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Older Age Mortality and Underwriting

Older Age Mortality

Iowa Actuary Club Annual Meeting
February 26, 2010

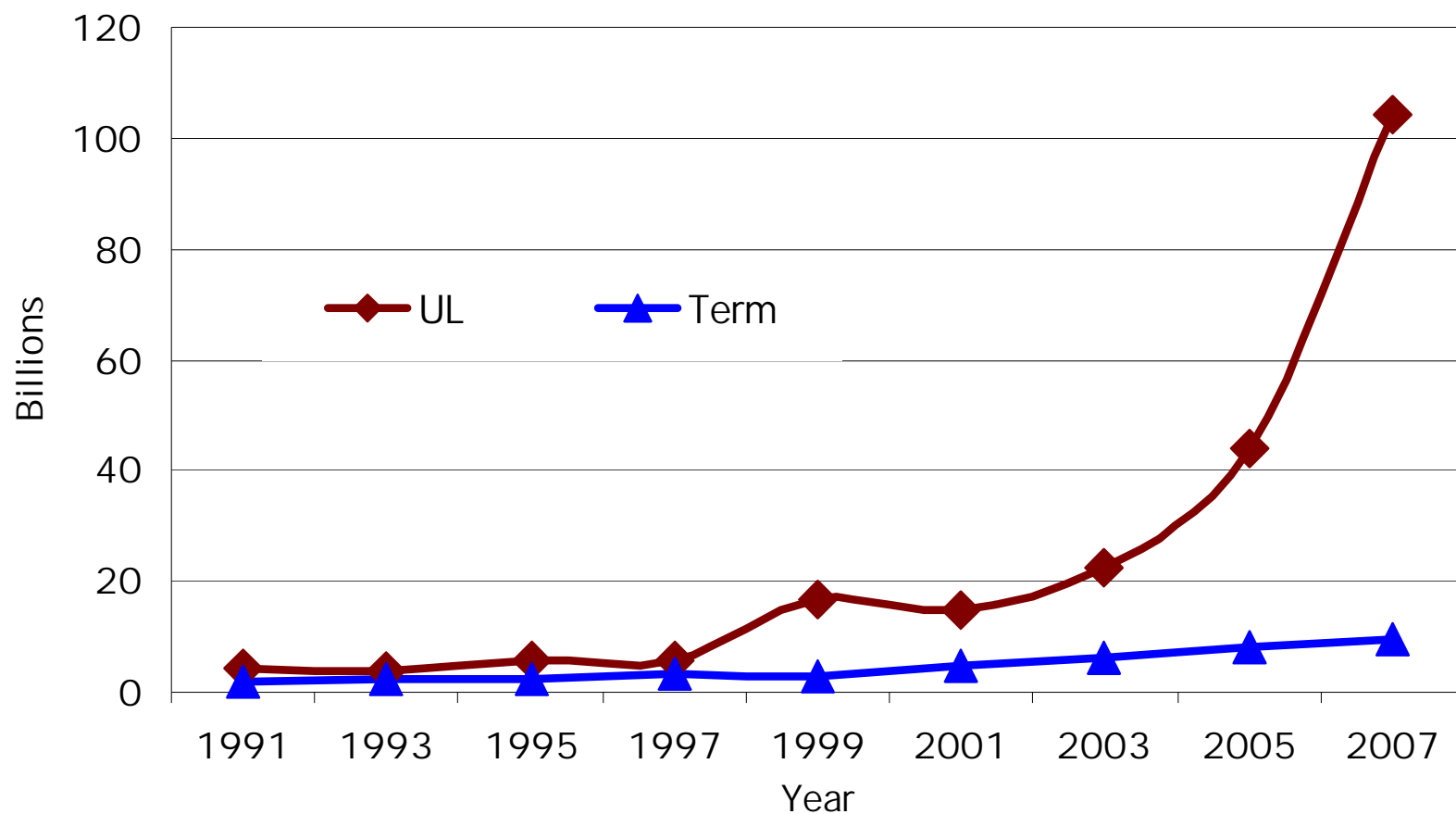
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UL Older Age Business

- I. Market Growth and Challenges
- II. Select Mortality Older Age Experience
- III. Older Age Assumption Setting
- IV. Conclusions

Growth in Older Age Market

U.S. Term and UL sales to individuals age 65+



Source: LIMRA

Challenge: Insurance Product Pricing

- Primary Market: Sampling of leading direct and reinsurance rates imply extraordinary future experience
- Secondary Market: The secondary market for life insurance policies will exploit product design guarantees (“soft spots”) and present additional lapse and mortality risk

Select Mortality Experience

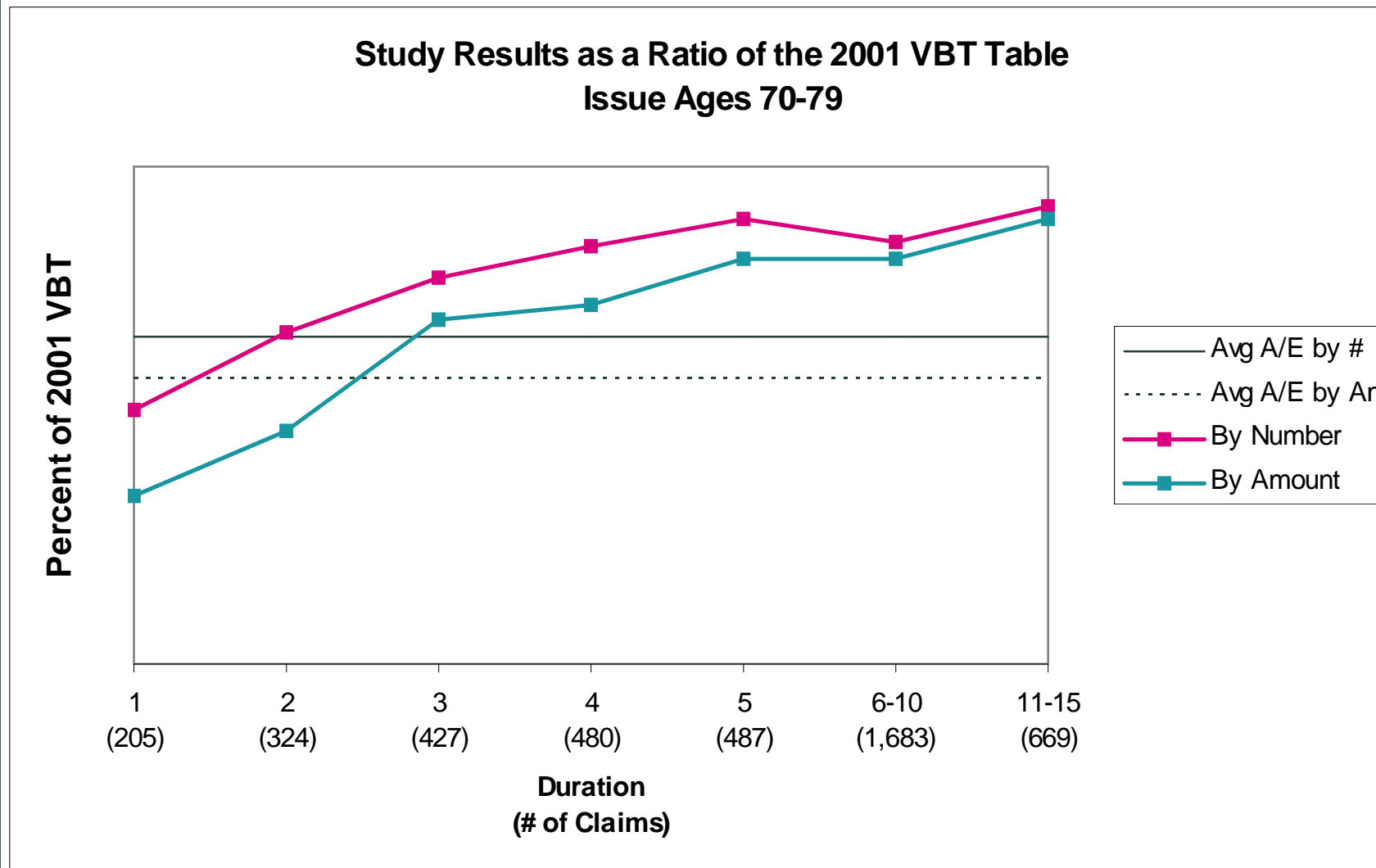
2008-2009 Swiss Re Industry Study

- 53 Companies
- Nearly 16.8 MM policies and over \$6.5 Trillion face amount
- Policies \$100,000+, capped at \$5 MM, standard issues
- 1990+ issues, but experience only for 2001+
- Over 63,500 claims - claims dampened so no company contributes more than \$1.2 Billion of claims (about 6.6%)
- Over 5,400 claims issue ages 70+
- Results indicate that the mortality slope is much steeper than the 2001 Valuation Basic Table at the older issue ages

