS, M/F Distinct)</i>					
Amount Band	Aggregate	MNS	MSM	FNS	FSM
\$10,000 - \$49,900	90.4%	89.7%	100.4%	79.3%	94.6%
\$50,000 - \$99,999	78.6%	77.7%	88.6%	71.9%	84.3%
\$100,000 - \$2,499,999	67.3%	65.4%	78.6%	65.2%	85.2%

# Implications on Slope

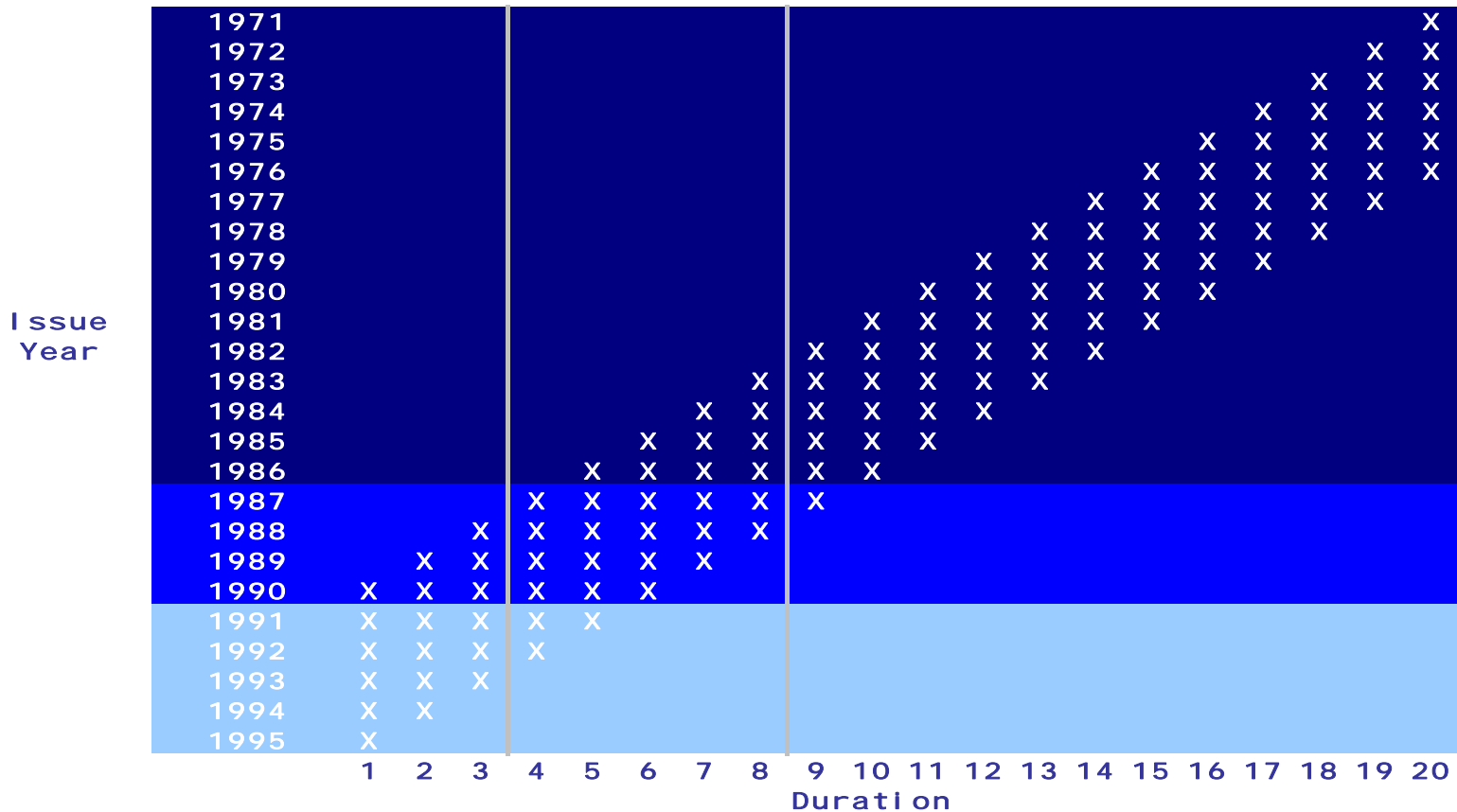
Preliminary ILEC A/E by Size and Duration (Expected = 2001 VBT)

	1-5	6-10	11-15	16-20	21-25	26+
<10	259	133	100	96	107	96
10-24	148	115	91	87	91	87
25-49	115	101	86	83	82	82
50-99	104	85	76	71	70	79
100-249	82	70	66	65	71	81
250-499	70	60	57	58	67	*
500-999	60	59	58	49	*	*
1000-2499	64	59	50	*	*	*
ALL	72	67	64	67	77	88



