

COUNTRY REPORT – USA

This is the Country Report for the United States of America as of April, 2016.

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NEW EXPERIENCE STUDIES / RESEARCH / MORTALITY TABLES

LONG-TERM CARE INSURANCE PERSISTENCY

This report presents results for industry long-term care insurance (LTCI) persistency. This is the fourth in a series of studies conducted jointly by LIMRA and the SOA Long-Term Care Experience Committee. It examines persistency based on twenty participating companies reporting both voluntary lapse and total termination activity for calendar years 2008 through 2011. The overall experience was collected for the calendar years 2000 through 2011. The results indicate that LTCI persistency continues to increase, with individual LTCI business increasing more than group LTCI. The reports and accompanying information can be obtained via the following links: [LTC Persistency Study - 2016](#), [LTC Experience data - 2015](#) and [LTC Report - 2015](#).

Period Covered: 2000 - 2011
Claims in underlying study: 1.5 million total terminations including 270,000 deaths
Contributors: 22 U.S. LTC carriers covering approximately 75% of total U.S. business
Products covered: Long term care insured U.S. policies, both individual and group coverages
Factors: Voluntary lapses and mortality (provided separately)

STRUCTURED SETTLEMENT MORTALITY EXPERIENCE REPORT

The SOA Structured Settlement Experience Subcommittee of the Individual Annuity Experience Committee has completed its report on the results of the latest intercompany study of mortality experience under structured settlement annuities for the exposure years 2000-08. In lieu of printed tables, the two Microsoft Excel files published with this report provide pivot tables, which access the database and provide the breakdowns described in the report.

Structured Settlement annuities consist primarily of workmen's compensation, individual long-term disability claims, and lawsuit settlements that provide a life-contingent income to the plaintiffs.

Period Covered: 2000 - 2008
Claims in underlying study: 7,749 claims, including 3,380 substandard risks
Products covered: Structured settlement annuities
Factors: Mortality

STUDIES / RESEARCH / TABLES IN PROGRESS

NEXT INDIVIDUAL LIFE MORTALITY TABLE – 2017 CSO / 2015 VBT TABLES / RRTOOL

The approval process continues for the 2015 VBT and 2017 CSO tables. The 2017 CSO (valuation) tables were developed using the 2015 VBT (experience) tables as the base upon which valuation loads were applied. Unloaded versions of the 2017 CSO tables are the equivalent of the 2015 VBT tables. They were created by improving the 2015 VBT tables for two years of mortality improvement, and with a few other minor adjustments. Contact Jack Luff (email- jluff@soa.org) at the SOA for more information.

This new package of tables is designed to be used with the introduction of Principles Based Reserving in 2017. In addition to providing distinct mortality rates by gender, smoking status, age and duration, relative risk is a unique feature. The preferred structure and relative risk tables are required for the valuation of the preferred risk programs which are predominant in the U.S. A Relative Risk Score (RRS), called the RRTool, calculator is also being made available to evaluate the broad range of preferred class qualification standards used in the market. All tables have been exposed. Although final versions are not yet available, the RRTool and a number of preliminary reports have been published.

The most recent published document on the table is: [2017 CSO tables - 2016](#). A report indicating the reserve impact of the new tables has also been published. It can be found in the link: [2017 CSO Impact Report](#). The most recent document describing the RRTool (called the UCS calculator in this document) is available at the link: [RRTool Calculator](#). The most recent 2015 VBT tables are available at: [2015 VBT tables](#).

OTHER ITEMS

LIVING TO 100 SYMPOSIUM – SOCIETY OF ACTUARIES – JANUARY 4-6, 2017, ORLANDO FL

LIVING to 100 is a research effort which includes a triennial international research symposium. Sponsored by the Society of Actuaries, the symposium brings together thought leaders from around the world to share ideas and knowledge on aging, increases in survival rates and the resulting increase in aging populations together with its implications to social, financial, retirement and health care systems. The symposium also examines possible solutions to the challenges and opportunities created. A diverse range of professionals, scientists and academics gather at this prestigious event to discuss the latest scientific information on how and why we age, measure current mortality and project future rates of improvement in survival, identify potential advantages and risks associated with the increasing number of retirees and suggest answers to difficult issues resulting from individuals living longer. The outcome of each Living to 100 event is a lasting body of research to educate and aid individuals and policymakers in addressing the potential needs and services of the future advanced-age populations. Further information can be found at this link: [Living to 100 symposium](#).

