

Update on Development of New Mortality Tables

Society of Actuaries & American Academy of Actuaries Joint Project Oversight Group

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Guaranteed Issue/Simplified Issue Mortality Update

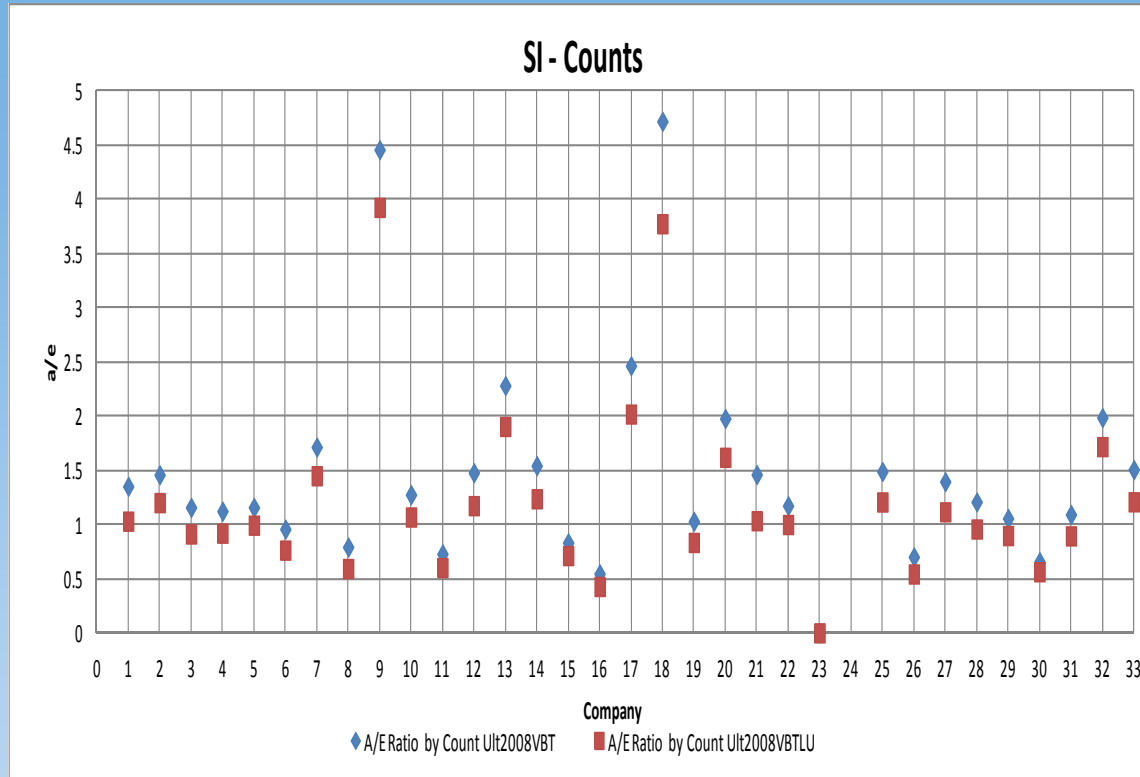
Current Status

- Received: 36 submissions
 - GI: 15 companies, 6.4 million policy years
 - SI: 33 companies, 21.9 million policy years
 - Preneed: 12 companies, 10.0 million policy years
 - Most companies submitted 5 calendar years of data (4 policy years)
- Data cleansing for SI mostly complete; one or two re-submissions still expected
- Analysis expected to begin for SI mid- to late March; others to follow in April
- Persistency analysis expected to begin late 2nd quarter
- Aggressively targeting first draft of mortality tables late 2012

Current Status

- Data dominance
 - Not seeing in aggregate for SI
 - Slight company dominance for GI and pre-need though still analyzing
 - May need to limit exposures from some companies
 - Is an issue as try to refine analysis to distribution channel / marketing type / applicant type
 - Still determining what analysis is possible

