From Geo-Science to Gero-Science

Risk Management Solutions is the world’s leading provider of independent risk modeling systems for the property and casualty insurance industry. Now it has released RMS LifeRisks™, a software platform providing a suite of models for the life insurance and pension markets.

These models blend evidence from a wide range of scientific fields into actuarial analytics to improve decision support for managers of mortality risk.

To learn more about RMS LifeRisks, visit: rms.com/liferisks.
Quantifying Risk Across Perils

RMS models provide a causal analysis of each of the perils that give rise to mortality shocks. Risk can be quantified across perils, geographies, lines of business and rolled-up to provide a company-wide view of risk. By gaining a deeper understanding of the drivers of risk, companies can enhance their portfolio management decisions, use capital to maximize profitability, and leverage model output to help meet Solvency II requirements.

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**Excess Mortality Risk Models**

**Pandemic Influenza**

The influenza virus is one of the fastest mutating pathogens. Genetic shifts that evade human defenses cause global pandemics.

At least 30 previously unknown diseases have emerged in the last few decades, including HIV, SARS, Ebola, and Hepatitis C and E. Pandemic influenza remains a potent threat, with new outbreaks of avian flu providing the potential for a humanly transmissible influenza pandemic of unprecedented virulence.

**Emerging Infectious Diseases**

At least once a decade a new disease evolves for which medical science has no treatment.

**Mass-Casualty Terrorism**

Terrorists threaten mass casualty attacks using weapons of mass destruction, particularly posing group life concentration risks.

**Natural Hazards**

Earthquakes, tsunamis, floods, and other natural hazards can kill tens of thousands of people, even in the developed world.

**Other Causes**

Industrial and transport accidents, extreme weather, and other events drive additional mortality volatility.
Modeling the Future

The RMS Longevity Risk Model consists of thousands of scenarios showing how the future may develop, tracking how causes of future mortality improvements may play out. Medical science provides insights into the effects of different causes of mortality change. This approach blends best-of-class actuarial techniques with medical science.

**RMS Longevity Risk Model**

**Vitagions: The Causes of Longevity Risk**

**Lifestyle Trends**
Personal decisions like smoking habits, diet and exercise have strong influence on mortality levels.

**Health Environment**
The availability of healthcare and public health standards control the living conditions that influence mortality.

**Retardation of Aging**
Research into radical new approaches of extending healthy life may impact mortality levels some time in the future.

**Medical Intervention**
New medical treatments, drugs, and advances in bio-technology bring about extensions in life expectancy.

**Regenerative Medicine**
New technologies such as stem cell therapy and nanomedicine promise future mortality improvements.

**Unique Approach to Quantify Future Risk**
Mortality improvement is driven by a combination of social, economic, and medical factors. Detailed analysis of each 'vitagion' - a cause of mortality improvement - provides an explanation of recent trends and provides a framework for examining the potential for extreme future improvements. Unexpectedly large improvements that pose a threat to financial viability arise from extreme trajectories of a vitagion category, or combinations of several scenarios.

**Base Mortality Risk Models**
RMS models recognize the uncertainty in base mortality tables arising from:

- Statistical uncertainty in historical mortality experience
- Base risk uncertainty in aligning a portfolio with standard tables
- Table changes with new statistical insights

RMS modeling allows the client to specify their base mortality table, or choose from an extensive library of industry standards. A single analysis can use many different base mortality tables assigned to membership groups based on gender, pension amount, postcode groups, or other rating factors defined by the client.
Portfolio Management: Powered by Science. Controlled by You.

Insights into your portfolio
Import your exposure data. Review, analyze and compare the structure of your books of business. Ensure you use the highest quality data.

- Multiple different formats of data supported
- Utilize your own risk groups
- Data tracking and clean up
- Manage multiple portfolios
- Life insureds
- Annuitants
- Pension members

Harness power for running analysis
Create a job queue of your analyses. Use the power of the cloud to process at lightning speeds.
Products

RMS LifeRisks Platform
RMS models, data products, and analysis outputs are provided to clients on the RMS LifeRisks platform. RMS LifeRisks platform is a hosted application enabling clients to access RMS models and perform their own portfolio-specific analysis.

Risk Diagnostics: The power of the scenarios
Drill down into your model results. Understand the drivers of risk in your exposure. Identify subsets of your portfolio and books of business that are contributing most to the risk you face. Pick scenarios that represent the key thresholds of probability of loss. Derive narratives to communicate risk concepts. Use deterministic scenarios to explore specific issues.

Model Your Risk: Insights from leading scientific research. In Real Time.
Obtain full probabilistic analysis from RMS models. Derive loss exceedance probabilities for individual portfolios. Combine results of different peril analyses on multiple portfolios across different countries.