This symposium occurs every three years.

CONVERSION PROVISION ASSUMPTIONS SURVEY

A new [SOA report](#) examines the conversion provision on level term products in the U.S. life insurance industry. Based on a survey of 21 companies, the report presents results on assumptions and product features used for pricing and administering term conversions.

Generally, term products in the United States have an option to convert to a permanent policy. Exercising this option usually does not require additional underwriting. Because this is an option and not a requirement, an element of anti-selection is present for those that elect to convert rather than go through full underwriting again for a potentially cheaper product. The experience and survey results from this study will improve companies' understanding of the potential mortality impact of conversions while providing insight into market practices and trends as of September 2014 related to conversion.

LIFE AND ANNUITY LIVING BENEFIT RIDERS

In addition to several others, this paper has several goals in relation to each living benefit rider type: to define the various living benefit riders listed above, to explore how underwriting is handled, and to comment briefly on the overall level of claims activity experienced thus far compared to pricing expectations. The paper can be found at: [Living Benefits Report](#)

MORTALITY IMPROVEMENT SCALE MP-2015

The SOA and its Retirement Plans Experience Committee (RPEC) have released an update to Mortality Improvement Scale MP-2014, which was published in October 2014. The updated scale, titled **Scale MP-2015**, was created to incorporate more recent historical mortality improvement data that has become available since the development of MP-2014. Specifically, MP-2015 incorporates two additional years (2010 and 2011) of historical Social Security Administration data. The report can be found at: [Mortality Improvement Scale MP-2015](#).

JOINT LAST SURVIVOR INSURANCE

The Joint and Last Survivor Survey Subcommittee of the SOA's Committee on Life Insurance Mortality and Underwriting Surveys published the results of a survey designed to provide a detailed review of product features, underwriting and various other practices for joint and last survivor (JLS) policies, and to identify those aspects which are unique to JLS product forms. The report can be found at: [JLS Survey Report](#)

PREDICTIVE MODELS

The SOA's Committee on Finance Research issued a new [predictive analytics report](#) examining the process of creating models and interpreting results.. Topics include data selection, model development and model validation, among others related to predictive analytics. Although, the report illustrates a case study on applying predictive modeling to long-term disability pricing, the underlying principles could have value in other experience study environments.

CAUSES-OF-DEATH: WHAT DO WE KNOW OF THEIR INTERDEPENDENCE

Over the last century, the assumption usually made was that causes of death are independent, although it is well-known that dependencies exist. Recent developments in econometrics allow, through Vector Error Correction Models (VECMs), to model multivariate dynamic systems including time dependency between economic variables. Common trends that exist between the variables may then be highlighted, the relation between these variables being represented by a long-run equilibrium relationship. In this work, VECMs are developed for causes-of-death mortality. The five main causes of death are analyzed across 10 major countries representing a diversity of developed economies.

This paper was published in the North American Actuarial Journal – May 2015, volume 19, issue 2. It is authored by Séverine Arnold (-Gaille) & Michael Sherris. The MWG has had preliminary presentations on the contents of this paper, as Séverine is a member. The paper can be found at: [Causes of Death Interdependence](#)

THREE FACTOR MORTALITY MODEL

This paper proposes a three-factor model for mortality modeling in which the dynamic of the entire term structure of population mortality rates can be expressed in closed form as a function across age (x), across time (t), and for y years ($y \geq 1$) after t . The proposal differs from most existing models where only the one-year mortality rate is considered ($y = 1$). Using population mortality data for Italy, the U.S., and the U.K., the model's forecasting capability is assessed, and a comparative analysis with other models is provided.

This paper was published in the North American Actuarial Journal – May 2015, volume 19, issue 2. It is authored by **Vincenzo Russo, Rosella Giacometti, Svetlozar Rachev & Frank J. Fabozzi**. The paper can be found at: [Three factor mortality model](#)

PREDICTORS OF EXCEPTIONAL LONGEVITY: EFFECTS OF EARLY-LIFE AND MIDLIFE CONDITIONS, AND FAMILIAL LONGEVITY

Knowledge of strong predictors of mortality and longevity is very important for actuarial science and practice. Earlier studies found that parental characteristics as well as early-life conditions and midlife environment play a significant role in survival to advanced ages. However, little is known about the simultaneous effects of these three factors on longevity. This ongoing study attempts to fill this gap by comparing centenarians born in the United States in 1890–1891 with peers born in the same years who died at age 65.