Preliminary Experience Results - SI



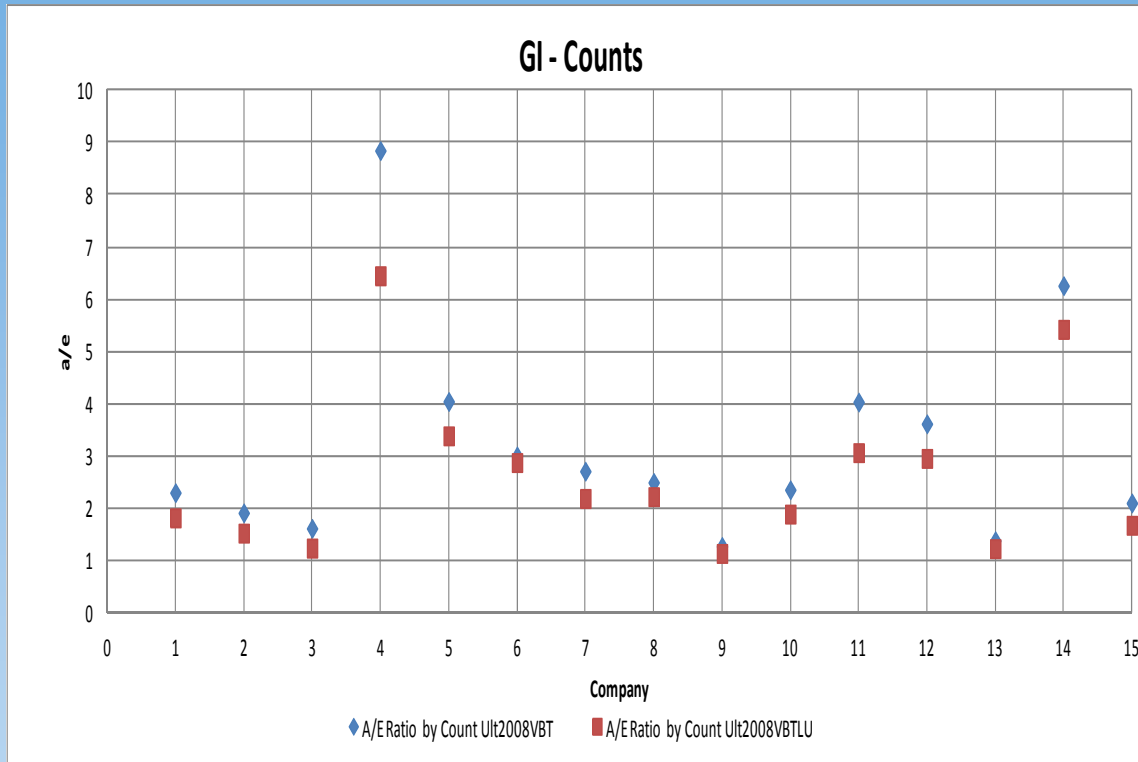
Company 33 above is aggregate result, one company's data not yet included.

Source: Society of Actuaries from MIB database for GI/SI Mortality Table Task Force

Expected Basis	Raw A/E % - Preliminary*	
	By Count	By Unit
2008 VBT		
S&U	245%	250%
S&U LU	185%	160%
Ultimate	160%	135%
Ultimate LU	130%	119%

* Overall A/E, over all contributors but after removing the gross outliers

Preliminary Experience Results - GI



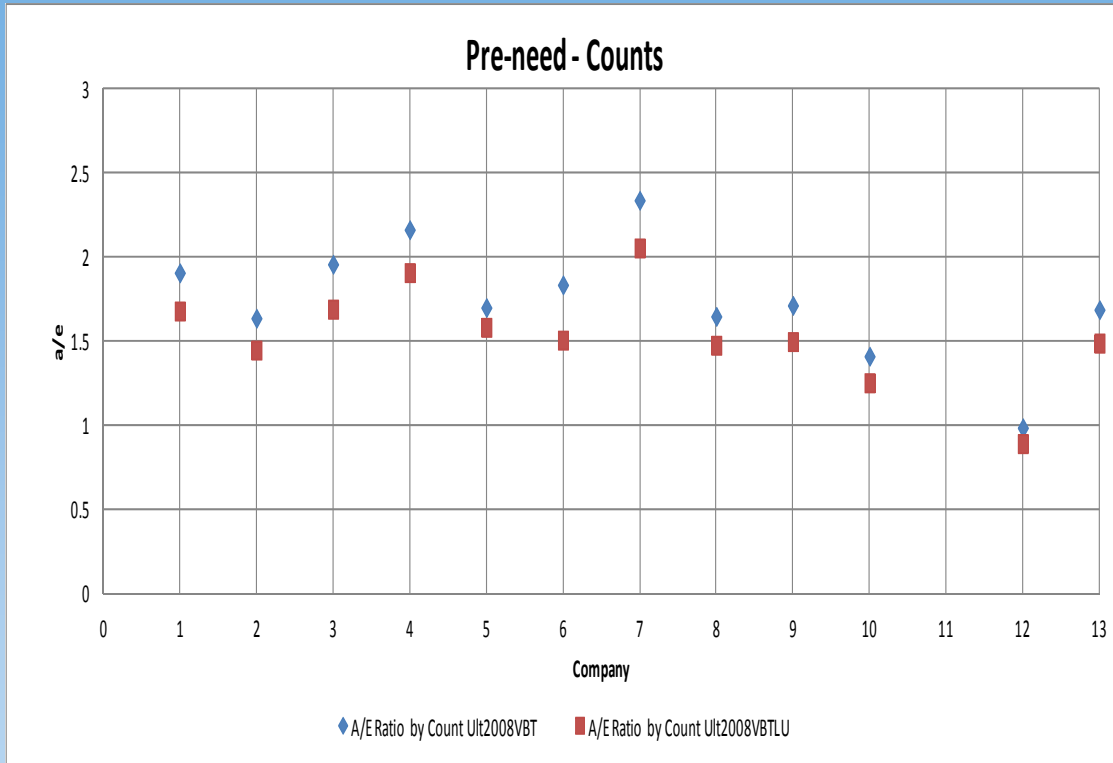
Company 15 above is aggregate result, one company's data not yet included.