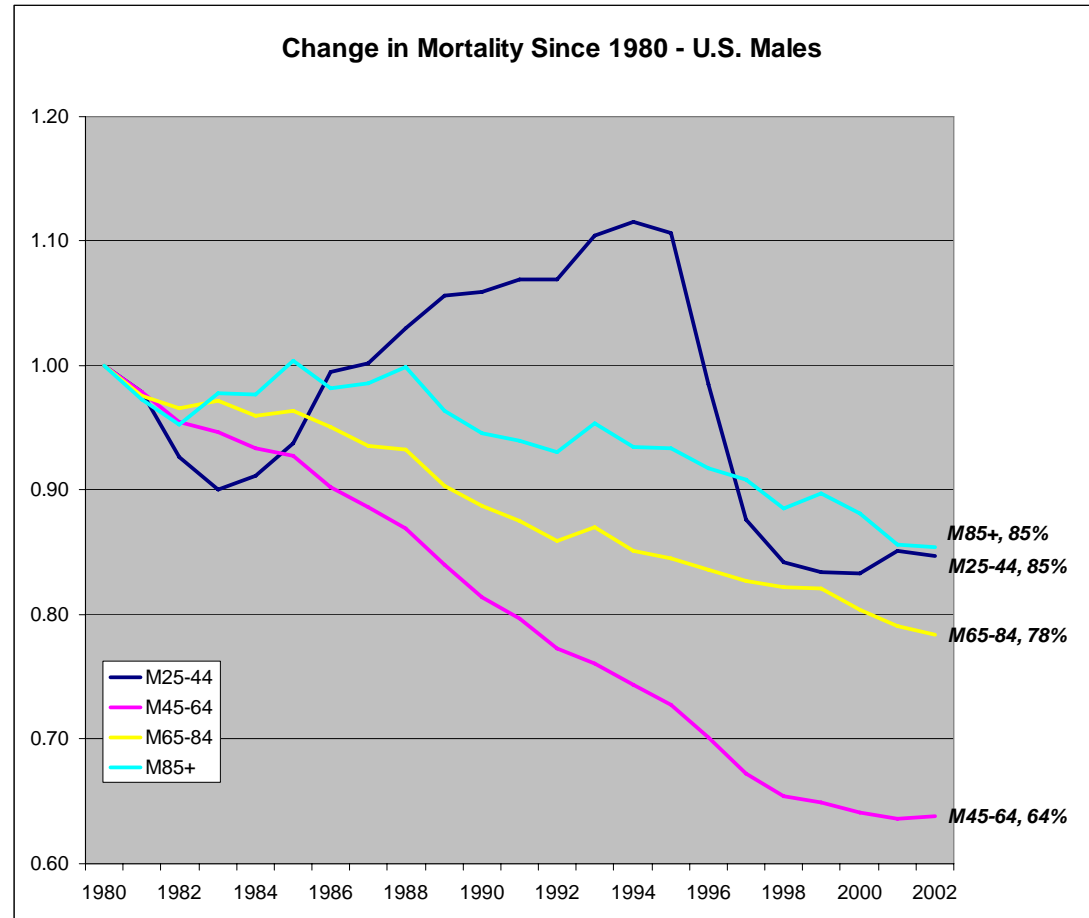
# Overall Slope: 2001 VBT Issues

- Overall results show a somewhat flatter slope over first 15 policy year
- 2001 VBT (and all such tables) suffer from impact of passing through multiple underwriting eras