This paper was published in the North American Actuarial Journal – September 2015, volume 19, issue 3. It is authored by **Leonid A. Gavrilov and Natalia S. Gavrilova**. The paper can be found at: [Predictors of Longevity](#)

MORTALITY, HEALTH, AND MARRIAGE: A STUDY BASED ON TAIWAN'S POPULATION DATA

It is surmised that marital status is related to health and longevity. Many studies have found that married persons have a lower mortality rate than the unmarried. This study uses Taiwan's marital data for the whole population (married, unmarried, divorced/widowed) to evaluate if the marital status can be a preferred criteria.

This paper was published in the North American Actuarial Journal – September 2015, volume 19, issue 3. It is authored by **Hsin Chung Wang & Jack C. Yue**. The paper can be found at: [Marriage as a predictor of mortality: Taiwan](#)

MORTALITY OF SMOKING BY GENDER

This article compares smoking prevalence and cessation by gender and the effect on smoking-attributable and, in turn, all-cause mortality

This paper was published in the North American Actuarial Journal – September 2015, volume 19, issue 3. It is authored by **Sam Gutterman**. The paper can be found at: [Smoker Mortality](#)

LOGISTIC REGRESSION FOR INSURED MORTALITY EXPERIENCE STUDIES

This paper presents a logistic regression model based on U.S. insured mortality experience study with a focus on gaining study efficiency and effectiveness by addressing multiple analytical predicaments within one statistical modeling framework.

This paper was published in the North American Actuarial Journal – December 2015, volume 19, issue 4. It is authored by *Zhiwei Zhu, Zhi Li, David Wylde, Michael Failor & George Hrischenko*. The paper can be found at: [Logistic regression model for insured lives](#).

FAMILIAL RISK FOR EXCEPTIONAL LONGEVITY

This paper updates estimates of sibling relative risk of living to extreme ages using data from more than 1700 sibships, and begins to examine the trend for heritability for different birth-year cohorts.

This paper was published in the North American Actuarial Journal – March 2016, volume 20, issue 1. It is authored by **Paola Sebastiani, Stacy L. Andersen, Avery I. McIntosh, Lisa Nussbaum, Meredith D. Stevenson, Leslie Pierce, Samantha Xia, Kelly Salance & Thomas T. Perls**. The paper can be found at: [Familial impact on longevity](#)

COUNTRY BACKGROUND

GENERAL POPULATION

DEMOGRAPHICS

The current population count, life expectancies and the population pyramid were updated since the last report.

Basic Information			
Current population (2016/04)	324 million		
Current period life expectancy			
- At birth (in 2011)	Males – 76.3 years, females – 81.1 years (published 2015-09)		
- At 65 (in 2011)	Males – 17.8 years, females – 20.3 years (published 2015-09)		
Population Pyramid (as of 2014 – percent of total population); median age: Male – 36.3 years, female – 39.0 years.	Age range	Males	Females
	All	49.2%	50.8%
	0	0.6	0.6
	1-4	2.6	2.4
	5-14	6.6	6.3
	15-24	7.1	6.7
	25-34	6.9	6.8
	35-44	6.3	6.4
	45-54	6.7	6.9
	55-64	6.1	6.5
65-74	3.9	4.4	
75-84	1.8	2.4	
85+	0.7	1.3	
Data sources:	CDC/NCHS, National Vital Statistics System, Mortality; United States Census Bureau; Health, United States, 2015; wikipedia		

POPULATION MORTALITY TABLES

The main source of U.S. population statistics is the U.S. Center for Disease Control and Prevention (www.cdc.gov). The most recent report, published annually, on population mortality is “United States Life Tables, 2011”, published in September 22, 2015. This report is new. It was published since the prior U.S. country update. More recent interim reports are available on subsets of the full data.

POPULATION MORTALITY IMPROVEMENT

Life expectancy at birth is a common index used to indicate the level of mortality improvement. The table below provides the official U.S. government all population life expectancies at various times. It is provided annually by the US Center for Disease Control (CDC). The most recent 2011 figures were published on September 22, 2015. As a cautionary note, this index is a very rudimentary indicator. It is not a good view of even the most important mortality improvement nuances. It is used because it is simple to understand.