Source: Society of Actuaries from MIB database for GI/SI Mortality Table Task Force

Expected Basis	Raw A/E % - Preliminary*	
	By Count	By Unit
2008 VBT	By Count	By Unit
S&U	340%	305% - 515%
S&U LU	250%	220% - 335%
Ultimate	210%	185% - 250%
Ultimate LU	165%	145% - 200%

* Overall A/E, over all contributors but after removing the gross outliers

Preliminary Experience Results – Pre-need



Company 13 above is aggregate result.

Source: Society of Actuaries from MIB database for GI/SI Mortality Table Task Force

Expected Basis	Raw A/E % - Preliminary*	
2008 VBT	By Count	By Unit
S&U	240%	260%
S&U LU	200%	215%
Ultimate	170%	175%
Ultimate LU	150%	155%

* Overall A/E, over all contributors but after removing the gross outliers

2014 VBT / CSO

Current Status

- VBT committee progressing with analysis of the 2002-2009 experience data
 - Have added data from 2007-2009 data call – still analyzing
- Preliminary analysis complete for:
 - Select period
 - Mortality improvement
 - Graduation approach
- Analysis on underwriting criteria scoring / preferred criteria not expected to be completed until mid 2012

Current Status

- Table structure
 - Focusing on aggregate table first, preferred tables will follow
 - To date, have not excluded any data but still examining
 - Potential issue with under-reporting of claims at lower face amounts at oldest issue ages – escheatment work may change outlook for older age claims
 - No terminal age
 - Will have for respective CSO tables = 121
 - Need for limited underwriting table still under examination
 - Relies partially on results from GI/SI study

Current Status – Select Period

- 2 phases
 - Observable select period
 - Prospective select period
- Observable select period
 - Based on underlying data of both common companies as well as all companies
 - Data analyzed based on count rather than amount to remove influence of variations/fluctuations by size of claim
 - Attempted to normalize the socio-economic impact over time
 - Focused on gender/smoking status level, quinquennial age groupings
 - Used GAM (Generalized Additive Model) to test fit of actual mortality to mortality predicted by the GAM model by duration as ratios to ultimate mortality, averaged across all attained ages

