Mortality Improvements for U.S. Defined Benefit Pension Plan Participants

Webinar
November 17, 2021
Agenda

1. Logistics & Introductions
2. Club Vita’s approach to current life expectancy
3. New research into changing life expectancy
4. Questions
Logistics

• Attendees in listen only mode.

• Questions are welcome. Submit using “Question” function on control panel.

• Audio/technical issues during webinar: call GoToWebinar at 1-800-263-6316.

• Webinar replay and slides will be posted at nirsonline.org/events.
Speakers

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Chief Content Officer
Club Vita
Introduction
Introducing Club Vita

Club Vita is an independent data utility, supporting pension funds, advisors, insurers & asset managers

**VITAL STATISTICS**

- **Founded**: 2008 (UK), 2015 (Canada), 2019 (USA)
- **Retirees tracked**: 3.0m+ (UK), 875k+ (Canada), 800k+ (USA)
- **Plan relationships**: 235+ (UK), 95+ (Canada), 100+ (USA)
- **Re/insurers**: 17 (UK), 11 (Canada), 6 (USA)
- **Advisors**: 2 (UK), 2 (Canada), 5 (USA)

**US VitaCurves users: current and anticipated**

- **Pension advisors**: 2 live users (11), 3 contracting, 5 warm prospects
- **Primary insurers**: 5 live users (11), 1 contracting, 1 warm prospect
- **Reinsurance brokers**: 1 live user (11), 0 contracting, 0 warm prospects
- **Reinsurers**: 4 live users (11), 1 contracting, 0 warm prospects
- **Asset managers**: 2 live users (11), 0 contracting, 0 warm prospects
- **Auditors**: 0 live users (11), 0 contracting, 2 warm prospects
Our preferred delivery model

Translation into plan needs

Your actuaries

Pension Plan

Plan-specific longevity analytics and annual research

Annual mortality experience data
Two steps to calculate life expectancy

Baseline
• Snapshot of current state of longevity
• Objective measure
• Based on past experience

Future trends
• How life expectancy will change in the future
• More subjective measure
• Recent experience a good starting point, but how and when will it change?
Club Vita’s approach to current life expectancy
Two steps to calculate life expectancy

Baseline
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Different approaches

“Top Down” traditional approach

“Bottom Up” Club Vita approach

Collect large amounts of data from similar pension plans

Plan assumption

Average out experience and apply to plan

Combine assumptions for the individuals within plan

Calculate longevity for different individuals based on their characteristics
What affects how long people live?

- Lifestyle
- Occupation
- Health
- Sex
- Affluence
- Something else?
VitaCurves baseline model

- ZIP+4
- Collar
- Sex
- Pension
- Disability?
- More in next gen model
Gender vs. ZIP code
What’s the most important rating factor?

Gender gap = 1.5 years
ZIP+4 range = 3.2 years
(note: identical gap both men and women)

Life expectancy from age 65
Effects of ZIP code longevity modeling

<table>
<thead>
<tr>
<th>LONGEVITY PREDICTOR</th>
<th>INDICATOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lifestyle</td>
<td>ZIP+4 Code</td>
</tr>
<tr>
<td>Affluence</td>
<td>Pension amount</td>
</tr>
<tr>
<td>Retirement health</td>
<td>Disabled vs. normal retirement</td>
</tr>
<tr>
<td>Gender</td>
<td>Male/female</td>
</tr>
<tr>
<td>Occupation</td>
<td>Blue/white collar</td>
</tr>
</tbody>
</table>

Better predictors of longevity that are modeled simultaneously are more accurate for each pension plan.
Capturing diversity

Range of healthy male life expectancy at age 65 in different models

- 3.7 years Pub-2010
- 6.5 years VitaCurves 5-digit ZIP
- 7.7 years VitaCurves 9-digit ZIP
Why it’s important

Expectation of life of a 65 year old in each plan
(2012-2016 data)

Each purple dot shows the average life expectancy of participants in one pension plan in our data set.

Longevity experience of defined benefit pension plans varies widely.