U.S. general population life expectancy at birth in years			
Calendar Year	Both sexes	Male	Female
2011	78.7	76.3	81.1
2010	78.7	76.2	81.0
2009	78.5	76.0	80.9
2008	78.2	75.6	80.6
2007	78.1	75.5	80.6
2006	77.8	75.2	80.3
2005	77.6	75.0	80.1
2000	76.8	74.1	79.3
1995	75.8	72.5	78.9
1990	75.4	71.8	78.8
1985	74.7	71.1	78.2
1980	73.7	70.0	77.4
1975	72.6	68.8	76.6

PROTECTION INSURANCE

MARKET BACKGROUND

This section should provide high level details on the following:

- Individual life products sold: Term, Universal/Variable Life, Whole Life. Virtually no endowment. Sold as protection vehicles, with cash value products used for estate planning. Separate annuity/pension products are the main vehicle for savings needs.
- Levels of underwriting: provided in a separate IAA-MWG global report “Underwriting Around the World” document)
- Group products are common. Many employers provide group life insurance in their employee benefit packages, including both coverages paid by the employer and voluntary coverages paid for by the employees.
- No mandated coverages.
- Government Social Security death benefits provided universally, but amounts are minimal.

MORTALITY TABLES

The most recent individual life insurance mortality table is the 2008 VBT. This table provides best estimate mortality without margins. There is no corresponding valuation table. This table can be found on the SOA website: [2008 VBT Report](#).

The next version is the 2015 VBT and corresponding 2017 CSO tables. All tables have been exposed. See the “Studies/Research/Tables in progress section above. These tables are expected to be introduced in conjunction with the new “Principles Based Reserving” valuation approach. The CSO tables are expected to be approved for valuation in 2016, effective 1/1/2017. In the U.S., new valuation tables have a 3 year transition period during which companies can continue to use the existing tables, at their option.

The predecessor table to the 2008 VBT table is the 2001 VBT table. The 2001 CSO was developed by adding conservatism margins to the 2001 VBT. Because no valuation table was included in the 2008 VBT work, the 2001 CSO table is still the current prescribed valuation mortality table, The table can be found on the SOA website: [2001 VBT Report](#).

MORTALITY IMPROVEMENT

Future looking mortality improvement scales are not usually attached to life tables. Improvement factors are used only for the purpose of adjusting experience from the central point of the experience to the year for which the table is being developed. For example, the 2008 VBT tables were developed from experience from 2002-2004. Therefore, the experience rates needed to be adjusted by having five (5) years of mortality improvement. These factors tend to be close to actual recently experienced mortality improvements. No forward-looking element is included in their development. The written reports documenting the table construction normally include the improvement factors used.

A new source of current U.S. general population experience (Rapid Release) by quarter and cause of death has recently been published by the CDC. It may be important to note that age-adjusted mortality experience for the 12 months ending with the third quarter of 2015 increased by 1.6% over the corresponding period of 2014. Only cancer and HIV/AIDS causes of death improved over this period.

The most recent document is available at [Rapid Release Report](#)

The values in the table below are from that report:

Quarter	All causes – 3 month period (age-adjusted rate per 100,000)			All causes – 12 month period (age-adjusted rate per 100,000)		
	2014	2015	Change	2014	2015	Change
Q1	769.6	797.9	+3.7%	719.2	729.4	+1.4%
Q2	706.9	712.4	+0.8%	719.2	731.1	+1.7%
Q3	679.1	680.4	+0.2%	719.9	731.4	+1.6%
Q4	735.8	N.A.	N.A.	723.2	N.A.	N.A.

RETAIL LONGEVITY PROTECTION

MARKET BACKGROUND

Not available

MORTALITY TABLES

Uninsured private pensions

The most recent table for uninsured private pensions is the newly published RP-2014 table. Details can be obtained through the link [SOA RP-2014 Mortality Tables](#). This is a new study that is referenced in the “New Experience Studies / Research / Mortality Tables” section above. The primary focus of the RP-2014 work was to provide a comprehensive review of recent mortality experience of uninsured private retirement plans in the United States. Although available, Public Pension plan retiree data was specifically excluded from the analysis. The prior version of this table was the RP-2000 table.

Individual Annuity Mortality

The most recent table for individual payout annuities is the 2012 Individual Annuity Mortality Table. The full report can be obtained from the link: [2012 IAM table](#). The prior version of the table was the Annuity 2000 Mortality Table.