Current Status – Select Period, cont'd

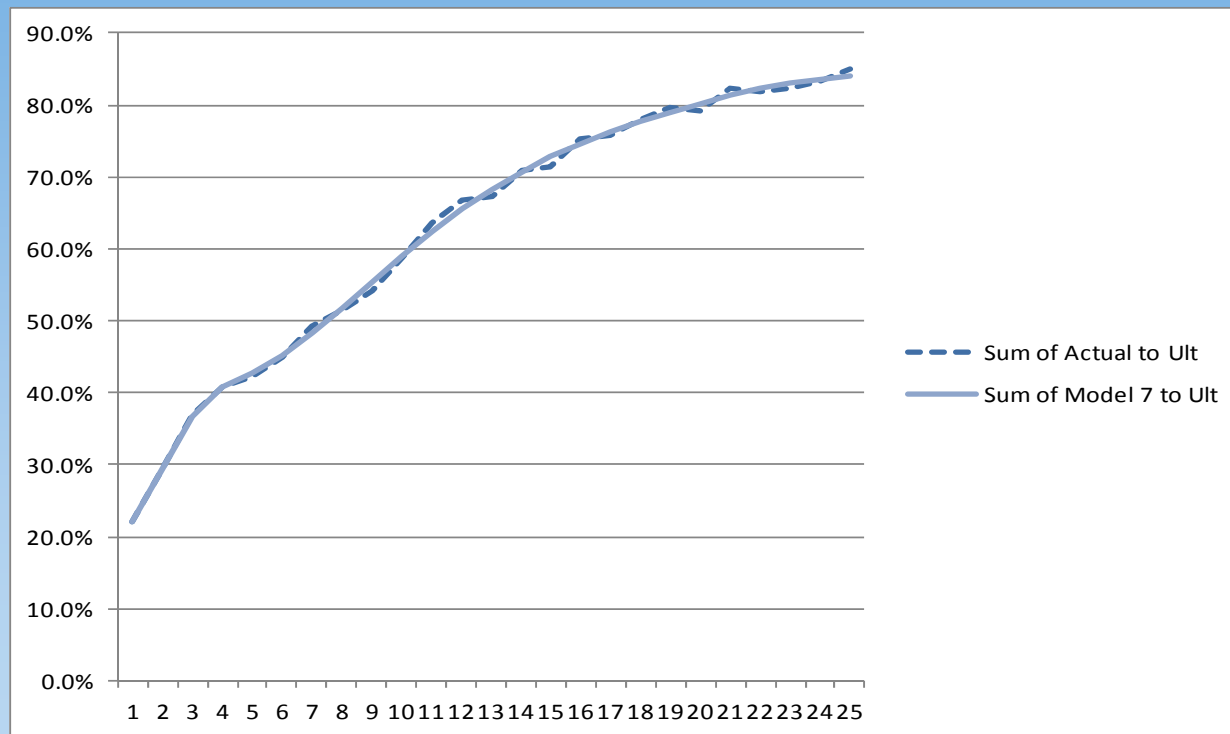
Initial Proposed Select Period Based on Observable Data

Issue Age	MNT	FNT	MT	FT	Issue Age	MNT	FNT	MT	FT
0-16	25	25	N/A	N/A	79	20	20	11	11
17-50	25	25	20	20	80	20	20	10	10
51	25	25	19	19	81	19	19	10	10
52	25	25	18	18	82	18	18	10	10
53	25	25	17	17	83	17	17	10	10
54	25	25	16	16	84	16	16	10	10
55	25	25	15	15	85	15	15	10	10
56	24	24	15	15	86	14	14	9	9
57	23	23	15	15	87	13	13	8	8
58	22	22	15	15	88	12	12	7	7
59	21	21	15	15	89	11	11	6	6
60	20	20	15	15	90	10	10	5	5
61-75	20	20	15	15	91	8	8	4	4
76	20	20	14	14	92	6	6	3	3
77	20	20	13	13	93	4	4	2	2
78	20	20	12	12	94+	2	2	2	2

Source: 2014 Valuation Basic Table Team of the Society of Actuaries & American Academy of Actuaries Joint Project Oversight Group

Current Status – Select Period, cont'd

Fit using GAM Model, Aggregate across all ages, Male, Non-smoker



Source: 2014 Valuation Basic Table Team of the Society of Actuaries & American Academy of Actuaries Joint Project Oversight Group

Current Status – Select Period, cont'd

- Prospective select period
 - Looking to “events” or changes in underwriting which have impacted the select period in the underlying 2002-2009 data
 - E.g., Movement from smoker to non-smoker rates (1980's), movement from non-smoker/smoker to non-tobacco/tobacco distinction (1990's), liberal underwriting period with increased level of underwriting exceptions (2000-2005), development of mature age underwriting requirements such as cognitive function (2005-present)
 - Most “events” will shorten select period from that in observed data; a couple such as NT versus NS and older age cognitive function testing may elongate

Current Status – Mortality Improvement

- Considerations

- General population improvement

- US Vital Statistics
 - Human Mortality Data Base (HMD)
 - Social Security Administration Data (SSA)

After looking at 3 sources, SSA data selected as source for general population

- Insured data

- Common company data for period 2002-2007
 - Given short period of time for historical experience and volatility from year over year, believe general population data is preferable

