No Easy Way Out: An Overview of International Trends in Suicide

By Sara Goldberg, Gen Re, Cologne

Demographers commonly attribute past and projected mortality improvements to advances in medicine, increased health awareness and disease prevention. Since 1950, we have seen over 85% improvement to infant mortality in the developed world and over 70% improvement to age-standardised cardiovascular mortality in the US. In contrast suicide rates remain stubbornly high and even increased in some countries. The current annual global toll from suicide is nearly one million deaths, the third leading cause of death in ages under 45.1 While medical research has driven improvements in challenging clinical fields – HIV and breast cancer treatment serve as examples – similar work has not proved capable of mitigating suicide.

Suicide prevention and risk detection efforts have fallen short due in large part to a lack of awareness of serious depressive illness, especially when coupled with existing social and cultural stigma that blights open discussion of its impact. Unlike most illnesses where patients exhibit a strong will to avoid mortality – to beat cancer, to fight infection – the will in those at risk of suicide takes a fundamentally opposite tack. This article explores the background to the persisting trends in suicide, its drivers and exacerbation by economic uncertainty, and considers what steps insurers may take to protect themselves from the impact of claims.

Introduction to drivers

An analysis of the “causes of causes” of death, though difficult to ascertain, may clarify whether mortality triggers are stable, poised for improvement or deterioration or, more specifically, linked to the economy. A Japanese study found a strong economy was positively correlated with heart disease mortality and transport accidents, but uncorrelated in stroke and negatively correlated with suicide.2 Meta-analysis reveals differing findings on the correlation between economy and cause of death trends, but suicide is the one cause uniformly agreed as inversely correlated with a good economy.3,4,5

Suicide has multiple drivers, including underlying clinical depression and mental disorders whose long-term prevalence (detected or not) should be fairly stable over time. Greenland’s disturbing suicide rate is perhaps partly a function of its geography – higher general rates of depression with seasonal suicide peaks in the permanent daylight of the summer months – which would not be expected to change...
Variation and trends

The precise drivers of suicide tend to be age-specific. For example, copycat behaviour and social pressure are commonly identified in younger suicides. Pressure to maintain financial stability disproportionately impacts vulnerable males in middle age. Concerns over losing independence or becoming a financial or care burden prompt suicide at older ages.

In fact, weakening social integration and erosion of the traditional support base for the elderly are trends implicated in suicides by South Korean men over age 80, which have more than doubled in the decade preceding 2011, exceeding rates of two per mille. Accordingly, South Korea has recently surpassed Japan in suicide rates, and the Korean insurance industry has seen corresponding increases in suicide claims, from KRW 56.2 billion in 2006 to KRW 165 billion in 2010. Despite the existence of such patterns, suicide risk remains extremely difficult for life underwriters to identify and nearly as impossible to predict, much less prevent, as it was a century ago.

Figure 1 provides an overview of male suicide trends in selected countries. Among the countries featured in the graph, Hungary and Switzerland exhibit promising trends, but they are alone here in showing steady improvements. It depicts male trends only; as a rule, male rates are higher than female rates globally. China (not pictured due to conflicting data), where the female rate is as much as three times higher, is a notable exception to this rule. The rate in China – reported to be among the highest in the world – is partially driven by high numbers of rural suicides, which affect life insurers to a lesser extent. One phenomenon that may impact insurers in neighboring markets, however, is the purchase by affluent Mainland Chinese of

Ironically, increased awareness can prompt an increase in suicide levels. Before the Jonestown cult mass-suicide of 1978, Guyana enjoyed a low incidence (in common with other South American countries) but ever since, the suicide rate has continued to climb – predominantly in the youth – and is currently the highest in the Western Hemisphere. This trend may have initially been the mark of copycat suicide, stemming from “awareness” drawn from media coverage. Another rationale could be the increased availability of agricultural pesticides in Guyana – limiting supply of similar chemical agents has been discussed in South Africa and China where they have long been a major contributor to suicide deaths. Theoretically, constricting supply is not effective prevention if demand still exists, as means (supply) will eventually be replaced. However, limiting or even removing easy access to poisonous agents has been proven to reduce suicide. Restrictions on Paracetamol sales and the prescription of less toxic antidepressants have had a positive impact. In the United Kingdom, self-poisoning with carbon monoxide accounted for nearly half of all suicide deaths before domestic coal gas was phased out in favor of harmless natural gas in the 1960s, after which the suicide rate fell by nearly one-third permanently.
policies with high benefits available in Hong Kong and elsewhere. There are many reasons to purchase a policy overseas, but one might be moral hazard and, among other things, cross-border claims investigations can be futile.