Group Annuity Mortality

The most recent table for annuity experience under group pension contracts is the the 1994 GAM (basic table is the UP-94) table. The most recent experience study for this type of business was published in March, 2015 for the experience period 2007-2010. It can be obtained by following the link: [GAM 2007-2010 experience study](#)

MORTALITY IMPROVEMENT

Uninsured private pension plan

The RP-2014 Mortality Table report referenced in the prior section also includes a separate mortality improvement report.

Individual Annuity Mortality

The 2012 IAM Mortality table report referenced in the prior section includes mortality improvement assumptions.

Retirement Pension Plans

The MP-2015 scale is the current mortality improvement assumption for retirement pension plans. Documentation of the file is provided at the location: [Mortality Improvement Scale MP-2015](#)

Civil Service Retirement System

The most recent 2015 [valuation report](#) of the Civil Service Retirement System, published in January 2016, adopted the following (change from prior report) mortality improvement scale. The report also provides the mortality rates of retirees and disabled retirees. *This document has been updated since the prior U.S. country report.*

Mortality rates are revised to incorporate projected generational mortality improvement for employees, survivors and non-disabled retirees. An ultimate 1.0 percent annual rate of mortality improvement (less than 1.0 percent above age 90) is assumed beginning in fiscal year 2020. Assumed mortality improvement prior to 2020 grades linearly from experience based improvement factors, which are

given 100 percent weight in FY 2010, to the ultimate rate of 1.0 percent that is given 100 percent weight in 2020 and beyond.

RELEVANT ORGANISATIONS

GOVERNMENT STATISTICS DEPARTMENTS

Centers for disease control and prevention (CDC) – The National Center for Health Statistics (NCHS), part of the CDC, is the most up-to-date and comprehensive source for population mortality. This is the source of the U.S. data provided to the WHO databases. Websites are: www.cdc.gov and www.cdc.gov/nchs.

Census – The U.S. conducts a census every 10 years. Reports, including mortality, etc developed from this complete data are provided in the website: www.census.gov. This is the most accurate data. It is not the main source of data, the CDC is.

Labor Bureau – The U.S. Bureau of Labor provides certain statistics on the U.S. labor force. At best, this source might provide adjunct data to what is available through the CDC. The website is: www.bls.gov.

Social Security Administration – The United States Social Security Administration (SSA) is an independent agency of the United States federal government that administers Social Security, a social insurance program consisting of retirement, disability, and survivors' benefits.

SSA's Office of the Actuary produces annual life tables. Further information can be obtained from the link: [SSA Actuarial](#)

Federal Retirement Systems – Congress created the Federal Employees Retirement System (FERS) in 1986, and it became effective on January 1, 1987. Since that time, new Federal civilian employees who have retirement coverage are covered by FERS.

Civil Service Retirement Act - It became effective on August 1, 1920, established a retirement system for certain Federal employees. It was replaced by the Federal Employees Retirement System (FERS) for Federal employees who first entered covered service on and after January 1, 1987

ACTUARIAL SOCIETIES OF THE COUNTRY

American Academy of Actuaries (AAA)

American Retirement Organization (American Society of Pension Professionals & Actuaries (ASPPA) recently merged into this organization with other non-actuarial organizations)

Casualty Actuarial Society (CAS)

Conference of Consulting Actuaries (CCA)

Society of Actuaries (SOA)

INSURANCE REGULATION

State insurance regulations - Coordinating insurance organization: National Association of Insurance Commissioners (NAIC). This organization provides model laws which each state decides whether to implement into law. This could be implemented with or without changes. New York (State) Insurance Department has a reputation for not going along with the NAIC.

Federal insurance regulation - Insurance regulation is mostly the responsibility of each state. There is some federal oversight.

In 2010, The Dodd-Frank Wall Street Reform and Consumer Protection Act established Treasury's Federal Insurance Office (FIO) and vested FIO with the authority to monitor all aspects of the insurance sector, monitor the extent to which traditionally underserved communities and consumers have access to affordable non-health insurance products, and to represent the United States on prudential aspects of international insurance matters, including at the International Association of Insurance Supervisors. In addition, FIO serves as an advisory member of the Financial Stability Oversight Council, assists the Secretary with administration of the Terrorism Risk Insurance Program, and advises the Secretary on important national and international insurance matters