- Additional factors

Current Status – Mortality Improvement, cont'd

- Additional factors considered
 - Gender
 - Attained age
 - Smoker status
 - Socio-economic status
 - Differences in cause of death for insured lives vs general population
- Still need to revisit using 2002-2009 data to ensure recommendations still valid

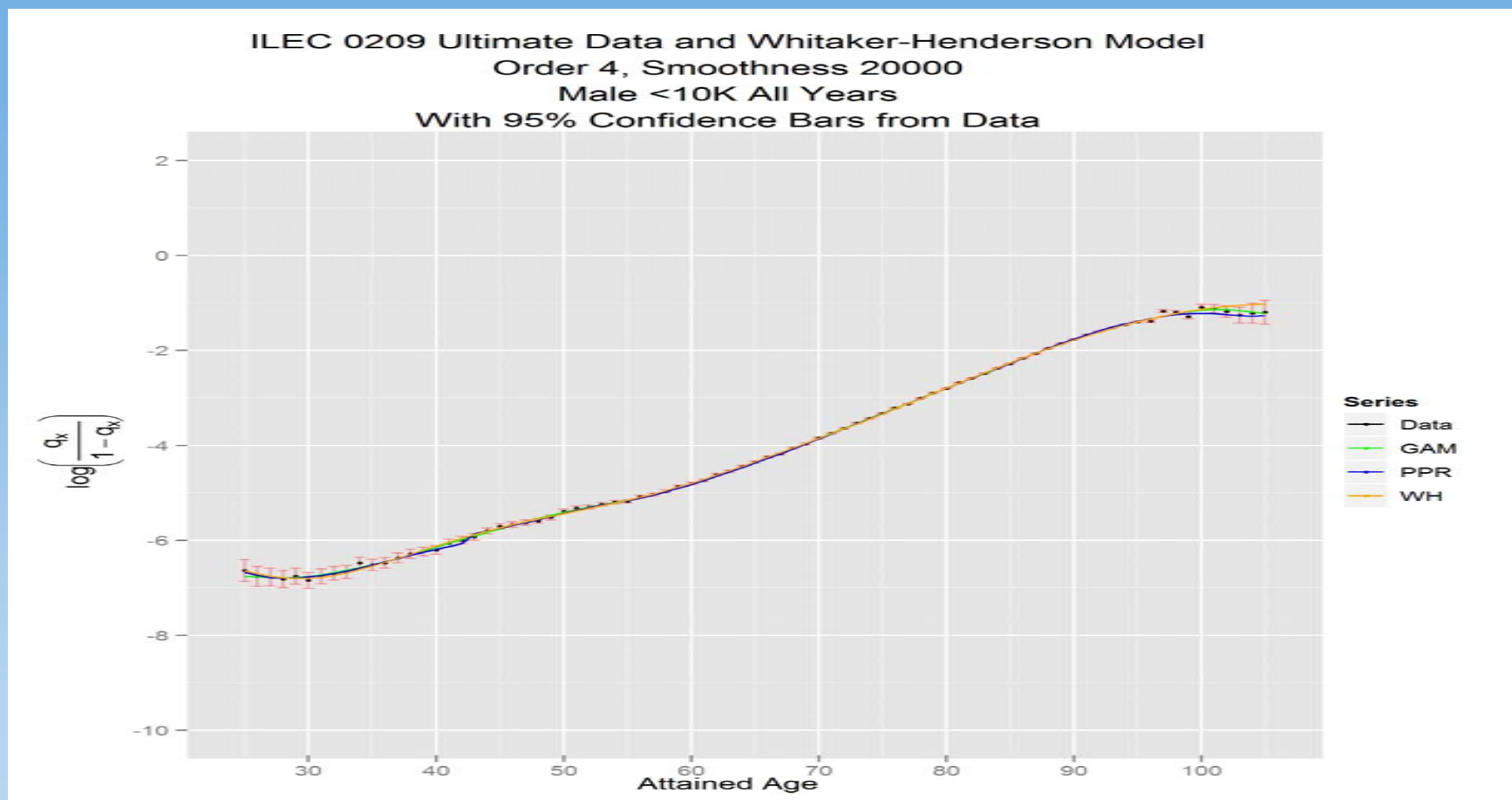
Current Status – Mortality Improvement, cont'd

