

This edition highlights the UN report projecting major shifts in the demographics of the world's population, new initiatives to combat dementia, the shifting emphasis toward preventative healthcare, and interesting clues from global life expectancy rankings about mortality improvement.

WAR DECLARED ON ALZHEIMER'S DISEASE

The U.S. government has launched an aggressive national plan to prevent and treat Alzheimer's disease by 2025. The recent National Alzheimer's Project Act establishes a clear focus to find new treatments for Alzheimer's disease. The plan pledges an extra \$50 million in 2012 and an additional \$100 million in 2013. It could have far-reaching effects on the life insurance industry in many countries.

Alzheimer's disease is the sixth-leading cause of death in the United States and the only cause of death among the top 10 that cannot be prevented, cured or even slowed. There are 5.4 million people in the U.S. currently suffering from Alzheimer's disease and around 496,000 people in the U.K. These numbers are expected to increase by 30% by 2025 and to more than double by 2050 as we reduce premature deaths from other causes.

A person's life expectancy is massively reduced with the onset of dementia. Life expectancies for a 90 year old non-smoking woman are reduced from around 6 years to 1 year. For a 70 year old non-smoking male, life expectancy drops from around 18 years to 3.

The costs of treating dementia and caring for sufferers are very high. The costs of Alzheimer's are forecast to reach \$1.1 trillion by 2050. Costs to Medicare and Medicaid will increase by a factor of five.

The 'Path to Treatment and Prevention' plan was developed

by experts in Alzheimer's disease and calls for a comprehensive, collaborative approach across federal, state, private and non-profit organizations. The U.S. government has pledged to give an extra \$50 million in 2012 and an additional \$100 million in 2013 to fight this disease. The funds will support additional research, improve public awareness of the disease, support provider education programs, invest in caregiver support and improve data collection.

Specifically, two major clinical trials by the National Institute for Health are being funded. One is a \$7.9 million effort to test an insulin nasal spray for treating Alzheimer's disease. The second study, which is the first prevention trial in people with the highest risk for Alzheimer's is costing \$16 million.

The plan has provided resources for caregivers and a new website, www.alzheimers.gov. The website provides free information about Alzheimer's disease and related dementias. It provides links to authoritative, up-to-date information from agencies and organizations with expertise in Alzheimer's disease.

The recent failure of a phase III trial for bapineuzumab, a potential treatment for Alzheimer's being developed by Pfizer, Johnson & Johnson, and Elan, shows what a difficult task it is to prevent and treat Alzheimer's disease. Some say the fight to cure Alzheimer's disease is much harder than the fight to cure cancer.

Implications for the Life and Pension Risk Industry

These new resources and political focus on tackling geriatric dementia have significant implications for the life insurance industry. The biggest impact is likely to be on annuity liabilities. Current mortality improvements are being driven largely by erosion of premature mortality from cardiovascular disease. As other causes of death are reduced and people live longer, dementia will assume increasing importance as a geriatric disease, and will assume a greater proportional cause of older-age death. Treatments for reducing the prevalence of

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Alzheimer's will have a marked impact on the life expectancy of the pension population.

If treatments turn out to be expensive, we may see further polarization of life expectancy

between countries depending on their healthcare resources.

Enhanced and underwritten annuities will need to incorporate the potential for diseases that today appear incurable to become manageable.

PILLS FOR HEALTHY PEOPLE

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Many people already take daily aspirin as a heart drug, but the evidence that it also reduces cancer risk is becoming clearer.

Middle-aged people may soon be offered a range of pills for diseases they currently don't have but might be at risk of in the future. Preventative treatment of heart disease and cancer is being advocated using 'polypills', universal statin provision, daily low-dose aspirin and antihypertensives. This is triggering a significant debate in the U.K. healthcare industry about the value of preventative medicine and the willingness of the population to embrace it. Impacts on life expectancy could be significant for life insurers and for pension liabilities.

'Polypills' contain a cocktail of drugs that reduce risk factors for heart

disease. A recently published clinical trial showed that giving a polypill to the over-50s with no history of heart disease could significantly reduce their risk of a heart attack or stroke during their lifetime. The study suggests that 28% of subjects would benefit by avoiding or delaying heart disease, and on average, those who benefit would gain 11 years of life without a heart attack or stroke.