Select Mortality Experience Data Results

2008-2009 Swiss Re Industry Study

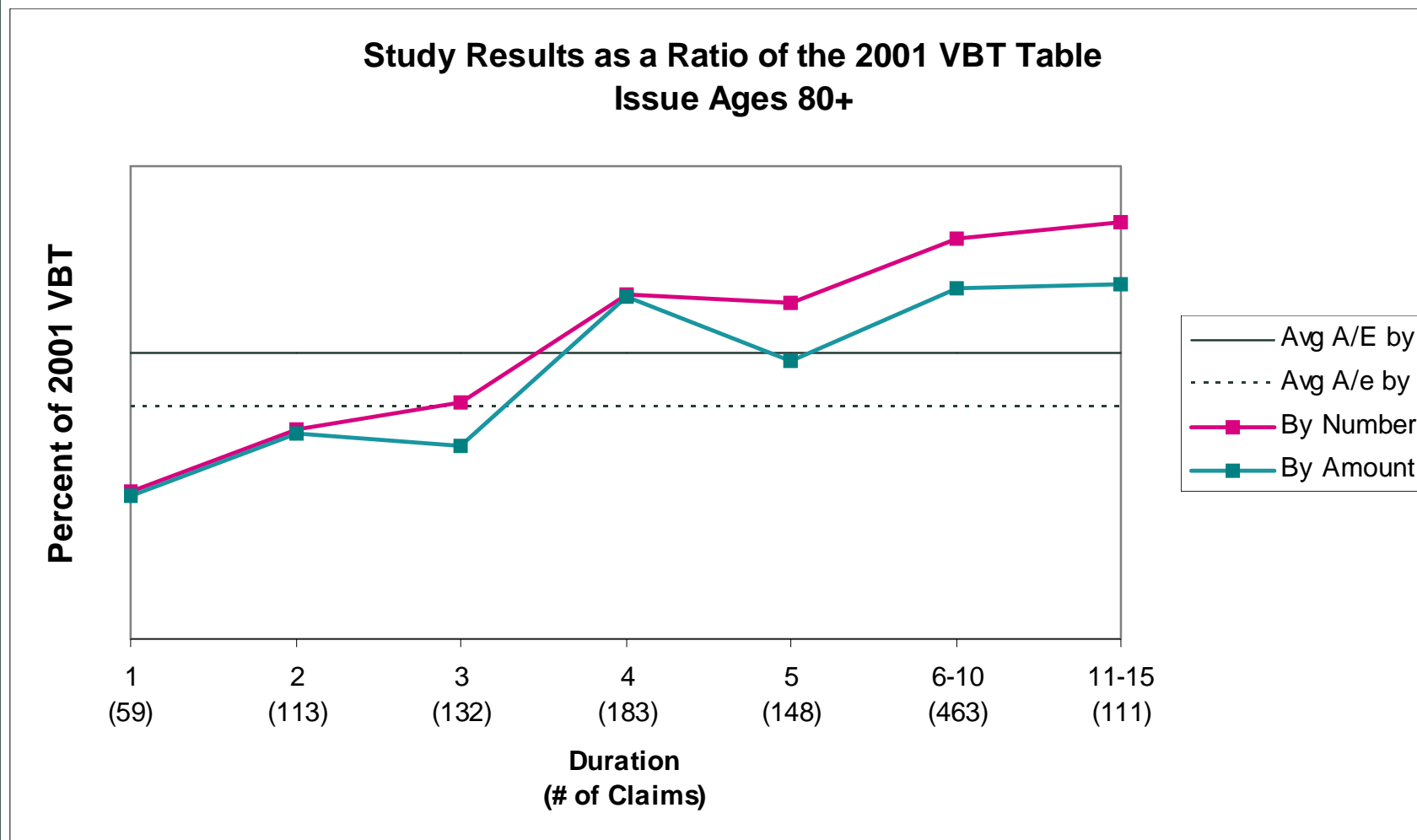
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Select Mortality Experience Data Results

2008-2009 Swiss Re Industry Study



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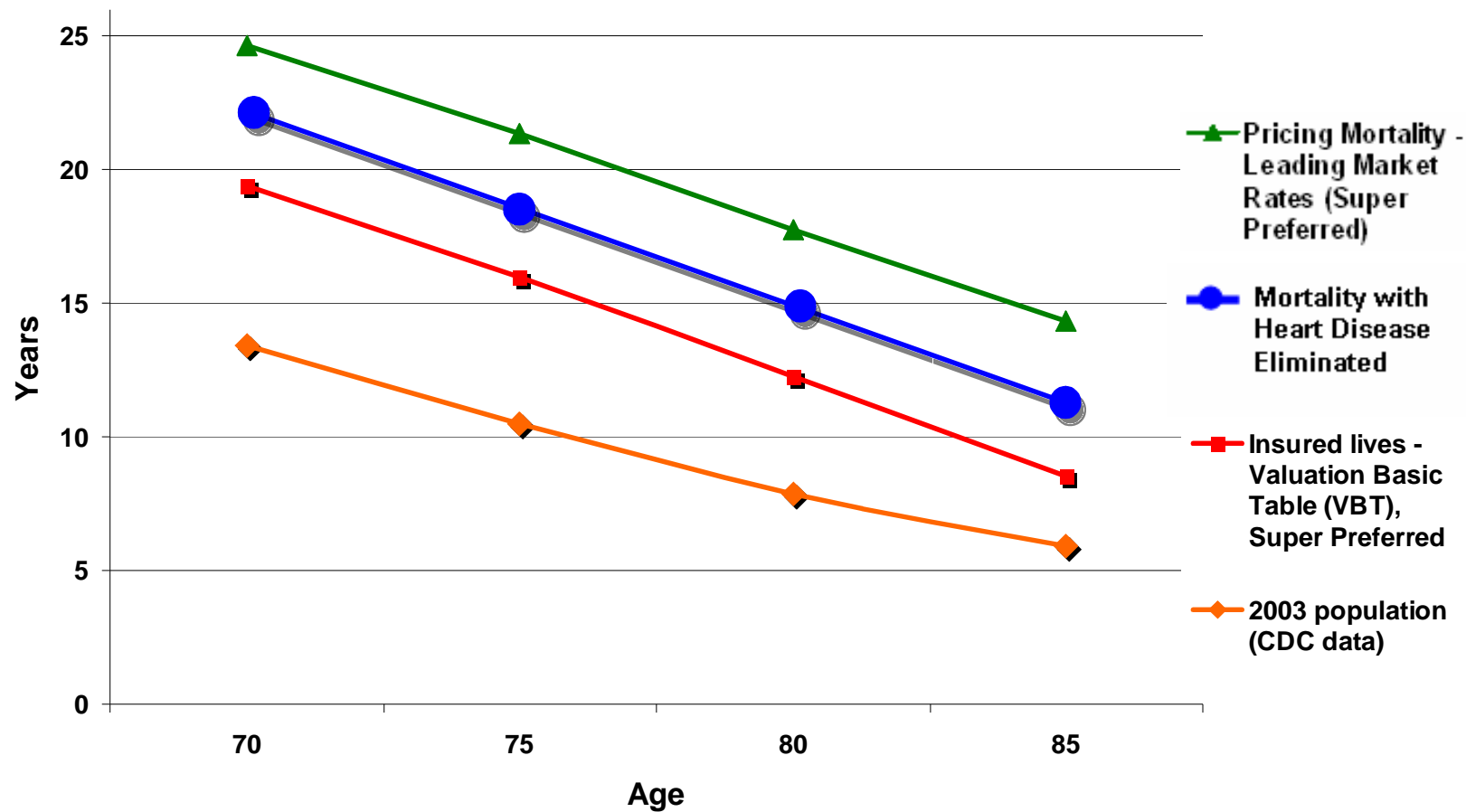
Older Age Assumption Setting

- Mortality
 - Insured experience is critical
 - Early duration mortality doesn't tell the whole story
 - Ultimate mortality grades to population mortality eventually
 - A flat percentage of a table is not realistic
 - Mortality improvement factors into the slope of your assumption
- Consider lapse experience on lapse supported products
 - Some lapse supported products have exhibited lapse rates < 1%
 - Examples include level COI products in Canada or level premium LTC products in US

Taking it a Step Further ...