- Preliminary recommendation
 - For period 2002-2009:
 - Apply actual mortality improvement to adjust each experience year
 - For period 2009-2014:
 - Apply average annual improvement rates varying by attained age and gender
 - Based on general population data (SSA) = average of
 - (a) Average annual improvement rates implied by the SSA's most recent intermediate level projection of mortality for the social security population and
 - (b) Actual average annual improvement rates from historical SSA data for the most recent 10-year period

Current Status – Graduation approaches

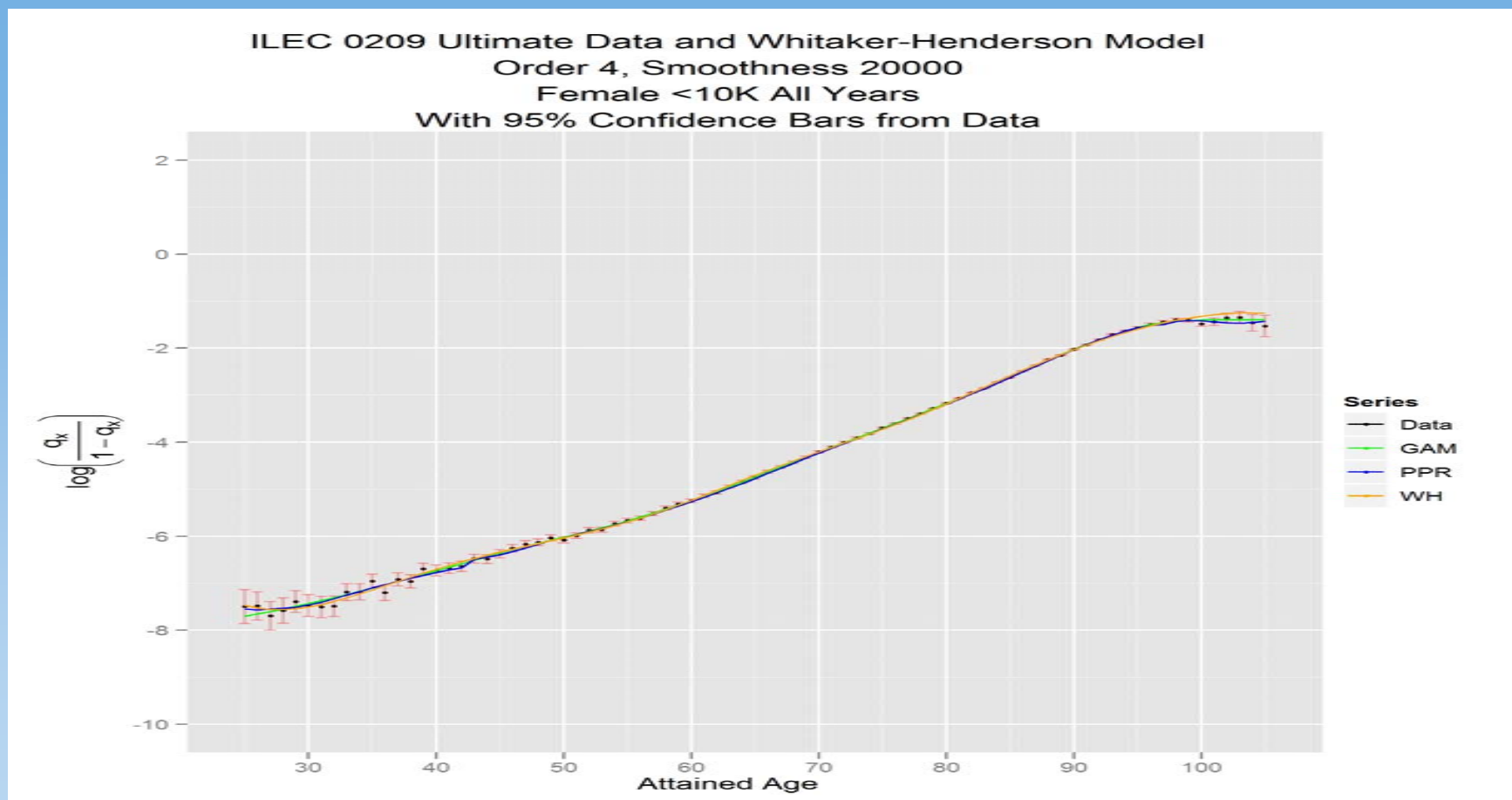
- Explored 3 separate approaches to graduating data and resulting fit
 - Projection pursuit regression (PPR)
 - Whittaker-Henderson (WH)
 - Generalized Additive Model (GAM)
- PPR – good fit with ultimate model but loss of monotonicity and over-fit data in select period
- WH – loss of monotonicity
- GAM – best fit overall, little to no loss of monotonicity