Suicide rates increased so sharply in the 1990s following the monetary and political upheaval in Russia, and an economic slowdown in Japan, that aggregate mortality among young males in those two countries experienced a rare deterioration in the decade. A major Japanese insurer reported that 10% of all life claims in one year were suicides – this alone would eliminate margins for many insurers. In both countries, but particularly Japan with its high insurance penetration, suicide can exert a major effect on overall insured mortality trends and can be over-represented in claims, depending on the age range and duration of product sold.

Japanese men have suicide rates twice those of women, though it is increasingly a factor of death in young females. Numbers doubled for males in all ages since the 1970s with a spike starting in 1997. Due to the age shape of mortality curves, most deaths take place in high ages where suicide is a low contributing factor; in ages 0-84 alone, over 90% of deaths occur in ages 50+ where the contribution of suicide as cause-of-death appears to be around 3%. In younger age groups, suicides officially account for up to 40% of deaths in Japan, though the actual figure is perhaps higher.14 A recent study found that age-standardised mortality rates substantially declined from 1980 to 2005 for Japanese males who were either unemployed or in all occupations except management and professional workers. Mortality rates for male management and professionals in Japan began to increase in the late 1990s alongside sharp increases in suicide rates.15 These concerning trends are believed to be correlated with the stagnation of Japan’s economy, and this occupational cohort is exactly the group to whom insurers are most financially susceptible.

Russia and other ex-Soviet member states experienced similar peaks in aggregate mortality, in large part driven by suicide spikes in middle-aged men. Much of this is reported to be alcohol- and depression-induced and has tapered off since, but these states still have among the highest suicide rates in the world – Russia alone has lost 600,000 to suicide in the 10-year period after hyperinflation and removal of Soviet price controls. These histories of Russia and Japan may have stabilised, but the correlations between suicide and economic instability there prove as insightful backdrop to recent sharp increases in Greece, Italy and Ireland – all countries with historically low suicide rates.16,17

The global financial crisis coincided with a reversal of downward trends in 2008 and 2009 in both European and North American countries.18,19 The latest available data indicates stabilization in some EU countries in 2010 but continued deterioration in others.20 Though the US suicide rate still trails most of East Asia and Eastern Europe, recession since 2008 has also been linked to the dramatic increase in US suicides. They also have a disturbingly high suicide rate amongst veterans, with approximately 9% of the US population being veterans but over 18% of suicides stemming from veterans. Puzzlingly, many were never deployed and cannot be solely attributable to post traumatic stress disorder.21 These factors are temporal, arguably circumstantial and preventable with a better social care and health resource safety net, all of which depend on an economy able and willing to support it.22,23

While suicide prevention measures are often targeted at younger people and seniors, males aged 35-64 in the US have seen the highest trends, yet there is little targeted prevention for this age range.24,25 A trend in this age range has a material impact on insurers, especially where their baseline mortality in that age group has fallen to well below one per mille in its actuarial nonsmoker table at issue age.26 Suicides have never comprised the leading cause of death in any country or age group in the long run, but they are on the rise in certain areas. Prevention and awareness are public health concerns that go well beyond the scope of insurance; community vigilance and government initiatives can limit a recession’s disturbing consequences.27

**Action for insurers?**

In the meantime, with economic uncertainty persisting in various markets, what can insurers do to mitigate this high-persisting suicide rate? A close look at loadings on mental health history, continued development of more accurate ways to detect and assess suicide threats, and strong financial underwriting are essential at high
insured sums. Yet given the extreme difficulty in underwriting for suicide risk and subtleties encountered at claims stage, which is discussed elsewhere in this issue of Risk Insights, options for insurers are limited. 28

A blunt but common method of managing suicide risk is for policy wording to simply exclude suicide from coverage. With death benefits, most markets apply a one-to-three-year exclusion period. For suicides that are triggered by personal events or circumstances, do these subside by the end of the exclusion period? If suicide is driven by sudden loss of job, income or a stock market crash, for example, many claims may be avoided with a one-year exclusion and even more so with a three-year exclusion. As for changes in family structure, lack of support structure in older age, poor longer-term financial outlook or inability to provide for the next generation (often cited in Korea and Japan), suicide may be premeditated over a longer time with action deferred until any exclusion period has expired. Accordingly, some insurers and regulators are currently considering increasing exclusion periods in the wave of deteriorating claims experience.