Leading market rates indicate that heart disease, the number one cause of death, could be eliminated and inefficiencies would still exist!

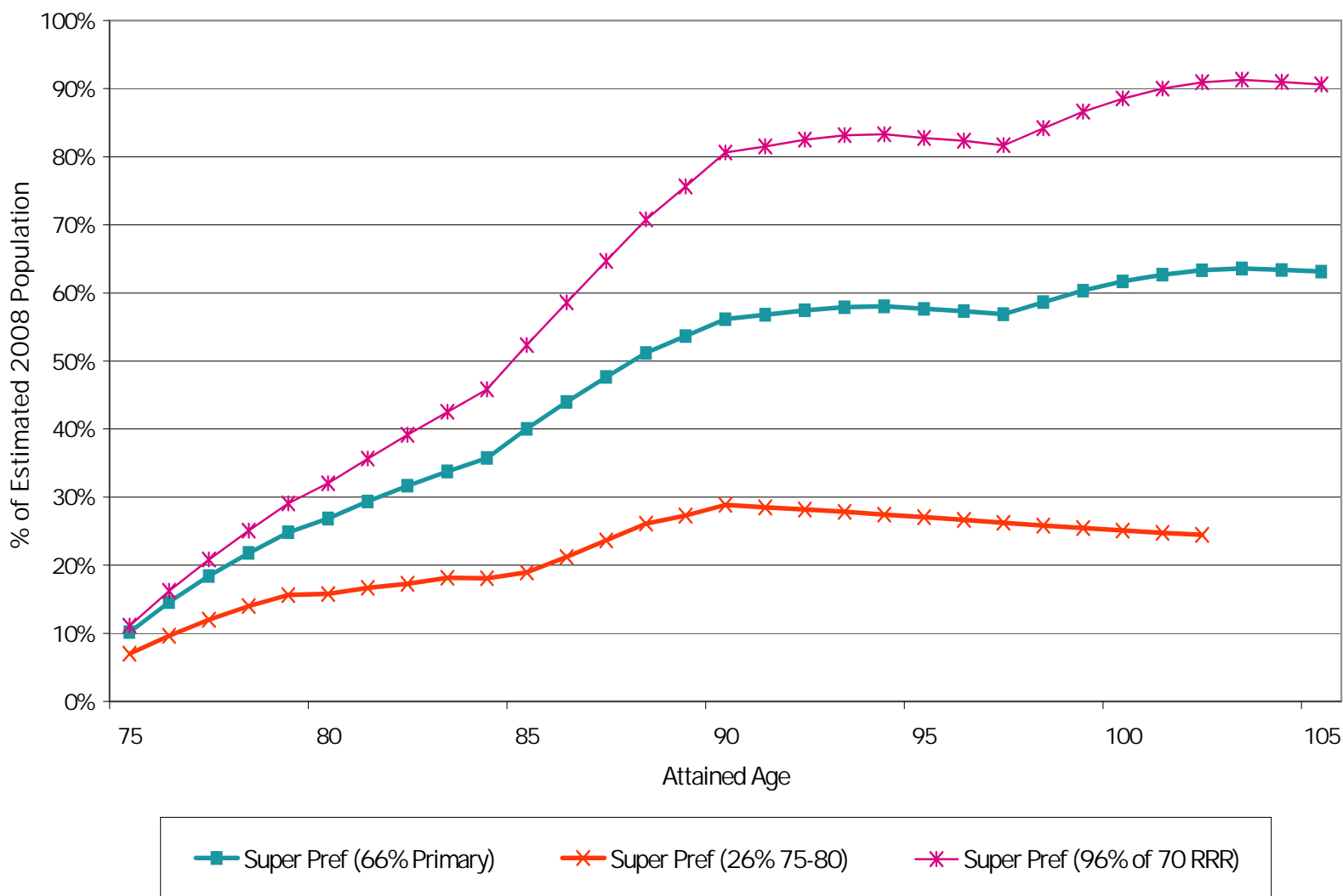
Male Life Expectancy



Industry Table Benchmarks

Are the leading market rates using a flat percentage of the 75/80 table?

2008 VBT Comparisons - Age 75



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UL Older Age Summary

■ Conclusions

- A disconnect between emerging older age experience and pricing mortality exists
- “Soft spots” will be exploited by the secondary market for life insurance policies
 - High guaranteed crediting rates
 - Aggressive substandard ratings

■ What can you do?

- Add Older issue age specific underwriting
 - Use existing tests and information
 - Use additional emerging older age tests and information
- **Monitor the business closely**

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Older Age Mortality and Underwriting



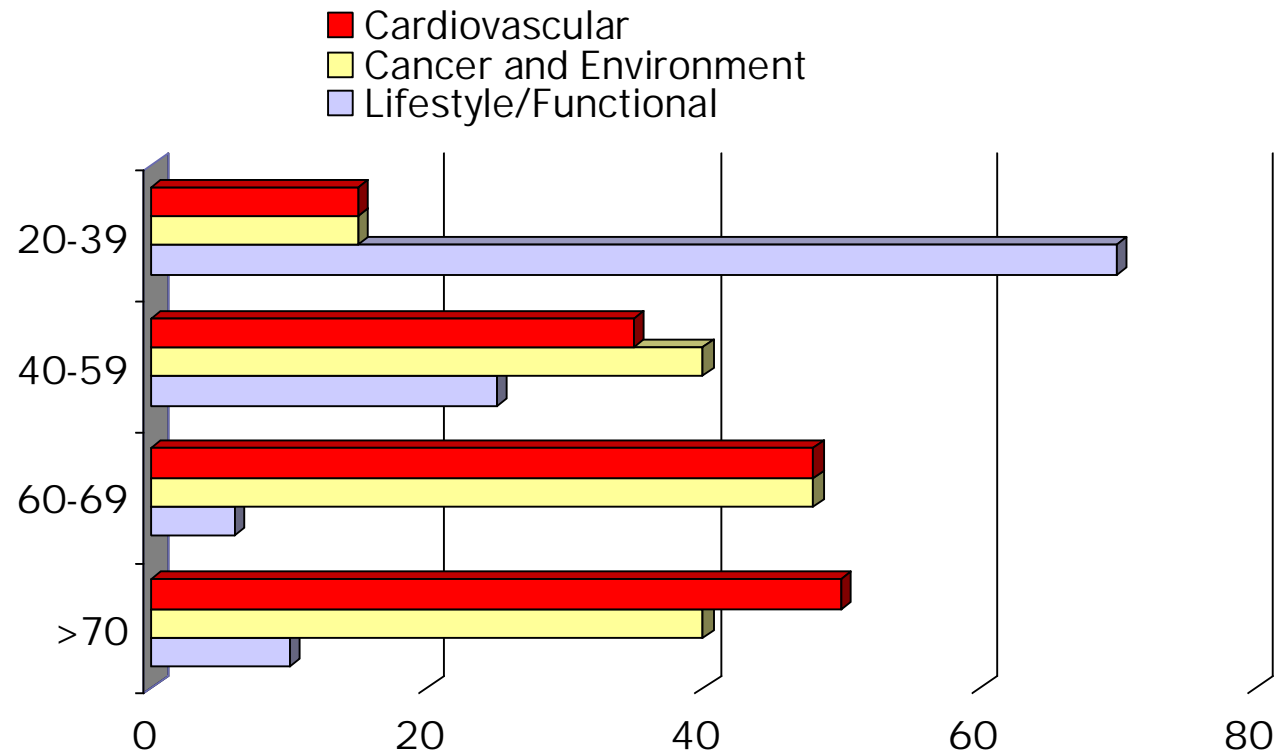
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Older Age Underwriting