Current Status – Select Period, cont'd



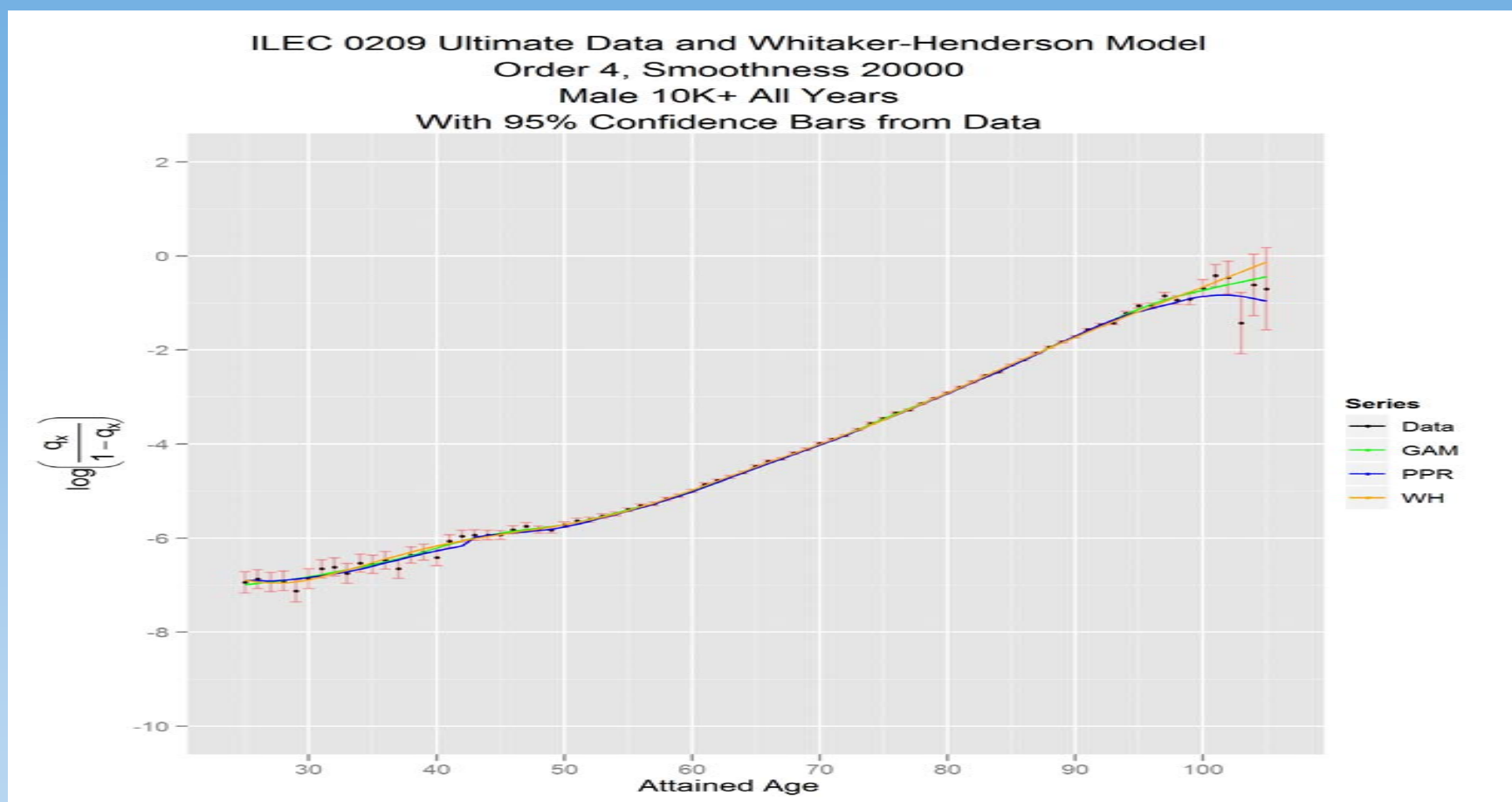
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Current Status – Select Period, cont'd