It is also noteworthy that the attempted suicide rate is much higher than the completed rate – estimates range from a multiple of 10 to 40 times the completed rate. 29 This would have a considerable impact on living benefits – medical reimbursement, disability and critical illness insurance – so self-inflicted injury is typically excluded from the living benefits.

What data do we have on the effect of an exclusion period, and whether suicides are avoided or simply paid out as accidents or other causes instead? Data from the Society of Actuaries in the US concludes there was a quadruple increase in suicides at the end of the exclusion period (typically two years in the US) and that during the exclusion period, a number of “disguised” suicides come through in higher accidental death rate. 30 There is differing evidence in other countries, such as Japan and Australia, on what portion of suicides are simply delayed (pent-up “demand”) versus avoided, and whether they too are disguised as accidents. 31,32

Most evidence points towards the theory that moral hazard does exist in this area – that those who take out higher insured sums are more likely to commit suicide, and that a longer exclusion period reduces a significant portion of the anti-selection.

Since the start of the suicide epidemic in Japan, life insurers increased the exclusion period gradually from one year to three years by 2005. Germanic countries also have a three-year standard. Some UK insurers have reintroduced one-year clauses but these remain inactive if a policy is assigned to a lender. Other markets tend towards a zero- to two-year exclusion period; for example, China’s standard is two years while Hong Kong’s is typically only one year. Belgian and Greek insurers denied benefits for suicide altogether until implementing a two-year exclusion in the 1990s.

One flaw is that the longer the exclusion period, the more tempted the vulnerable might be to disguise suicide as an accident – perhaps one reason why the US sees an accident spike but Australia, with a 13-month period, does not. Increasing it to three years, or even longer, might pose difficulties in claims management – in deciding when to pay for an unexplainable traffic fatality, for example. In addition, death certificates and coroner’s reports frequently omit “suicide” as the cause; while police reports that could assist, frequently do not exist. Table 1 shows the distribution of mortality from external causes in males for selected countries.

<table>
<thead>
<tr>
<th>Country (Year)</th>
<th>All external, per mille</th>
<th>Suicide</th>
<th>Transport accidents</th>
<th>Falls</th>
<th>Drowning &amp; Fire</th>
<th>Accidental Poisoning</th>
<th>Assault</th>
<th>Other external</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hungary (2009)</td>
<td>1.02</td>
<td>39%</td>
<td>17%</td>
<td>21%</td>
<td>3%</td>
<td>2%</td>
<td>2%</td>
<td>0%</td>
</tr>
<tr>
<td>Japan (2009)</td>
<td>0.88</td>
<td>46%</td>
<td>10%</td>
<td>9%</td>
<td>7%</td>
<td>2%</td>
<td>1%</td>
<td>1%</td>
</tr>
<tr>
<td>Russia (2009)</td>
<td>2.64</td>
<td>18%</td>
<td>13%</td>
<td>4%</td>
<td>5%</td>
<td>4%</td>
<td>17%</td>
<td>9%</td>
</tr>
<tr>
<td>South Korea (2009)</td>
<td>0.88</td>
<td>45%</td>
<td>24%</td>
<td>7%</td>
<td>2%</td>
<td>1%</td>
<td>1%</td>
<td>2%</td>
</tr>
<tr>
<td>UK (2009)</td>
<td>0.41</td>
<td>26%</td>
<td>13%</td>
<td>18%</td>
<td>2%</td>
<td>1%</td>
<td>11%</td>
<td>1%</td>
</tr>
<tr>
<td>US (2007)</td>
<td>0.85</td>
<td>22%</td>
<td>26%</td>
<td>9%</td>
<td>2%</td>
<td>2%</td>
<td>16%</td>
<td>11%</td>
</tr>
</tbody>
</table>
Although interesting, the numbers depend on the death certificates being coded correctly.