The trial was small, with only 84 participants, but adds to a growing body of evidence to support the use of polypills in preventing cardiovascular disease in healthy populations. The Wolfson Institute of Preventive Medicine at Barts and

The London School of Medicine & Dentistry study used a polypill combining three different types of drugs for lowering blood pressure, a calcium channel blocker, an angiotensin 11 receptor antagonist and diuretic, and a statin for lowering cholesterol.

It is well proven that statins prevent heart disease, but their net effects on people at low risk have been unclear. A separate recent study of randomized controlled trials of 175,000 people by Oxford University showed that statins reduced heart disease regardless of age, sex, baseline cholesterol levels, previous heart disease, and all-cause mortality. In particular, results showed that statins reduce the risk of a heart attack even in healthy people over 50. Current guidelines prescribe statins for high-risk individuals - those with a 20% chance of developing cardiovascular disease within 10 years, estimated from their risk factors such as age, blood pressure, cholesterol levels, smokers and diabetics. The study concluded that taking statins lowered the risk of heart disease by 21% across the healthy population, with very few side effects. This has

generated calls for the U.K. National Health Service (NHS) to extend the provision of statins to everyone over 50. This blanket provision would extend the number of people in the U.K. taking statins from around 5 million today to around 20 million. It would cost the NHS an estimated £240m (\$388m) but would be cheaper and easier to implement, saving £700 (\$1,100) per patient on screening, and overall would reduce the future healthcare costs of medical treatments for heart disease across the population. The National Institute for Health and Clinical Excellence that produces the guidelines for NHS treatment is reviewing the evidence.

In a third development, new studies published in the *Lancet* add to mounting evidence of the benefits in reducing cancer incidence for healthy people who take daily low dosage aspirin. Many people already take

daily aspirin as a heart drug, but the evidence that it also reduces cancer risk is becoming clearer.

These developments raise the significant issue of how many healthy people would take preventative drugs if they are not experiencing symptoms of disease. Current reaction to the debate has been mixed. There is a significant proportion of the population that is unwilling to take preventative drugs. There is significant concern about potential side effects and a reaction against any argument that is predicated on the good of the general population rather than a direct and demonstrable benefit to the individual. Like many other healthcare advances, the establishment of clear risk data and a gradual process of education and proving the benefits will be required before the main population adopts the practice.

Implications for the Life and Pension Risk Industry

The evidence is building that preventative medication is beneficial. Widespread taking of preventative medication could provide a major wave of increase in life expectancy across many of the life insurance and pension markets in Europe and North America. RMS is currently analyzing the potential impacts on the mortality rates of insured lives and for pension portfolio liabilities of different speeds of uptake in the population of preventative drugs of different types. Managers of mortality risk should be prepared for significant changes in future mortality patterns to emerge from this trend.

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HONG KONG WOMEN NOW HAVE WORLD'S LONGEST LIVES

Latest figures show women in Hong Kong surpassing women in Japan in terms of life expectancy. The life expectancy now for a woman in Hong Kong is 86.7 years, compared to a woman in Japan of 85.9. Reports show that life expectancy for women in Japan has declined from 86.3 years in 2010 to 85.9 in 2011. Japanese men's life expectancy also decreased, from 79.55 to 79.44.

Some of this is due to the March 2011 Tohoku earthquake and tsunami, which killed nearly 20,000 people in Japan, and contributed to pushing the statistics down. But even if deaths related to the disaster were not included, the life expectancies would still have been below those of Hong Kong, and would still have shown women's life expectancy declining, to 86.24 years.

Doctors say that Hong Kong women's longevity is due to rapidly improving healthier lifestyles and significant

increases in the resources and sophistication of medical services for the population. China managed to double its per capita spending on healthcare within three years, from 2007 to 2010.

Increased fish consumption has been linked to decreasing mortality from heart disease among the older population in Hong Kong. The high longevity ranking of Hong Kong may be related to diet, and the fact that Hong Kong is the largest importer of Japanese cuisine.

Regular exercise is also an integral element of a healthy lifestyle. The elderly in Hong Kong choose Tai Chi as a moderate popular form of exercise, renowned for its health effects, exemplified by groups of pensioners exercising in the parks in the morning, improving social functioning as well as physical health. Given that a fish diet is also good for cognitive functioning, the lifestyle of

Hong Kong citizens is more conducive to longevity than that followed in most western countries, and helps explain the significantly lower mortality rate in the former British colony.