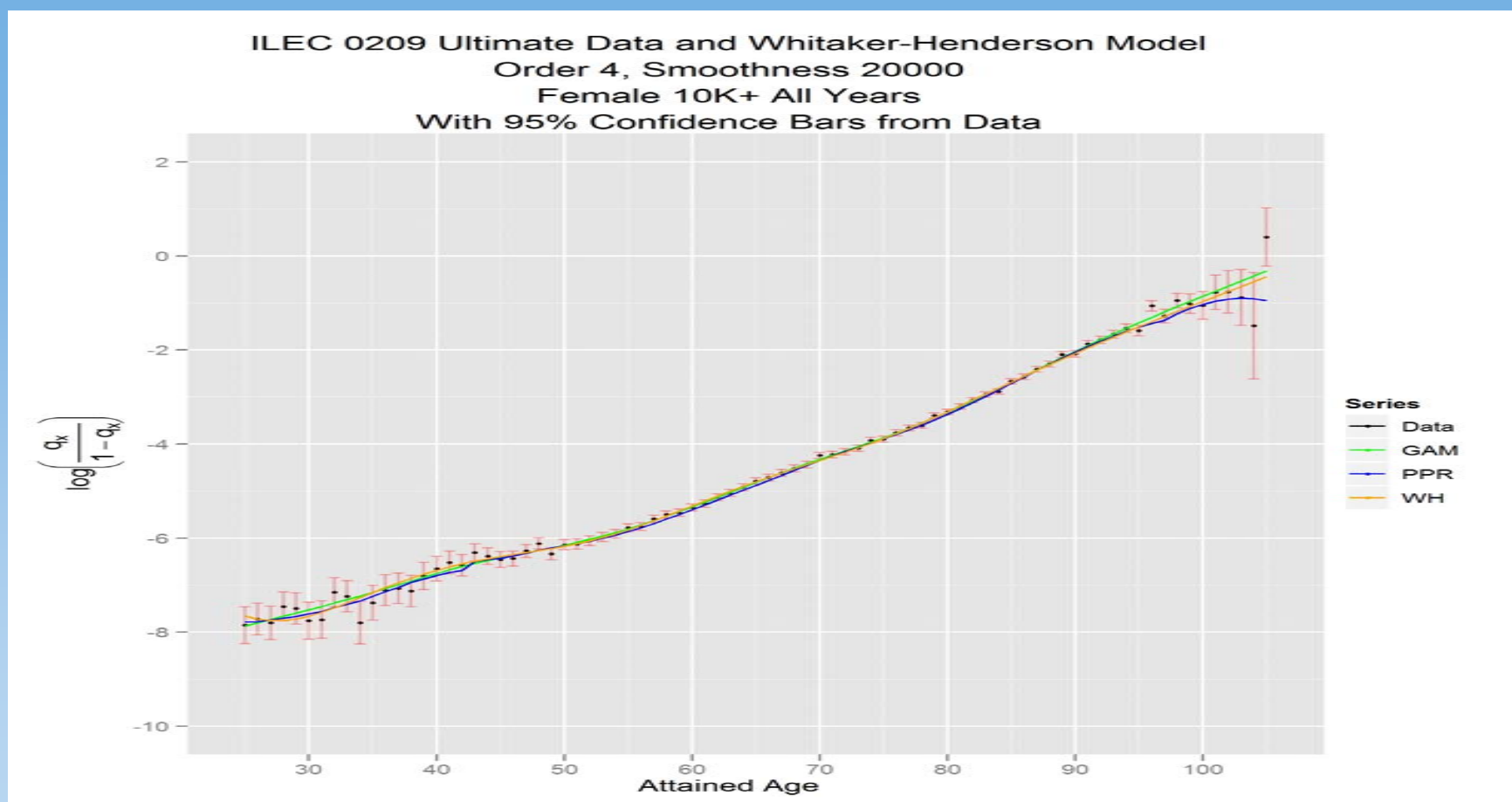
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Current Status – Select Period, cont'd



Source: 2014 Valuation Basic Table Team of the Society of Actuaries & American Academy of Actuaries Joint Project Oversight Group

Current Status – Select Period, cont'd



Source: 2014 Valuation Basic Table Team of the Society of Actuaries & American Academy of Actuaries Joint Project Oversight Group

VBT Next Steps

- Further examine 2007-2009 data to determine changes to initial recommendations, if any
- Prospective select period analysis
- Examine specific issues related to juvenile and older ages
- Determination of select and ultimate mortality rates
- Examination and development of preferred mortality
- Development of preferred wear-off