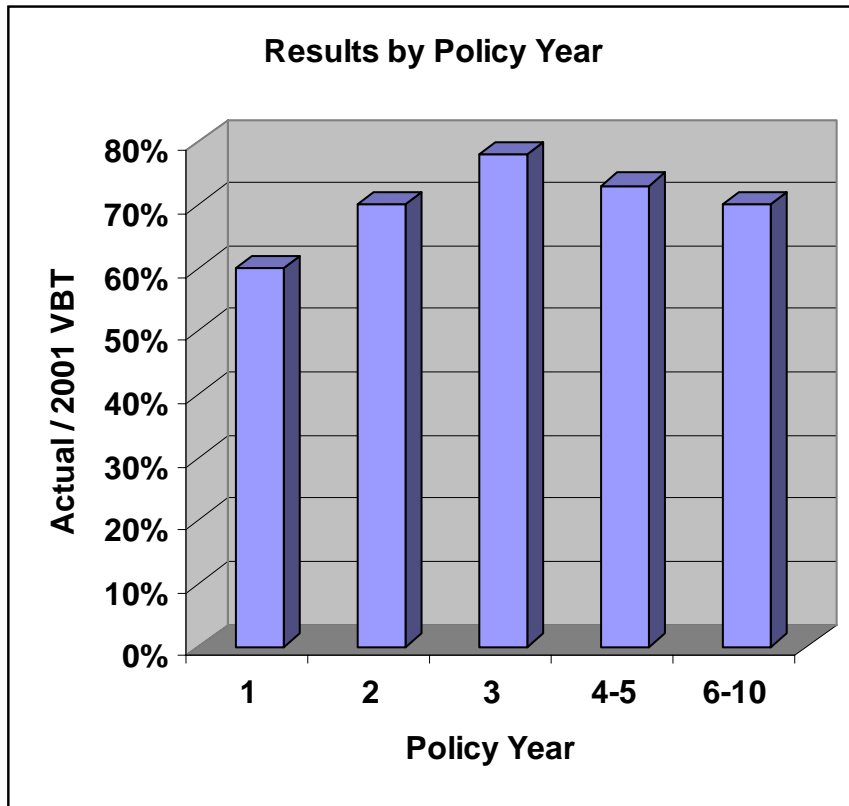


# Underlying Population Improvement Impacts Slope as Well

- Slope is a function of at least two different factors
  - Wear off of underwriting
  - Velocity of mortality increases by attained age
- As mortality improvement varies by age, it impacts slope as well
- Dynamics of past 25 years have flattened slope at younger issue ages and steepened it at oldest ages



## Duration 3



- 2002-2004 data exhibits noticeable bump in mortality at duration 3
- Must make decisions on this issue, and in general, as to whether to focus on fit or smoothness
  - Currently favoring fit
- Other data sources support year 3 bump
  - Also shed some light on areas where the duration 3 hit is focused

## Wearing Off of Preferred Differentials

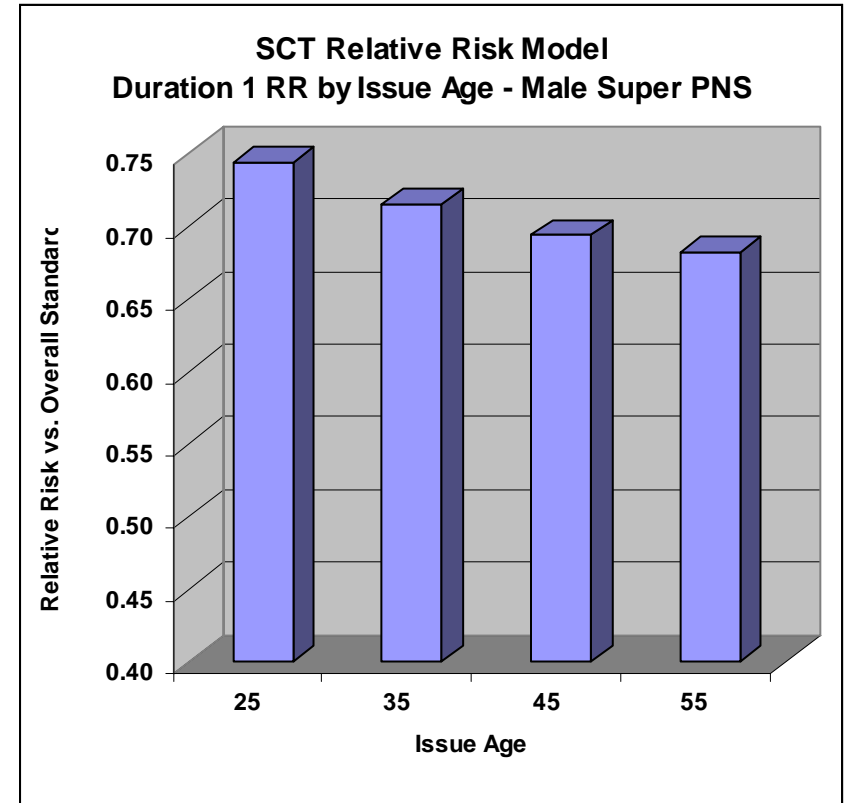
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- **Critical question is how preferred differentials move through time**
- **2002-2004 study has very little preferred data beyond policy year five**
  - Lacking in credibility within first five years if break down to individual durations, issue ages, and risk classes
- **VBT Group has taken into account**
  - Underlying theory around preferred
  - Available data
  - Longer term studies on specific risk factors