The standard tables capture only part of this diversity.
Changes in future life expectancy
Two steps to calculate life expectancy

**Baseline**
- Snapshot of current state of longevity
- Objective measure
- Based on past experience

**Future trends**
- How longevity will change in the future
- More subjective measure
- Recent experience a good starting point, but how and when will it change?
Recent research from the Society of Actuaries
SoA: Mortality by Socioeconomic Category

Work by Magali Barbieri

- Orders the 3000+ US counties by socio-economic status
- Groups counties into socio-economic deciles
- Tracks life expectancy and mortality rates for each decile over time.
Life expectancy inequality is increasing

*Trends in (period) life expectancy at age 65 for US counties*

What does widening longevity inequality mean for DB pension plans?

Notes: Club Vita graphics based on December 2020 version of SoA life tables by socio-economic decile as published on SoA website
How helpful is the SoA study?

Lots to like…

• Highlights an important societal level issue
• Draws pension plan actuaries attention to socio-economic variations…
• …and the risk of faster trends in higher socio-economic groups (who tend to dominate pensioner liabilities)

Usefulness to pension valuations?...

• Counties too blunt a metric – would you price all of LA County the same?
• Tracks deciles of counties: not individuals (or even counties)
• Risk that DB annuitants a select group e.g. access to health care provision through sponsor
Recent research from Club Vita
Club Vita research

• Compares recent mortality improvements between US DB pension plans and the US population

• Analysis of c100 large single employer pension plans over the period 2013-2018

Paper available for download here:
https://www.clubvita.us/collaborative-research/longevity-inequality-in-the-us
Comparing life expectancy at age 65

Select effect of pension plan membership

Impact of affluence

Faster improvements in DB pensioners than the general population
Future longevity: Club Vita research


<table>
<thead>
<tr>
<th>Group</th>
<th>US Population</th>
<th>Pension Plans</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>0.6%</td>
<td>1.4% (±0.6%)</td>
</tr>
<tr>
<td>Female</td>
<td>0.5%</td>
<td>1.3% (±0.9%)</td>
</tr>
</tbody>
</table>

- Improvement rate in pension plans 1%+ p.a. higher than national population
- ½ – 2 years addition to cohort life expectancy at age, depending on assumed duration
- Potential for between 2-8% addition to liabilities

Paper available for download here:
https://www.clubvita.us/collaborative-research/longevity-inequality-in-the-us
Potential impact on liabilities
Implications for projections

**Illustrative US life expectancy improvement model**

*Regression approach*, projecting recent observed rates into the near future.

*Expert judgement approach*, aiming at improvement rates believed to be sustainable in the long term.

**How do we get to the long term rate?**

**What is the long term rate?**

**How long does it take to get to the long term rate?**
Implications for projections
Adjusting the scale for this insight

Notes: Indicative impacts based upon broad rules of thumb
Implications for projections

Adjusting the scale for this insight

Notes: Indicative impacts based upon broad rules of thumb

Increasing initial rates by 1% increases cohort life expectancy by c. ½ -1 year (2-4% PV)
Implications for projections

Adjusting the scale for this insight

Increasing initial rates by 1% increases cohort life expectancy by $c_{1/2} - 1$ year (2-4% PV)

If also adjust long term outlook could increase cohort life expectancy by $c_{1-2}$ years (4-8% PV)

Notes: Indicative impacts based upon broad rules of thumb
The COVID-shaped elephant
COVID-19

- Recent Society of Actuaries life expectancy improvement model (MP-2021) is calibrated to data through 2019
- Implicitly assumes data is representative of the near future
- … but no COVID-19 experience included in calibration data!
- Year-by-year expectations for COVID-19 mortality rate loads need to be entered into the application tool
- Doing nothing is still a decision

Pension plans must decide how to recognize COVID-19 in life expectancy projections
COVID-19 impact analysis

Is this the same as your plan’s...
• geographical area?
• state?
• socio-economic profile?
• actual experience?

Join Club Vita to find out how COVID has affected your plan!
Different emerging experience among pension plans

- Were your pensioners geographically concentrated in hard-hit areas?
- Is your plan more male or female dominated?
- What is the age profile of your pensioners?
- Is your plan in an industry on the front lines of the pandemic?
- Do you offer retiree health care?

Source: data from two Club Vita pension plan subscribers
Club Vita COVID-19 scenarios

Healthcare Decline  Long Road to Recovery  Bump in the Road  Innovation in Adversity

LIABILITY IMPACTS (TYPICAL PLANS)

2%  1%  0%  -1%  -2%  -3%  -4%  -5%

https://www.clubvita.us/collaborative-research/covid-19-longevity-scenarios-a-bump-in-the-road-or-a-catalyst-for-change
Questions?
Thank you