Japan is second to the U.S. in terms of number of centenarians with a current population of about 30,000. However the number of centenarians has almost quadrupled in the last 10 years in Japan. Centenarians are increasing at a much faster rate in Japan when compared to other countries.

In proportion to its large population China does not have a high percentage of centenarians, about 7,000 officially in the last census. However Hong Kong is not like

the rest of China. The number of centenarians in Hong Kong was also increasing about four-folds from 289 in 1981 to 1,510 in 2006 for both genders. Over the last twenty-five years, the Hong Kong centenarians increased by nearly 7% per annum.

Implications for the Life and Pension Risk Industry

For a long time Japan has exemplified record longevity, with some of the longest population-level life expectancies. Mortality improvement has caused the 'rectangularization' of population mortality - i.e. pushing more of the population towards the limits of maximum age. Part of the debate around the science of longevity has been whether there

are physical limits to maximum biological age, or whether mortality improvement might push beyond currently observed maximum ages. The slowing of mortality improvement in Japanese populations is not yet a strong enough signal to be definitive, but it indicates more support for the idea that there might be limits to natural aging improvements, without medical treatments that intervene with the aging process. International patterns of mortality are of interest to international life insurers looking to expand into new markets. Understanding the different drivers of mortality change in different countries assists with managing diversification in international life portfolios.

MORE PENSIONERS THAN CHILDREN BY 2050

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By 2050, people over 60 will make up a fifth of the world's population, and more than a third in developed countries.

A startling United Nations report into global aging forecasts more pensioners than children by 2050, when the number of people over 60 will hit two billion. The number of centenarians will rise by an order of magnitude, to three million. The imbalance caused by reducing fertility and increasing longevity has significant societal implications, as well as for the financial services industry.

The aging of the population has been one of the most distinctive demographic characteristics of the past half century, and has been

experienced by most countries across the world. This is not just a rich-world phenomenon. For the foreseeable future, almost all countries will face increasing proportions of elderly in their populations. The new UN report on World Population Ageing 1950-2050 paints a disturbing picture of the dual impact of declining fertility rates and mortality improvement on the demographics of the future world.

The report projects that by 2050, the number of older persons in the world will exceed the number of young for the first time in history. This reversal in the relative proportions of young

and old was reached in the developed world by 1998. By 2050, people over 60 will make up a fifth of the world's population, and more than a third in developed countries.

A key metric is the potential support ratio (PSR) of people of working age (15-64) to pensioners (65 and older). The world's PSR has fallen from 12 in 1950 to around 8 today. By 2050 the PSR will be half that of today - below 4. Traditional public sector pension funding relies on taxation from the working population. Without a reformation of the system, the tax burden per worker to support retirees will effectively double.

Another consequence is that older people will have fewer kin on whom they can rely on for social support, which may have a significant effect on the well-being of the elderly. The report also points to the impact of increased numbers of people surviving to the oldest ages in triggering structural changes in the pension and health systems of the world. Profound impacts are expected

across a broad range of economic, political and social conditions, and raises doubts about the long-term viability of social support systems.

As the elderly become a greater proportion of the population, the causes of death are shifting. In most populations, the leading causes of death for all ages are cardiovascular disease (CVD) and cancer. There is however a different pattern of death in people above 90, where respiratory disease, mental health, and accidents together account for more than half of all deaths, with pneumonia as the leading single cause. One in three people over 95 have dementia, which greatly increases mortality from all causes. Disease mechanisms and risk factors that are well understood in

lower age populations appear to work very differently in the very elderly. Higher body mass confers survival advantage, rather than increasing mortality risk as it does in middle age. Elderly smokers have little additional risk compared to their non-smoking peers. Small amounts of exercise are extremely beneficial. Bone density and fat stores are significant in improving life expectancy. Some of the strongest factors affecting mortality risk in the elderly are cognitive function and general well-being, so social interaction and mental stimulation are critical to longevity.

Implications for the Life and Pension Risk Industry

The implication of the UN projections is that many of the future aged will

have fewer financial resources per person than the elderly enjoy today. Economic growth could offset this, but the likelihood is that state pension provision will have to undergo radical change. More emphasis is likely to be placed on private sector pension provision and personal saving plans. Personal finance and annuity provision will likely see unprecedented growth as individuals take increased responsibility for their own pensions. Insurers will need to manage their risk carefully as the patterns of mortality shift in the very different world of the future.