Aside from claims management complications, lengthening the exclusion period or denying benefits to an estate in the instance of suicide can cause undue trauma to family members and poses a reputational risk for insurers.

A possible alternative to a long exclusion period, and one that takes due consideration of moral hazard — particularly with reference to US data, which boasts some quite high insured sums, up to 60% higher average sums on suicide claims than other claims — is to cap benefit. For instance, suicides or accidents during the exclusion period receive a maximum payment of the lower of $500,000 or 75% of the purchased face amount. It is admittedly important to strike a balance between simplicity and clarity of terms and protection against moral hazard.

The insurance industry can raise awareness and help, but society also needs to play its part. Discounting the impact of any cultural or geographic differences, all suicide is usually at least partly circumstantial and triggered by a life event. This may include redundancy or loss of financial, family or political stability, and is exacerbated by health systems with a weak safety net to accommodate them.

We have come a long way from the times when attempted suicides were treated medically with buckets of cold water thrown at the head; there is now much better awareness and treatment of clinical depression, one of the key underlying factors. Yet far too many suicides are attempted and completed each year, and no one can afford to ignore the persisting trends seen in suicide rates.

### Endnotes

1. N.B.: Source for all suicide statistics unless stated otherwise stems from the WHO mortality database and their mental health statistics.
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### About the Author

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Suicide – Right To Die, Wrong To Claim?

By Ross Campbell, Gen Re, London

The concept of suicide has never been a simple one to define. The term encapsulates a wide variety of individual circumstances and moral and religious perspectives, in addition to potentially problematic legal definitions. The insurance industry has been engaged largely through claims with the latter issue, but the rise of two phenomena prompts a re-examination of the industry’s response when someone takes his or her life; one is the rise in assisted suicide; the other is the recent worsening of suicide trends in much of the world – a phenomenon brought about by the worldwide economic crisis.

The relationship between assisted suicide and the law is not a new one. In ancient Greece, those who wished to die by their own hand received official permission – and poison – from authorities only after successfully petitioning magistrates in the senate.

Throughout history, the subject of suicide has sparked debate on legal, ethical, cultural and religious grounds. Euthanasia is a wide term that describes the intentional ending of a person’s life, yet it too has shades of meaning and differing legal definitions depending on context.

Legislation covering assisted suicide and euthanasia varies. In some regions, notably the Middle East, it is prohibited in all forms. In Benelux countries as well as some US states, legal code allows (active) physician-assisted suicide (PAS). In Switzerland, where (passive) non-physician-assisted suicide (NPAS) has been legal for over 60 years, any mentally competent person has the right to obtain a lethal substance – which must be taken without external assistance – to end his or her life.

This article considers the role of NPAS within suicide death, and the complex issues that this grey area raises for claims managers.

Assisted death – A moral maze?

If a television documentary depicts an animal dying of thirst on a drought-ravaged savannah, some ask if human help could not have saved the creature. Of course, while difficult to watch, our intervention would work against the natural order of things. Conversely, we operate on a moral obligation to relieve the suffering and respect the dignity of our fellow human beings.

Modern medicine provides effective treatment for conditions that were previously fatal, allowing lives to be prolonged. An unexpected, sometimes unwelcome, outcome is that life is sustained in individuals with physical and mental incapacities that cannot be fixed – people whose irreversible degenerating condition causes them unquenchable pain, discomfort and indignity. While the work of doctors postpones death for many, some hopeless patients desire only a merciful exit from a life they feel has been destroyed by illness and is therefore beyond repair.

Suicide statistics are an indicator of mental health norms, yet some choose suicide for reasons unrelated to any psychiatric condition. For those locked within the terminal stages of a severely disabling disease and suffering a compromised quality of life, assisted suicide is a rational option to avoid prolonged suffering.