- Challenges and concerns with underwriting older age applicants
- Underwriting trends
- Underwriting tools
- Financial underwriting
- LTC acceleration rider
 - Additional application questions and requirements

Challenges and Concerns Underwriting Older Age Applicants

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Age	Cause of Death (US 2003)
20-30	Accident, Suicide, Assaults
40-59	Heart disease, Cancer, Accidents
60-69	Cancer, Heart Disease, Lung disease
> 70	Cancer, Heart disease, Dementia

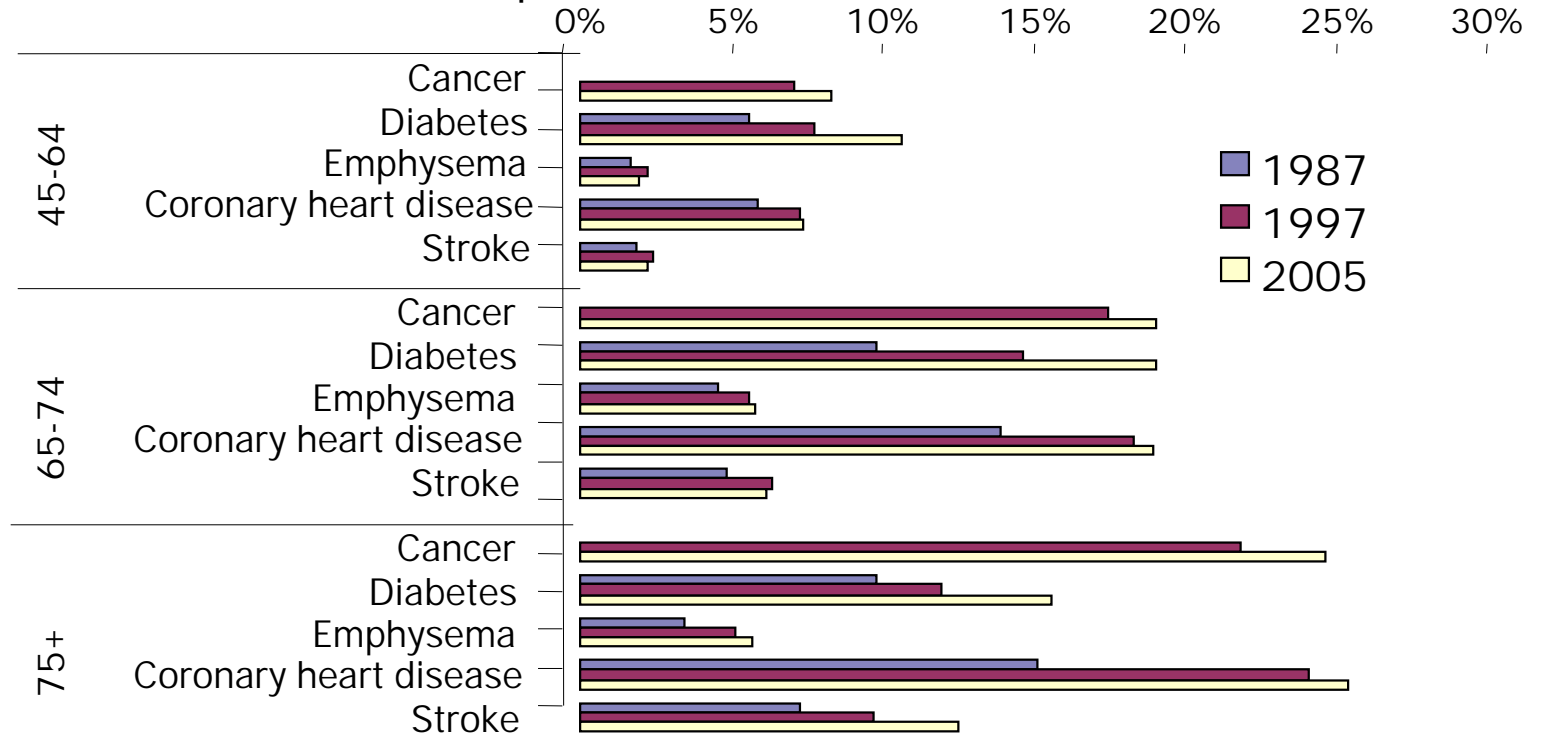
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Challenges and Concerns Underwriting Older Age Applicants

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The burden of chronic disease is on the rise in many age bands.

Trends in the prevalence of chronic disease over time



- Improved disease management combined with increased life expectancy has led to an increase in the age specific prevalence of disease over time.
- Underwriting tools are likely to yield more information of rating significance in this environment

National Health Interview Survey

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Challenges and Concerns Underwriting Older Age Applicants

Advances in medical
disease management
allow individuals to
survive with multiple
medical conditions.

Chronic disease prevalence by age group

# of chronic conditions	65-69	70-74	75-79	80-84	85+
0	25.7%	18.9%	15.2%	12.6%	12.2%
1	20.4%	18.0%	16.0%	14.9%	15.0%
2	22.2%	22.5%	21.6%	20.9%	21.0%
3	16.0%	18.7%	19.9%	20.4%	20.4%
4+	15.7%	21.9%	27.3%	31.2%	31.4%

- Morbidity burden in the elderly is substantially higher than in younger adults. This exposes insurers to an applicant population at greater risk of having overt or pre-symptomatic disease and premature mortality.
- Life insurance companies should consider these changes in the elderly population as they make decisions on underwriting requirements and the thresholds where requirements are obtained.

Underwriting Trends

Underwriting requirements are changing!