OTHER NEWS IN BRIEF

Innovative Anti-Smoking Campaigns in U.K. and U.S.

After decades of decline, the national smoking rate has stalled at around 20 percent in both the U.K. and the U.S. This has prompted new public health initiatives to bring it down further. Stoptober is a U.K. national mass quit attempt where smokers are being asked to give up smoking for a month. Earlier this year the U.S. government launched a \$54 million anti-tobacco campaign that features personal descriptions and pictures of mostly middle aged people who've suffered severe health effects from smoking. The results of both campaigns are being monitored with interest.

X-Prize for Genome of Centenarian

The X Prize competition in genomics will offer \$10 million to a team that can accurately and completely sequence the genomes of 100 people in 30 days at a cost below \$1,000 per genome. The 100 genomes will come from people who are at least 100 years old. It is hoped that unlocking genetic clues in people who live to 100 could advance the study

of why people age. Low-cost gene sequencing promises a new era of personalized medicine, yielding new approaches for treating cancers and other serious diseases. Experts predict that the cost of gene sequencing could eventually be as low as that of a blood test. Any data gleaned from the X Prize will be shared with other scientists in the field, to aid the quest for insights into aging.

Soda Bans for U.S. Health

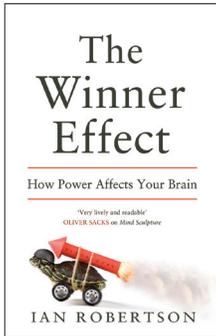
New York Mayor Michael Bloomberg passed a ban on large sodas in September 2012. The new law limits servings of sugary drinks to 16 ounces (473 ml) at most outlets. Many opponents view this as "nanny state" interference but supporters call it crucial to fighting obesity. It is no surprise that Coca-Cola Co has called the Bloomberg proposal an insult to New Yorkers, and the American Beverage Association, which represents that company as well as PepsiCo Inc and other soda makers, is also fighting the measure. According to the American Medical Association, sugar-sweetened drinks make up nearly half of Americans' added sugar

intake, and cutting consumption of these beverages is a simple way to reduce intake of sugar and empty calories. A leading U.S. cancer lobby group is urging the Surgeon General to conduct a sweeping study of the impact of sugar-sweetened beverages on consumer health, saying such drinks play major role in the nation's obesity crisis and require a U.S. action plan.

Obesity and Investment Opportunities

The global obesity epidemic is being recognized as an investment opportunity. The economics of obesity is far reaching. Globesity by Bank of America Merrill Lynch, describes the trends and WHO obesity statistics, and identifies four sectors of investment opportunity: Pharmaceuticals & Health Care; Food; Commercial Weight Loss, Diet Management & Nutrition; Sports Apparel and Equipment.

BOOK REVIEWS

**The Winner Effect**

Ian Robertson

June 2012, ISBN-10: 1408824736



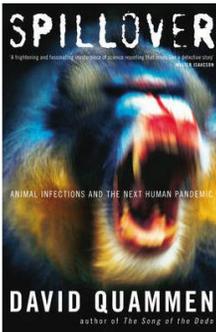
Ian Robertson, Neuroscientist and Professor of Psychology at Trinity College, Dublin, explores what makes a winner and why some succeed in life and business and others fail? In the recent London 2012 Olympics, Usain Bolt won the 100 meter and 200 meter sprints. What accounts for the fraction of seconds that Bolt can win by on a regular basis? The “winner effect” is a biology term used to describe how a fighter who wins initially some fights against weaker

opponents will go on to win later against stronger opponents. Success changes the chemistry of the brain. The more you win the more you go on to win.

Robertson includes a chapter on social status and how it affects life expectancy. Although more powerful people are richer, it is not just wealth that determines their longer lifespans. Nor are the effects completely accounted for by differences in

lifestyle risk factors. Robertson examines statistical studies that show that winners of Nobel prizes (100 or so of them that are trackable) live on average 2 years longer than the other 532 nominees who came close but didn't win. Another study suggests that Oscar winners live four years longer than their nominated peers who ended up similarly rich and nearly as famous but who didn't actually win. His main thesis is that high status individuals ('winners') have more security against the debilitating stress of other people's negative evaluations. He calls this a 'safety signal for self'. Winning an Oscar or a Nobel Prize provides a permanent safety signal.