Table 1 – Euthanasia classification

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Active</td>
<td>Where a person deliberately intervenes to end someone’s life; for example, by injecting him or her with sedatives</td>
</tr>
<tr>
<td>Passive</td>
<td>Where a person causes death by withholding or withdrawing treatment that is necessary to maintain life</td>
</tr>
<tr>
<td>Voluntary</td>
<td>Where a person makes a conscious decision to die and asks for help to do this</td>
</tr>
<tr>
<td>Non-voluntary</td>
<td>Where a person is unable to give consent and another person makes the decision on their behalf, often because the ill person previously expressed a wish for his or her life to be ended in such circumstances</td>
</tr>
<tr>
<td>Involuntary</td>
<td>Where a person is killed against his or her expressed wishes</td>
</tr>
</tbody>
</table>
The case for assisted suicide appeals powerfully to notions of compassion and self-determination, yet the choice to end a life involves complex moral decisions. A wish to commit suicide by medical means, perhaps on receiving a devastating diagnosis, may be clear when the person voluntarily, and independently, decides to overdose with the intention of dying from it. The wish is much less clear when assistance has been required to complete the task – when the person, while mentally competent, was physically unable to carry out that final wish in a dignified manner without help from others.

There is a tension between a moral right to freely choose self-destruction and the possible end-point for a society that actively supports this behaviour in persons who lack the physical or mental capacity to carry it through without assistance. Van der Maas discussed this tension, asking if accepting a request for assisted suicide from a terminally ill yet mentally competent patient represented a first step toward an unintended and undesirable increase in the number of less careful end-of-life decisions and to gradual social acceptance of suicide that could be assisted for morally unacceptable reasons.3

A poll of UK doctors found the majority opposed official introduction of both active voluntary euthanasia and physician-assisted suicide. Setting aside religious objections, their concerns were the impact these introductions might have on effective palliative care, how adequate safeguards would be introduced, and the growth of a non-medical “facilitating profession”.4 The latter concern hints at the fee-based services provided by private clinics, and it is assisted suicide at such facilities that create uncertainty for claims managers.

### Assisted death – The facts

The UK National Health Service defines euthanasia as the act of deliberately ending a person’s life to relieve suffering, and uses the example of a doctor giving a fatal dose of muscle relaxants to a terminal cancer patient in order to end their life (see Table 1).1 The line dividing PAS as euthanasia from the more common and less controversial practice of palliative sedation is often blurred.

In the Netherlands, where it has been allowed, under strict conditions regulated by law since 2002, PAS is defined as the administering of lethal drugs by a doctor, on a patient’s explicit request with the intention of ending life. In 2010 reported cases totalled 3,136 or 2.3 per 1000 deaths.

Fewer than half of patient requests have been granted by doctors, which provides some reassurance that widespread abuse, or disproportionate use in vulnerable populations, has not occurred.4 The most common reasons to grant requests included no prospect of improvement, no further treatment options are available, or loss of dignity.

In Belgium, where active euthanasia has been legal for a decade, the share of reported deaths by euthanasia hit 7.9 per 1000 deaths in 2009. The underlying diseases were cancer (44% of cases), neurological degenerative disease (19%), cardiovascular disease (9%) and musculoskeletal disorders (6%). Other concomitant conditions included diabetes, blindness and lung disease. Depression was recorded in just 3% of cases, underlining the need for the subject to be of sound mind.

In contrast to the Belgian figures, the 300 NPAS deaths recorded in Switzerland during the same year represented 4.8 per 1000 deaths.7 NPAS represented 27% of all suicides by Swiss nationals. DIGNITAS, a Swiss-based company, provides members an “accompanied suicide” when they have a terminal illness, and or unendurable incapacitating disability and or unbearable, uncontrollable pain. To go through with the service, a member must be of sound mind and possess a minimum level of physical mobility sufficient to self-administer a fatal dose of Sodium Pentobarbital. The drug may be swallowed, taken through a gastric tube or administered intravenously. To meet legal requirements, the person must be able to undertake this final act without help. The cost of the service is not inconsequential. In addition to membership fees, the company requires payment of £7,500 up front to cover administrative costs, physician fees and funeral expenses – and without any guarantee of suicide occurring.8 DIGNITAS data from 1998 to 2012 reveals almost 1,500 people from more than 30 countries have exercised their right while 6,500 more from 80 countries are active members.9
Paying Assisted Death Claims – A UK Perspective

By Claire Henshall, Gen Re, London

It is important to understand the difference between suicide and assisted suicide in the claims context. A death claim is payable when a policyholder takes his or her own life, even when this represents a rational decision, and there is no operable suicide exclusion in place. The claim would also be payable when a doctor opts to withdraw treatment, after discussion with the patient and family, in what is essentially physician-assisted euthanasia. The position is far less clear where the individual committing suicide is unable to do so without assistance from another person.