Export outputs into your business processes
Create reports and extract risk metrics. Export scenario mortality improvement tables for input into your standard financial models. Archive analysis for month-on-month tracking of risk positions.
Improving Capital Management

Solvency II: providing better models
Solvency capital requirements need rigorous and evidence-based analysis. RMS provides its models for use as internal models by clients to satisfy their Solvency II compliance.

20 years of Evidence
RMS been innovating in the risk management industry for more than two decades, providing the capital management tools relied on by the large majority of the property and casualty industry.

Scientific Integrity & Rigor
Objective evidence of the underlying risk processes forms the analysis philosophy behind RMS models. Diligence in gathering data and applying rigorous interpretation is the hallmark of RMS science.

Independent and Impartial
RMS provides risk analyses. Pure and simple. We have no vested interests, as our models support insurers, reinsurers, intermediaries, and the capital markets. The assessment of risk that we provide is based on a fresh analysis of all the data.

Capital Management. The Next Generation.
RMS models are designed for incorporation into a company’s business management processes. By making it easy to run analyses and organize data, a company can monitor its risk positions at frequent intervals, respond to change, and optimize its risk management strategy.
Risk Transfer
RMS analytics are used to design and support risk transfer decisions that protect companies and optimize their capital efficiency. RMS models provide an independent and objective view of the risk for both sides of the transaction. Narrative and scenarios from the models help both sides develop an intuitive understanding of the risk being transferred.

Risk transfers provide financial protection and capital efficiency gains, including mitigation of regulatory capital requirements.

Risk Transfer to the Capital Markets
RMS has a dedicated team for capital markets transactions, providing support to clients in the application of modeling to insurance-linked securities.

**Expertized Modeling Agent**
Design a transaction and provide a risk report for a proposed transaction.

**Rating Agency Liaison**
Work with the rating agency to get a successful rating on the transaction.

**Development of the Offering Circular**
Provide supporting methodology and legal documentation for potential investors.

**Investor Roadshow**
Make presentations to potential investors as part of the marketing of the transaction.

**Calculation Agent**
Provide independent arbitration of settlement.

Hedging Mortality and Longevity Risk
Insurers managing risk capital requirements for both life insurance exposure and annuity liabilities need to understand the causes of fluctuations in both. Scenarios of the causes of change in future payouts enable the understanding of how different books of business offset each other. Understanding the causes of change provide insights into correlation structures and enables efficient risk capital management transactions.
Service Beyond the Screen

RMS models provide an independent and objective view of the risk, and are calibrated using verifiable scientific evidence about the processes that drive that risk. The RMS team is experienced in providing validation and justification support, and in knowledge transfer to companies who use the models and are required to defend risk management decisions that arise from applying the models.

Consultancy Services
Use RMS risk analysis expertise to approach new solutions, explore complex issues, or apply customized analytics. The multinational LifeRisks consultancy team has the expertise to help you effectively manage your mortality risks, meet regulatory challenges, and capitalize on business opportunities.

CAPITAL MANAGEMENT
Solvency II capital modeling for longevity, mortality, catastrophe and mortality-longevity hedge
Internal model calibration, internalization of models, and technical documentation
Economic capital modeling for mortality and longevity risks
Insurance product design

RISK TRANSFER
Analyzing risk underlying ceded or assumed reinsurance
Risk analysis and structuring of excess mortality and longevity securitizations
Quantification of hedge benefit associated with mortality-longevity risk swaps
Evaluation of pension de-risking options

Understanding the Risk
RMS consulting projects focus on providing not just a risk quantification, but a complete understanding of the underlying drivers of risk; actionable results which enable risk to be managed.
The RMS LifeRisks Team

RMS lives at the intersection of modeling science, technology, and the insurance industry. For over 20 years RMS has been providing leading decision-support risk analytics to the insurance industry through world-class software.

RMS LifeRisks is a team dedicated to applying analytical science to the life insurance and pension risk management industry.

Modeling Science
A specialized team of bio-scientists monitors and interprets new medical science for insurance decision support

Modeling
Recognized authorities in stochastic risk modeling guide the design of models to apply science to mortality analytics

Technology
Based in California's Silicon Valley, the models and solutions of RMS are delivered via a state-of-the-art software platform that maximizes computing power and utility to our clients

Insurance Industry
Independent and objective, RMS works with insurers, re-insurers, and brokers on applying models to support their business processes

Expertise
The development of risk models requires the integration of multiple skill sets and domain knowledge from a wide range of disciplines. Modeling approaches are designed by career modelers, well experienced in developing analytics for insurance risk.

RMS staff work to blend statistical and mathematical frameworks with medical expertise and social sciences.

Modelers and Scientists: 45%
Insurance Client Service and Consultancy: 20%
Technologists and Product Software Engineers: 35%