This is a provocative book that suggests that future mortality trends of different socio-economic groups in a pension portfolio will depend on social hierarchical and psychological drivers, as much as physical and medical differentiators.

**Spillover**

Animal Infections and the Next Human Pandemic

David Quammen

October 2012, ISBN-10: 0393066800



In 1994, race horses in Australia suddenly began dying of a mysterious disease. Their trainer also became very sick and died. Scientists isolated a new virus which they named Hendra after the town where it was first discovered. The virus was eventually tracked to bats. How long had the virus been in the environment and what caused it to jump species from animals to humans?

This new book by science writer David Quammen investigates spillovers of zoonoses—animal infections that become transmissible to humans—and how and why they occur. Quammen

chronicles his encounters with doctors, scientists, field researchers, and survivors of diseases he tracked around the world, including Hendra, Ebola, Q fever, SARS, Lyme disease, and AIDS. He explores what could cause the next big pandemic and the role of humans in spillover events. The subject is a timely one, as it explores one of the largest current potential threats to humankind. Recent 2012 headlines have included spillovers like the ones described in the book: human cases of the deadly hantavirus in Yosemite National Park, and the discovery of a new coronavirus that

has killed 2 people in Saudi Arabia and Qatar.

Evidence of Quammen's wry humor and eco-centric perspective are sprinkled throughout the book. In describing an outbreak of the Ebola Reston virus in sick macaque monkeys, he writes: “One animal died and, after it tested positive for Reston virus, forty-nine others were euthanized as a precaution... Ten employees were screened for infection, and they also tested negative, but none of them were euthanized.” Quammen is a compelling storyteller and his writing focuses on the people and the stories behind the pathogens, but that doesn't mean his research lacks scientific rigor. Despite the fact that he is almost apologetic about getting overly technical or mathematical at times, he maintains a zeal for multi-disciplinary scientific research. Infectious disease experts and non-scientists alike will learn something new from his highly relevant book and enjoy the experience of reading it at the same time.

RMS Seminars

RMS will host its latest RMS Bio.nomics - A LifeRisks Seminar titled Making a Market for Longevity Risk Transfer for clients at The Harvard Club, New York on Wednesday, January 30th, 2013.

RISK MANAGEMENT SOLUTIONS FOR THE LIFE & HEALTH INSURANCE INDUSTRY

Risk Management Solutions (RMS) applies the latest science in analytical tools for making risk management decisions in the life and health insurance industry, including management of excess mortality and longevity risk.

RMS provides RMS LifeRisks™, a modeling platform for the life insurance and pension risk management industry. RMS LifeRisks enables companies to assess an integrated view of trend and shock risks into their life and annuity portfolios that is underpinned by detailed medical research and social change projections RMS Models.

RMS models include probabilistic stochastic simulation of mortality shocks arising from influenza pandemic, emerging infectious diseases, terrorism mass mortality and group life concentration risk analysis, natural catastrophes and other sources of mass mortality. RMS also provides a longevity risk model comprising probabilistic stochastic models of mortality improvement scenarios. RMS models are designed to provide holistic assessments of mortality risk to enable diversification benefits, risk capital hedging between mortality and longevity risks, and other analyses to be quantified.

RMS produces excess mortality coverage for most countries with significant life insurance markets. RMS Longevity Risk models are available

for United States, United Kingdom, Canada, Netherlands, France and Germany.

Consultancy Services

RMS provides consulting services to help clients across many areas of risk management. Projects include economic capital requirements, Solvency II internal model calibration and approval, insurance product design, risk transfer and de-risking strategies, and reinsurance optimization. RMS acts as Modeling Agent on capital market transactions. RMS has provided risk management services for a number of the leading life and pension insurers worldwide.

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Publications

*RMS Launches New Platform for Life Insurance and Pension Risk Analysis
Mortality-Driven Risks:*

Calculating Capital Requirements for Solvency II

Managing Influenza Pandemic Risk, Risk Management Solutions Inc., 2007

RMS Pandemic Influenza Model Overview factsheet, 2007

For more information and publications visit www.rms.com/LifeRisks.

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ABOUT RMS

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