There is much debate about the regulation of assisted suicide but in the UK the law is quite clear. Suicide is not in itself an offence — although there are jurisdictions where this is not the case — but helping a person to commit suicide is. To bring a prosecution, an assistant who “aids, counsels or procures” the suicide of another must be proved to have acted in an intentional way and that his or her actions were capable of helping that person to die. This applies as much to a member of the medical profession as any other individual. While this applies within the UK, the possibility of prosecution extends even when the act itself takes place in a jurisdiction where assisted suicide is legal, such as Switzerland.

The conundrum for insurers stems from the tension between the general tenet that a beneficiary of an insurance policy cannot gain benefit as a result of an illegal act and the compassion of the act itself. As such, should a death claim be paid when the policy beneficiary assisted in the suicide, however compassionate the act may have been and however soon after the policyholder might have died regardless?

UK law did not foresee assisted suicide as an act of compassion. Present policy recognises circumstances where a prosecution is not appropriate, while protecting the vulnerable from those that may gain from assisting their suicide. In 2010 new guidance set out public interest factors to determine the prosecution of those involved in assisting suicide.\(^1\) At the same time, the Suicide Act was amended to make it essential that prosecutors identify the timing of the assistance alleged to support bringing a criminal charge. In 2012 the Commission on Assisted Dying concluded that a new legal framework is needed to clarify the current “inadequate and incoherent” legal status of assisted suicide.\(^2\) In further evidence of the shifting sands that surround this subject, since January 2013 UK doctors have no longer faced disciplinary action for giving patients copies of medical records to support assisted suicide.\(^3\)

While assisting suicide remains a crime in the UK, an individual — either a partner or close relative within the context of a long-term and supportive relationship — who helped a loved one die is unlikely to face prosecution when the assistance was wholly motivated by compassion and when the actions were of only minor assistance or influence. In the absence of a compelling case of compassion, prosecution is more likely, especially if it is suspected the assistant stood to gain in some way — financially, for example — from the death.

Where euthanasia and assisted suicide are illegal, either could, depending on the circumstances, be seen as manslaughter or even murder and thus punishable with imprisonment. In areas that allow euthanasia and assisted suicide, it is only legal if the deceased had made an active and voluntary request to end his or her life. In addition, to make such an informed decision in the first place, the policyholder must have sufficient mental capacity to use and understand information. It should also be agreed that he or she has unbearable suffering with no prospect for improvement.

When considering a claim in which the policyholder may have been assisted in the suicide, the evidence sought should support the view that natural death would have occurred soon and within the policy term. A written statement of intent from the deceased had made an active and voluntary request to end his or her life. In addition, to make such an informed decision in the first place, the policyholder must have sufficient mental capacity to use and understand information. It should also be agreed that he or she has unbearable suffering with no prospect for improvement.

When considering a claim in which the policyholder may have been assisted in the suicide, the evidence sought should support the view that natural death would have occurred soon and within the policy term. A written statement of intent from the deceased would also be considered supportive evidence. The claimant may have used an Advance Medical Directive (AMD) — a legal document known also as a living will or a health care proxy, which is legally binding, provided the policyholder can understand the consequences and has signed it voluntarily without the influence of someone else. The AMD allows a policyholder to
convey his or her decisions about end-of-life care should that individual be unable to do so for him or herself. Issues covered by an AMD include use of life-sustaining medical equipment, tube feeding, resuscitation, and withholding food and fluid. However, an AMD does not provide for euthanasia or assisted suicide.

Clarity in the policy about what constitutes a valid claim, and what evidence is required to support that claim, would reduce pressure on claims managers who may otherwise feel compelled to contrive impromptu criteria and bring their own sincerely held beliefs to a claim – about appropriateness, for example – which could be avoided if the parameters are clear.

### About the Author

**Claire Henshall** graduated from the University of Cape Town with a masters degree in occupational therapy. She worked for 10 years as a rehabilitation expert in a number of clinical settings both in the UK and South Africa. Claire joined Gen Re South Africa as the Technical Claims Manager in 2002 where her responsibilities included the assessment and ongoing management of all claims. In April 2009 she joined Gen Re’s London office as Head of Claims. Claire can be reached at Tel. +44 20 7426 1806 or at claire.henshall@genre.com.