- 70 year old man looking for \$1,000,000

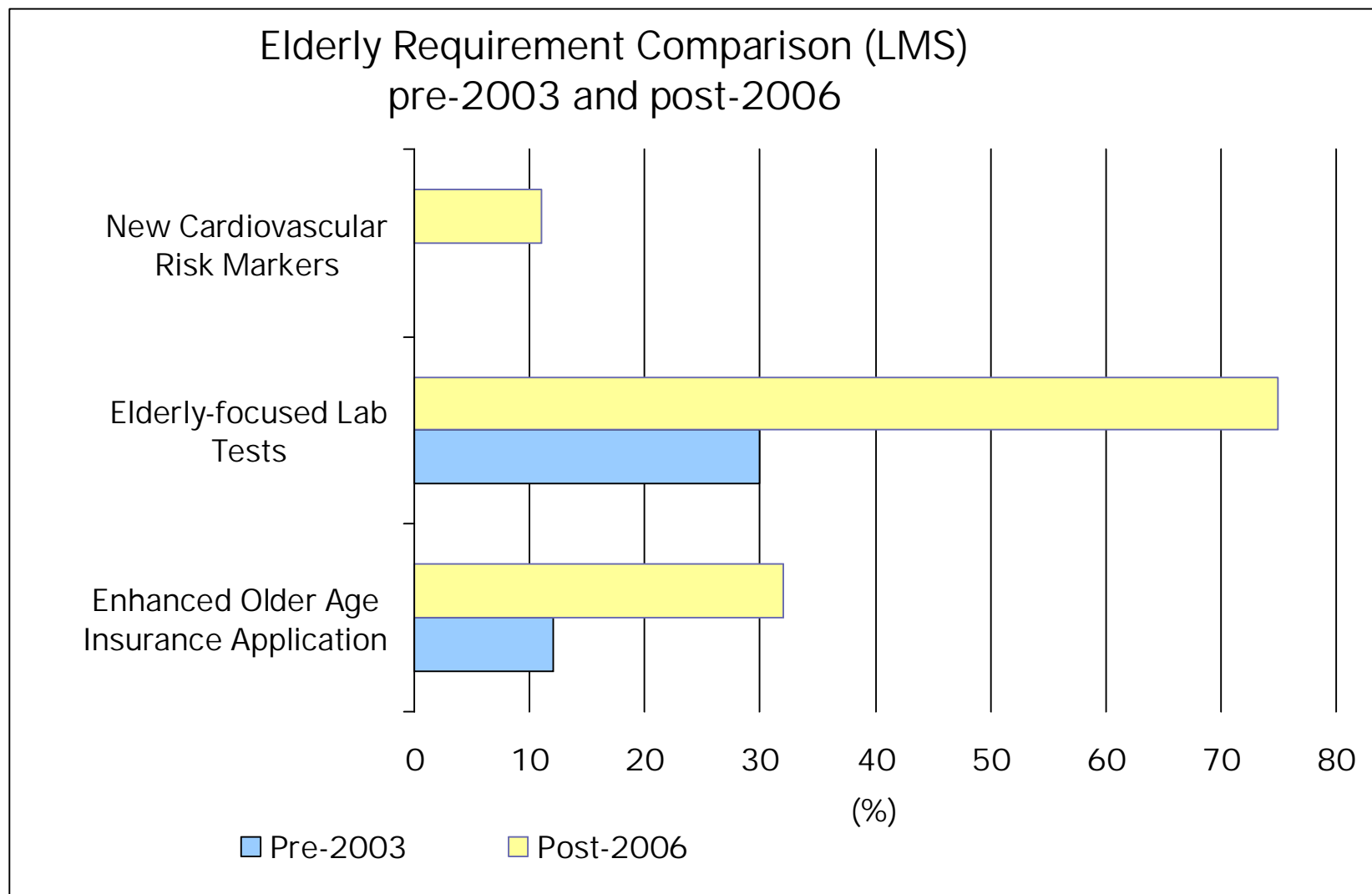
1988

- Medical examination by MD, HOS, TMEKG, IR, APS(s), financial statements

2008

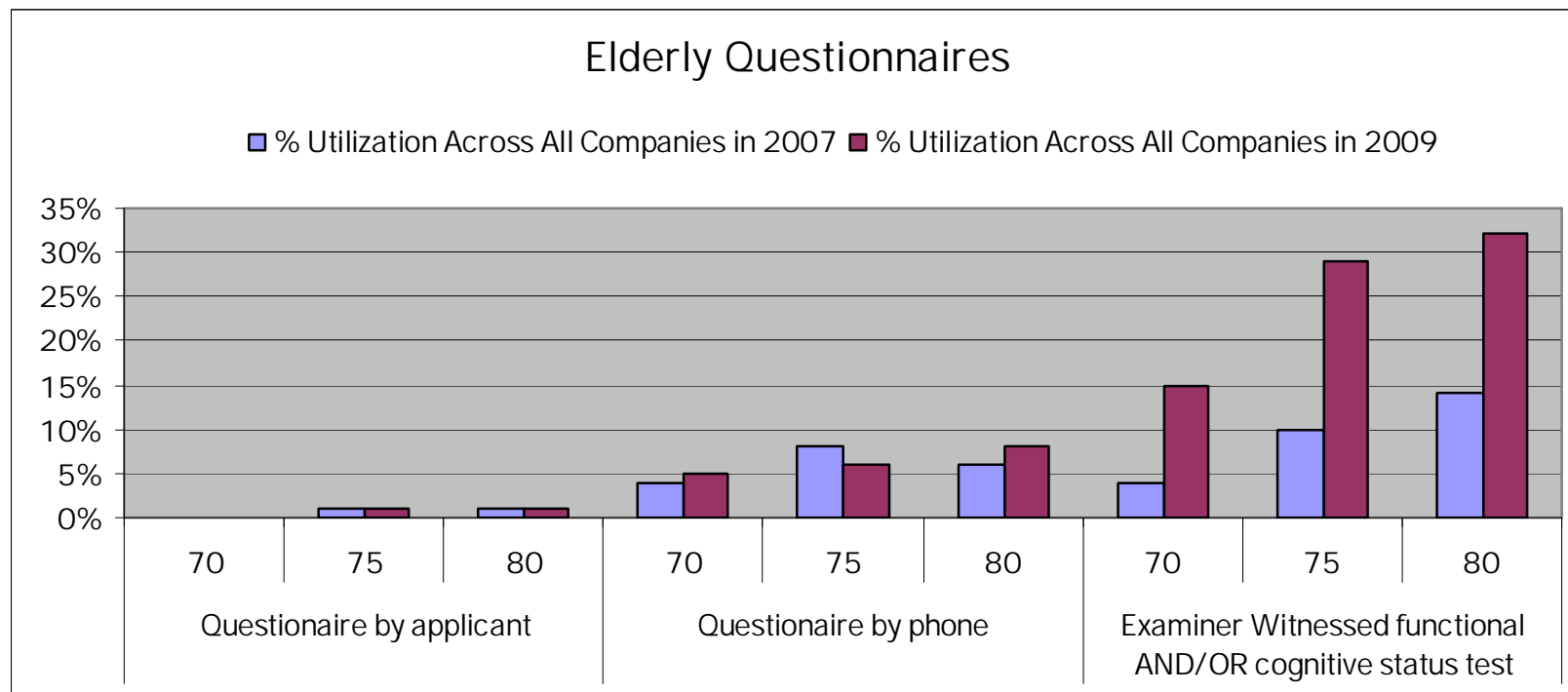
- Paramed exam, HOS with cocaine, blood with serologies, EKG, teleunderwriting data, MVR, PSA, prescription profile, APS (possibly), elderly testing results (cognitive, frailty), BNP, CRP, IR financial questionnaire, premium financing and life settlement triage tools

Underwriting Trends



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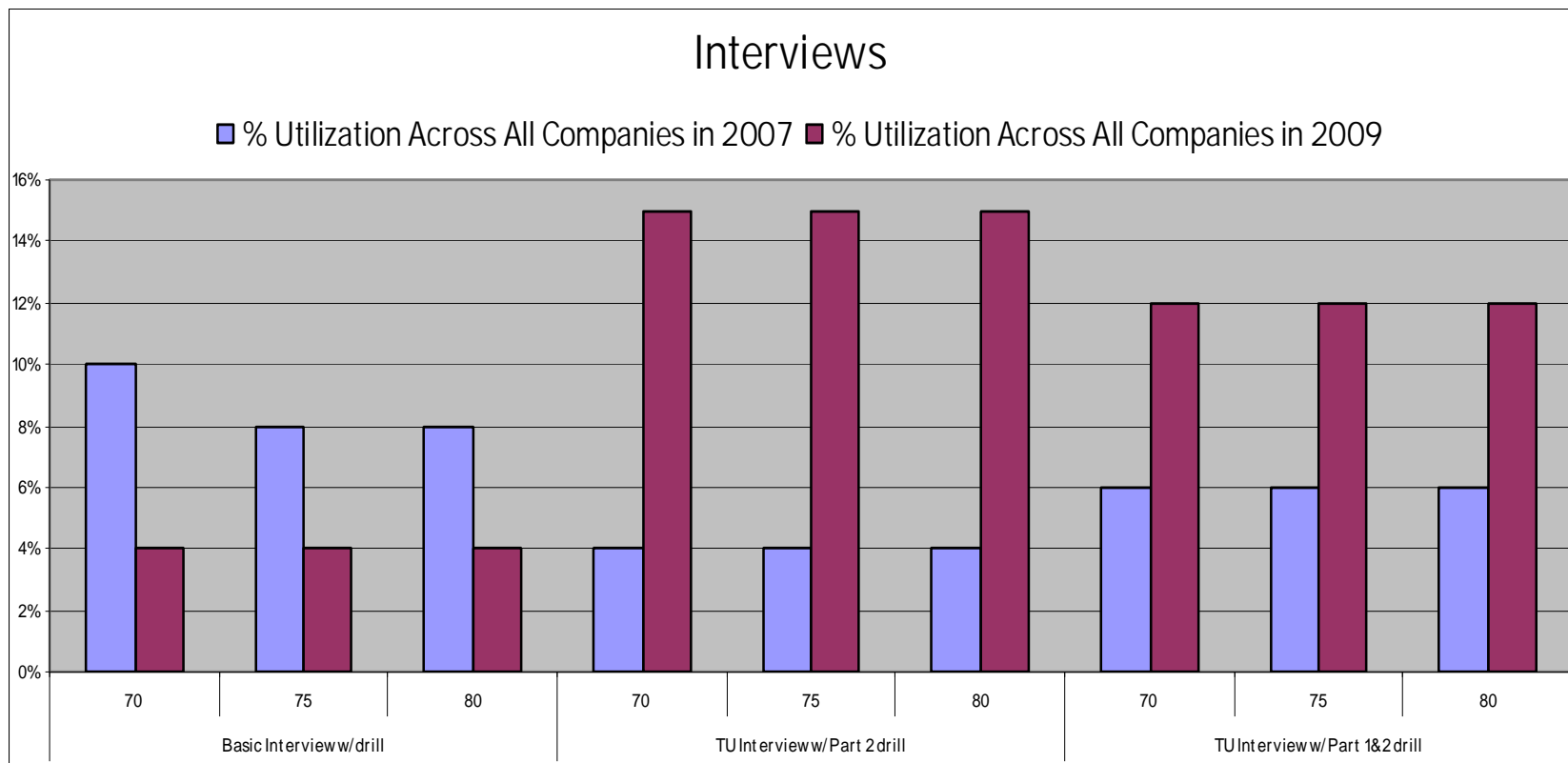
Underwriting Trends Multi-Company Study