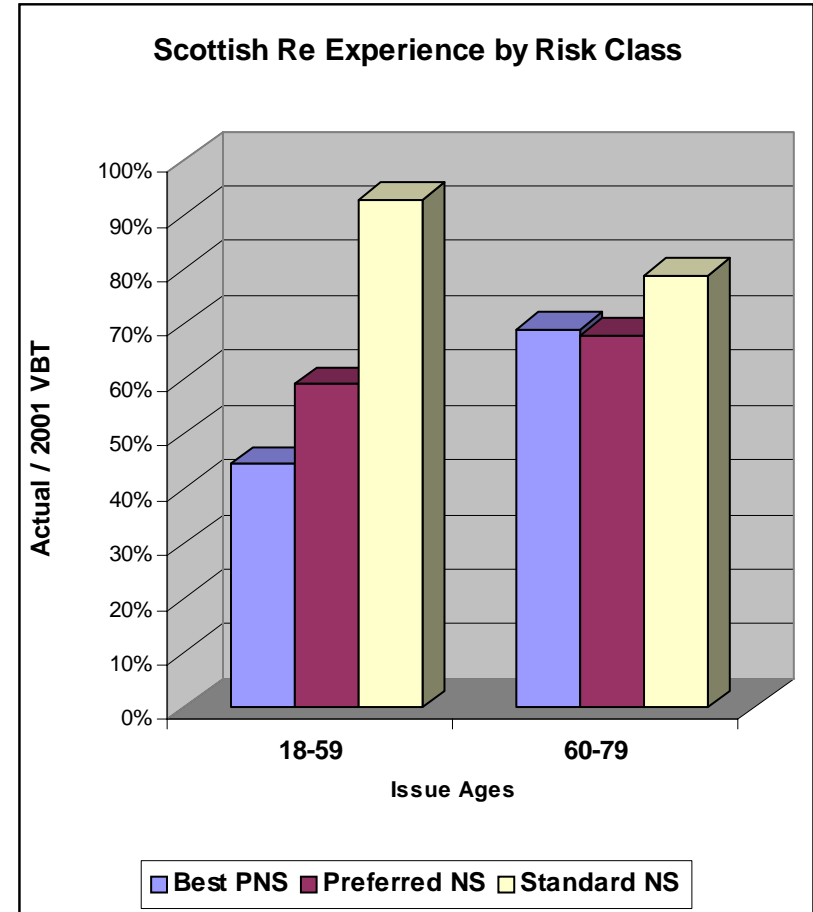
## Preferred Wear Off “In Theory”

- Normal select and ultimate dynamics relate to standard/substandard underwriting
  - Removal from standard of impaired lives
- Preferred underwriting is a stratification of ‘healthy’ lives based on risk factors
  - Predisposition to develop future impairments
- Two competing forces as groups move through time
  - Changes in characteristics
  - Relevance of characteristics
- As attained age increases from 20-60, most preferred criterion become increasingly relevant
  - Premature cardiac deaths centered at 45-65



# Data Exists to Support Reduced Differentiation at Higher Ages

- Experience data supports the notion that the typical preferred criteria become less relevant at older ages
- Some typical criteria become much less relevant for stratifying risk
  - Total cholesterol
  - Height/Weight
- New criteria emerge for which the typical preferred program does not account
  - Serum albumin
  - Cognitive function



Scottish Re experience 1997-2005 exposures from 41 ceding companies for products with 3 or more NT risk classes. 6,403 total deaths.

## Looking At Other Studies

- VBT Group looked to other sources with longer term data on wear off of risk factors

Study	Timeframe	Observations/Conclusions on RR Differentials
Alcoholics	1962-1977	Level through 25 durations
Diabetics	1923-1964	Level/Increasing from age 30-55; Decrease at older
1979 BP Study	1950-1972	Widens through 20 years
Build	1947-1964	Level until older ages, then grades together
CV Family History	1962-1977	Flat to increasing
Cancer Family History	1959-1976	Flat, coming together at 90+

## Current Proposed Wear Off – Grounded in an Attained Aged Basis

Issue Age	Dur 1	Dur 6	Dur 11	Dur 16	Dur 21	Dur 26	Att.Age
25	0%	0%	0%	0%	0%	2%	50
30	0%	0%	0%	0%	0%	4%	55
35	0%	0%	0%	0%	2%	8%	60
40	0%	0%	0%	0%	6%	14%	65
45	0%	0%	0%	4%	12%	22%	70
50	0%	0%	2%	10%	19%	32%	75
55	0%	0%	8%	16%	28%	45%	80
60	0%	6%	13%	25%	43%	62%	85
65	0%	10%	25%	43%	62%	81%	90
70	0%	20%	40%	60%	80%	100%	95
75	0%	25%	50%	75%	100%	100%	100
80	0%	33%	67%	100%	100%	100%	105
85	0%	50%	100%	100%	100%	100%	110
90	0%	100%	100%	100%	100%	100%	115
95	0%	100%	100%	100%	100%	100%	120

# Summary

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- **New preferred study and tables ‘coming soon’**
- **A great deal of judgment is still required**
  - Lack of credible data in many places
  - Preferred experience limited to early durations
  - Many factors impact mortality results besides preferred classifications
- **Older age mortality grading back to population mortality**
- **Material differences in mortality results by policy size**
- **2001 VBT slope likely too steep at core ages**
- **Preferred underwriting results**
  - Differentials assumed to persist for younger issue ages
  - Material evidence that today’s preferred paradigm breaks down at older attained ages

# Questions?

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