### Endnotes


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### The bigger picture – Rational suicide and claims

Data suggests that PAS occurs where life expectancy is short, measured in weeks. The implication is the impact is low in a death claims context. In contrast, people must decide when the time is right to act because they must have the physical ability to self-administer the fatal dose. In consequence, whilst terminally ill, these people are likely to be shortening their lives significantly.

However, the numbers of PAS and NPAS deaths are small when compared with those who make a rational decision to take their own life without any help. Globally, nearly one million people die from suicide each year. Depression is linked with the impact of poverty, debt, social problems, national austerity programmes and unemployment. People with risk factors for suicide because of mental illness are at greater risk of unemployment. Over half of people who die by suicide have had depressive symptoms at the time of death.

After the 2008 worldwide economic crisis, rates of suicide increased in Europe and America, particularly in men and in countries with higher levels of job loss. UK data, released in early 2013, revealed a significant rise in deaths from suicide over recent years following decades of rates trending downward (see Table 2). There is evidence linking the increase to the crisis.

### Table 2 – Annual UK suicide rates in 2001, 2006 and 2011

<table>
<thead>
<tr>
<th>Year</th>
<th>Deaths</th>
<th>Rate per 100,000 people</th>
</tr>
</thead>
<tbody>
<tr>
<td>2001</td>
<td>5932</td>
<td>12.4</td>
</tr>
<tr>
<td>2006</td>
<td>5554</td>
<td>11.3</td>
</tr>
<tr>
<td>2011</td>
<td>6045</td>
<td>11.8</td>
</tr>
</tbody>
</table>

*Source: Office for National Statistics*

The trend has prompted a review of the use of suicide exclusion clauses, a common feature of insurance policies but not universally applied in all markets. Typically, the exclusion prevents a claim during the first policy year. The intention is to deter a person buying insurance with the premeditation of killing him or herself as an altruistic act for the financial benefit of the family or business. However, if a person who is healthy at the time of application...
later develops a psychotic depression that drives him or her to suicide, is this in any way different to dying from an unforeseen heart attack? With no relevant medical history, neither represents a legally capacitous choice to end life and, as both are illnesses in a very biological sense can excluding a mental cause be justified?

Wording an exclusion that can provide meaningful protection against possible anti-selection is also problematic, and perhaps destined to become more so, given the surge in PAS and NPAS. A wording should reflect acts of commission and omission; for example, refusing medication or sustenance to stay alive. Exclusions can be difficult to enforce in any but the most clear-cut circumstances where intent is obvious and agreed by a coroner.

It seems likely that claims will arise in future where suicide was the cause of death. Claims managers must be ready to work through the maze toward a decision that takes account of the individual circumstances of a case. Insurance companies must explore, and clearly articulate their stance, towards different ways and circumstances in which people take their own lives. Merely having a blanket approach to suicide across the board is no longer a defensible position given the complexities of the issue.

Endnotes
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2 Oregon, Washington and Montana.
5 http://www.nhs.uk/conditions/.
10 Ibid Onwuteaka-Philipsen, B.
South African Group Mortality Experience

By Louis Rossouw, Gen Re, Cape Town and John-Craig Clur, Lecturer at the University of Cape Town

The group market in South Africa is well-developed and competitive. This article provides an overview of an analysis of the South African group mortality experience.1,2 This analysis, the first of its kind in this market, was conducted by Gen Re in collaboration with Professor Rob Dorrington and John-Craig Clur of the University of Cape Town.

The document covers the background of the market, how the data was analysed and the key results of this analysis. We also cover interesting methodologies developed to model the results, taking into account the HIV/AIDS epidemic in South Africa.

The employer-based group insurance market in South Africa is well-developed, characterised by complicated practices and highly competitive; however, it has not been well researched. Gen Re has slowly been attempting to improve on this situation. In previous work by Gen Re authors, who produced a general overview of the group market, the key features of the South African group market were:1

- The market is based on employer-based group with mainly compulsory benefits for employees.
- Death and disability benefits (both lump sum and income) form the major benefits offered in this market.
- The market is dominated by 12 insurance companies, with the four largest accounting for about 70% of the market.
- Pricing is based on technical (or “book”) rates as well as for groups larger than 200. Generally the market also allows on a credibility-weighted basis for the experience of the individual schemes.
- This work identified the problems associated with verifying the technical mortality bases used in group pricing.