Swiss Re Life Mortality System (LMS)

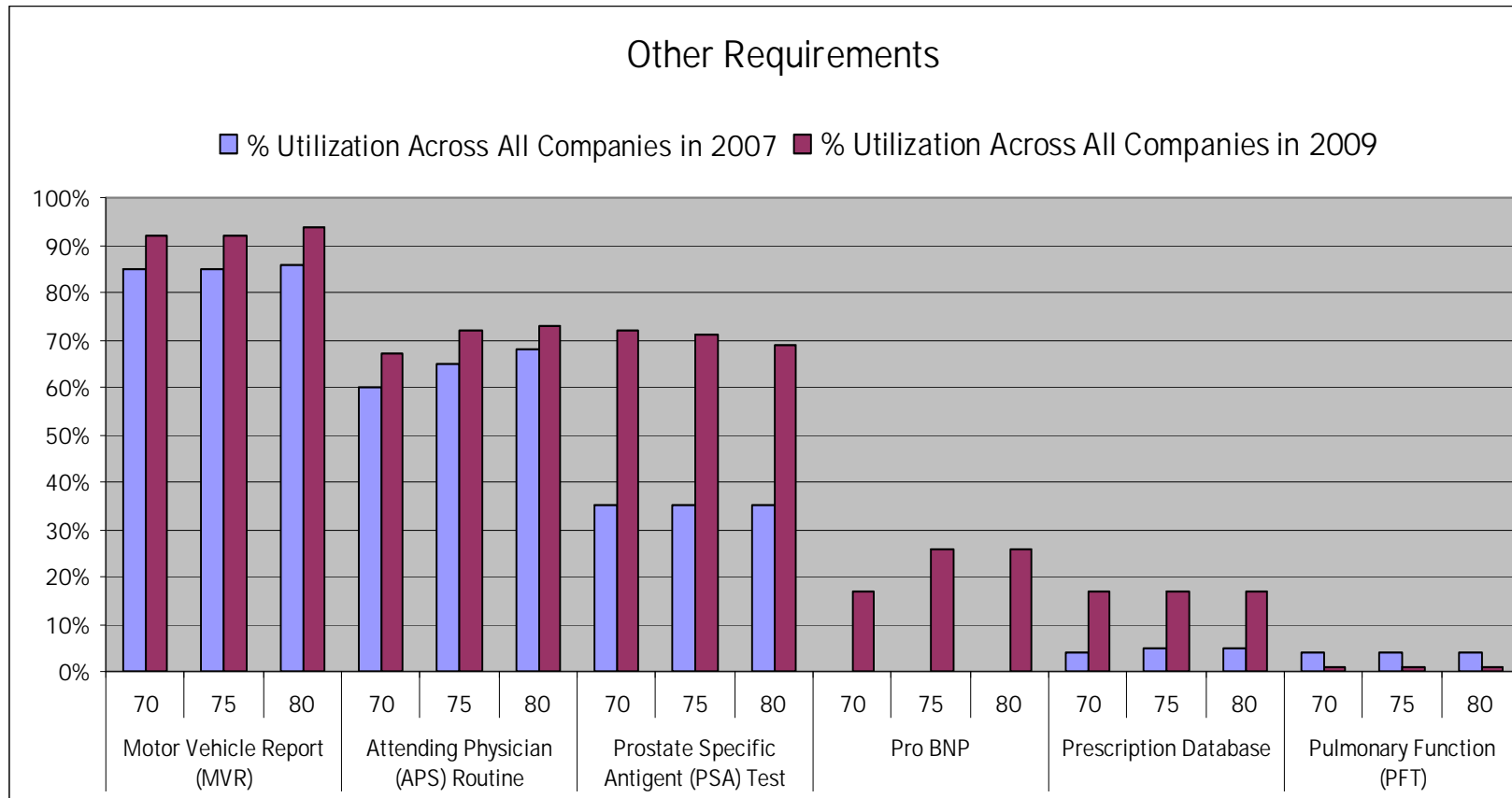
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Underwriting Trends Multi-Company Study



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Underwriting Trends Multi-Company Study



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Underwriting Tools

- Challenge to develop existing underwriting tools and implement new tools
 - APSs continue to be needed at older ages
 - Older Age exams, questionnaires and supplements
 - ADLs/IADLs
 - Cognitive testing
 - Functional and mobility testing
 - Social, support & life style questions
 - Frailty underwriting
 - Medical - laboratory tests
 - Prescription database
 - Financial underwriting

Underwriting Tools - Older Age Exams, Questionnaires & Supplements

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■ Special Exams/Tests

Ask the right questions

- Ask about assisted devices: walker, wheelchair, cane, etc
- Ask about ADLs and IADLS
- Ask about falls: how many and when
- Ask about living arrangements: with who and where
- Ask about driving: if stopped, when and why
- Ask about work, volunteering, travel, hobbies, social activities
- Ask about mental attitude and exercise

Underwriting Tools - Older Age Exams, Questionnaires & Supplements

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■ Life style functioning

Aging and Exercise	
Exercise Intensity	Mortality reduction
Once weekly (golf or walks)	23%
2 - 4 times weekly	30%
>4 times weekly	38%
Vigorous exercise	43%

42,000 women aged 55 to 69 followed for 7 years Kushi JAMA 1997

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Underwriting Tools - Older Age Exams, Questionnaires & Supplements

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Perform Special Tests

- Assess mobility
 - Get up and Go test
 - Chair rise
 - Balance and gait

Underwriting Tools - Older Age Exams, Questionnaires & Supplements

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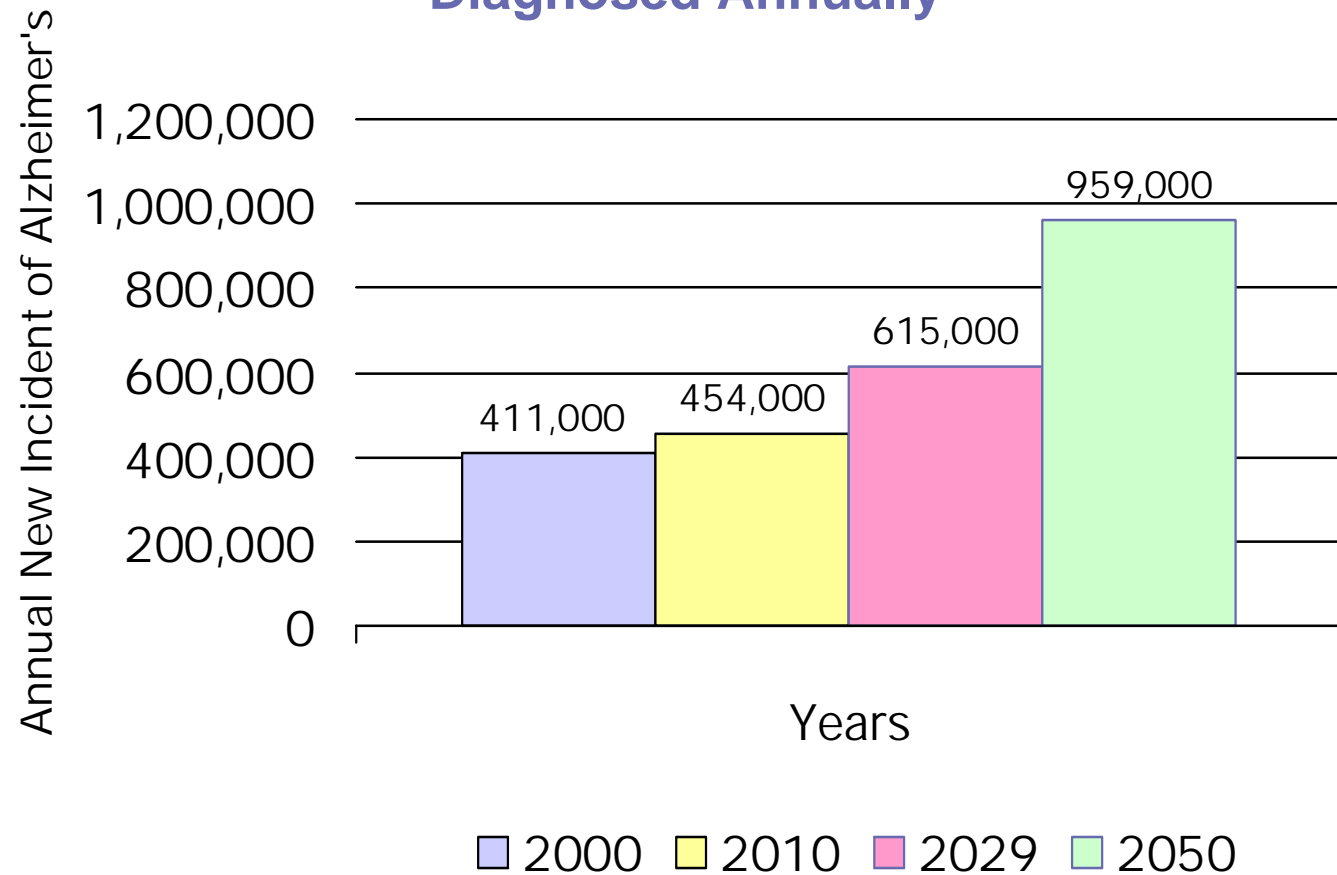
Perform Special Tests

- Assess cognition
 - Delayed Word Recall (DWR)
 - Clock drawing test (CDT)
 - Mini Mental State Exam (MMSE)
 - Minnesota Cognitive Acuity Screen (MCAS)
 - Enhanced Mental Skills Test (EMST)

Underwriting Tools - Older Age Exams, Questionnaires & Supplements

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Estimated New Cases of Alzheimer's Disease Diagnosed Annually



2009 Alzheimer's Disease Facts and Figures

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Underwriting Tools – APS and Cognitive screening

- Case: Female age 72 applying for \$1 million of life insurance in December 2008
 - The APS reveals in 2005 she is diagnosed with mild COPD. Complains of short-term memory problems, spouse confirms. Physician diagnoses mild cognitive impairment and prescribes cross-word puzzles
 - In August 2008, she complains about memory issues, depressive symptoms, confusion and spouse has become increasingly more frustrated with her
 - Mini-mental status exam (MMSE) shows 28/30 (pass), but she is unable to recall any of the words in the 3-word DWR test
 - Neuropsychological and brain imaging tests were completed in November 2008 which she is diagnosed with mild – moderate dementia
- What if she applied for insurance in July 2008? Would your company issue a policy?

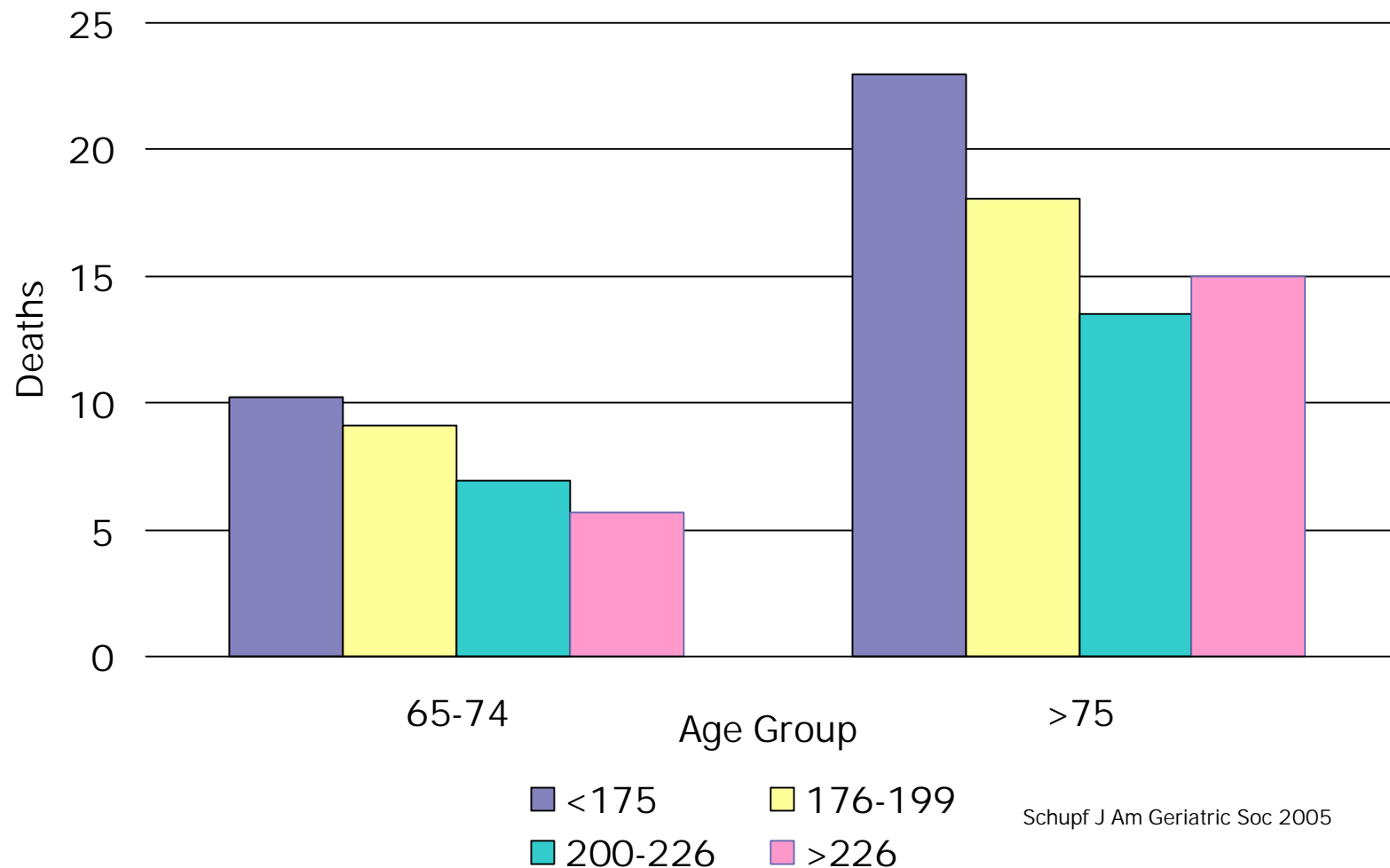
Underwriting Tools - Medical Tests

- Current tools – Blood profile
 - Albumin – low albumin predictor of mortality
 - Liver function testing
 - Kidney function (future: Cystatin C)
 - Cholesterol screening
 - C-reactive protein & ProBNP

- Physical Examinations
 - Normal to slightly higher BMI
 - Underweight and unintentional weight loss more likely to be associated with significant disease and increased mortality
 - Blood pressure
 - Resting and exercise ECGs

Underwriting Tools - Medical Tests – Cholesterol screening

Plasma lipids and mortality by age group

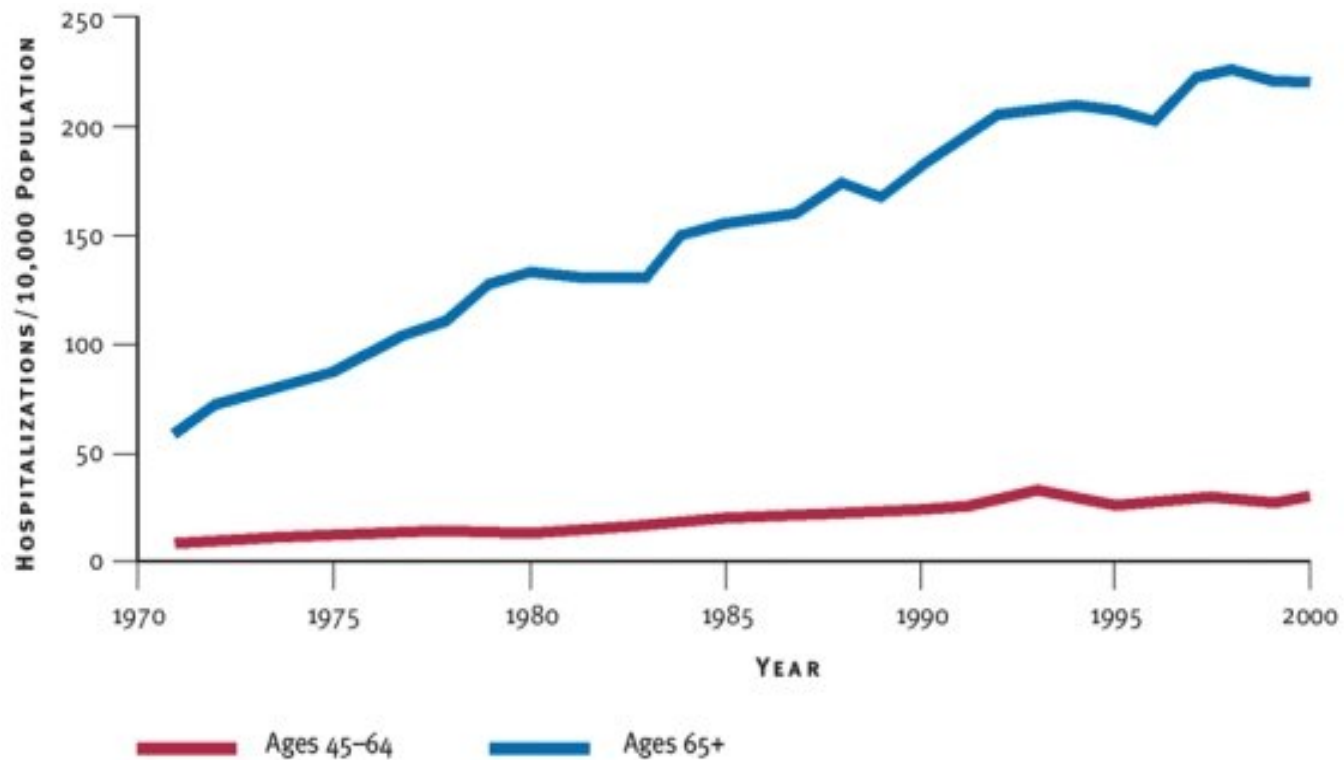


Schupf J Am Geriatric Soc 2005

Underwriting Tools - Medical Tests – NT-proBNP

- CAD-related impairments represent most of the heart failure cases that we will see. BNP helpful in ruling in/out heart failure.

US data: Heart failure prevalence increasing in the elderly (NCBI)



Underwriting Tools

Exercise ECG test

- Increased exercise and aerobic capacity is associated with improved survival
- Treadmill tests also helps to evaluate frailty – gait and balance
- Evaluates the individual's ability to follow directions (cognitive functioning)
- An important predictor of not only cardiovascular risk and frailty, but a good all cause mortality predictor
- A treadmill exercise test is an excellent way to test overall function muscle strength, muscle power, pulmonary and cardiovascular fitness
- Multiple studies have shown that if work capacity is < 5 METs, a major impairment of cardiac reserve is suggestive

Benefits of prescription database

- Polypharmacy definition: Use of 5 or more medications for management of chronic conditions
 - Key risk factor: multiple diagnoses/problems
- Can identify multiple chronic illnesses and medications not disclosed on the application or examination
- Provides confirmation of physicians treating the proposed insured
- Assists in understanding the proposed insured's knowledge or lack of knowledge about one's medications and medical conditions
- Provides additional physician information not disclosed
- Identify multiple prescribers of medications such as pain medications

Underwriting Tools - Frailty Screening

- Frailty is considered when 3 of the 5 following are present:
 - Unintentional weight loss (5% of wt loss in previous 1 yr or BMI <19)
 - Muscle weakness (grip strength or leg strength)
 - Slow walking speed
 - Low physical activity
 - Exhaustion (self-reported)

3 Year Survival	
Not frail	97%
Intermediate	93%
Frail	81%

Fried, Tangen, Walston, Newman, Tracy, et al, J Ger Med Sci, 2001

Underwriting Tools - Frailty Screening

- Musculoskeletal frailty – physical function
 - Exercise capacity, Gait, Falls, ADLs, IADLs, driving
- Neurologic - cognitive function
 - Testing for cognition? Complaints from family? Personal complaints?
- Immunology frailty – cancer testing, infections
- Social engagement
- Bereavement issues
- Tools needed – APS, Older age exam and questionnaires, functional & cognitive screening, laboratory tests, ECG & stress tests, MVR

Underwriting Trends for Older Age Applicants 70+

Favorable older age applicants

- Smoking last 10 years?
- A family history of longevity (both parents age 75+)
- A short list of well controlled relatively minor disease(s)
- Well nourished with slightly above average weight. No weight loss
- Labs: Cholesterol under 300, ratio under 6.5. No low cholesterol
No low albumin, PSA under 6.0, normal BNP, normal PFTs.
- No evidence mental illness, alcohol or drug overuse
No history of falls. Strong AP care with routine screening.
- Normal cognitive testing and evidence of physical fitness
- Socially active with good coping skills
- No moving violations or accidents
- Strong financial need

Older Age Underwriting – Financial underwriting

Over age 70 – Different motive

- Investment driven – purchased for death benefit
- Increasingly children or third party owners/beneficiary
- Purpose
 - Estate taxes
 - Burial expenses
 - Liquidity
 - Asset transfer and protection
- Total line of coverage
- Premium amount – reasonable?

Older Age Underwriting – Financial underwriting tools

- Case development & underwriting requirements
- Telephone interviews with drill downs and inspection reports
 - Premium financing questions
 - Life settlement questions
- Financial questionnaires
- Financial and income tax statements
- Bank account information
- Trust details
- Credit report

Older Age Underwriting – Long-Term Care Acceleration Rider

- Additional questions on the application or Older age supplement
 - Assisted devices: walker, wheelchair, cane, etc
 - ADLs and IADLS
 - Long-term care facility
 - Mobility - Falls: how many and when?
 - Questions regarding memory loss, MCI, organic brain disorder
 - Expanded questions regarding arthritis, nervous disorders, abnormal chest x-rays
- Underwriting requirements
 - APS, senior exams, phone or face-to-face interviews, cognitive tests, functional tests, prescription database checks

Older Age Underwriting – Conclusion

- The elderly insurance applicant presents a unique challenge - high prevalence of chronic disease
- Underwriting includes evaluating chronic diseases, cognitive and physical functioning, frailty, social engagement and good coping skills
- New underwriting requirements may have a positive effect on mortality results
- Trading one underwriting requirement for an older age requirement should be reviewed cautiously
- Financial underwriting to identify and avoid stranger owned life insurance plans is needed
- LTC riders need to be underwritten with the probability a claim could occur – ask additional questions

Older Age Underwriting Acknowledgements

- Swiss Re NA Medical Department
- Swiss Re NA Underwriting Department
- Swiss Re NA Applied Research & Development

Questions



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