South Africa is also in a process of social security reform; the Actuarial Society of South Africa is engaged in the process and assisting where possible. One aspect of retirement reform that will be important in this process is assumptions around the mortality of employed lives.

Given this background, research was undertaken to improve the understanding of the mortality experience of the group insurance market.

Data

The data collected was submitted by six South African life insurance companies:

- Sanlam
- Old Mutual
- Momentum
- Metropolitan
- Liberty
- Capital Alliance

Key features of the data collected included the following:

- Data was for employer-based compulsory group life insurance.
- Data covered the period from January 2005 to December 2009.
- Data covered employed members of the workforce and therefore includes only lives that are in reasonably good health and excludes unemployed and informally employed. It also excludes retired members (including members who retired due to ill health).
- Disabled members may still be present due to groups continuing to offer group life cover to members receiving disability income from the group.
- Data contained information on the age, gender, salaries and benefits of individual members. It also contained information on the industry and location (province) of the employer for each particular group.

Various checks and adjustments needed to be made to the data:

- Completeness of all variables was checked. Missing values needed to be adjusted as individual records with missing data could not be excluded. Where a particular group’s data was of low quality, the whole group was excluded.
• Salary data had to be inflated to January 2010 values. Salaries were also banded as per Table 1. Unrealistic salaries were investigated and corrected where needed.

• Industry data from various companies was first mapped to a common categorisation labelled A-E. This was further grouped, as per Table 2.

Table 1 – Annual Salary Bands

<table>
<thead>
<tr>
<th>Salary band</th>
<th>Range (R)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Less than 40,000</td>
</tr>
<tr>
<td>2</td>
<td>40,000 to 69,999</td>
</tr>
<tr>
<td>3</td>
<td>70,000 to 124,999</td>
</tr>
<tr>
<td>4</td>
<td>125,000 to 249,999</td>
</tr>
<tr>
<td>5</td>
<td>From 250,000 upwards</td>
</tr>
</tbody>
</table>

Late reporting of claims

Because claims are reported after delays, allowance was needed for late reporting. Individual life insurance companies also had different delay times. Late reported claims were allowed for, based on claims development factors derived from a simple numbers-based basic chain-ladder for each company. Actual claims were then grossed-up, using the derived development factors. Table 3 summarises the completeness of reporting by calendar year.

Results

The analysis produced many interesting results. This section discusses some of the crude mortality results, which refer to mortality results before modelling, as well as the modelling approach.

When comparing the crude mortality rates, one has to take account of variations in other factors between the two groups being compared. In this case we are comparing the mortality of males and females. However, the average age of the females (38.7) is almost two years younger than the average age of males (40.6). Also, the average salary for females was approximately 18% lower. Both of these factors have an impact on mortality, so the crude mortality rates were standardised to take account for them.

Figure 1 shows some clear trends. Mortality rates for females are consistently lower than for males, as is generally expected; also increasing salaries are correlated with lower mortality. The average combined mortality in the lowest salary band is approximately six times that of the highest salary band.

Table 2 – Industry Mappings

<table>
<thead>
<tr>
<th>Industry group</th>
<th>Overall description</th>
<th>Description of component industries</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>light</td>
<td>financial services, business administration</td>
</tr>
<tr>
<td>B</td>
<td>light</td>
<td>other services such as retail, education, health and IT</td>
</tr>
<tr>
<td>C</td>
<td>mid</td>
<td>manual labour such as light manufacturing and other blue-collar work that does not involve heavy machinery</td>
</tr>
<tr>
<td>D</td>
<td>heavy</td>
<td>heavy manufacturing and other heavy industry</td>
</tr>
<tr>
<td>E</td>
<td>heavy</td>
<td>mining, transport, agriculture, municipalities</td>
</tr>
</tbody>
</table>

Table 3 – Completeness of reporting

<table>
<thead>
<tr>
<th>Year</th>
<th>Reported deaths</th>
<th>IBNR</th>
<th>Deaths with IBNR</th>
<th>Completeness of reporting</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>8,657</td>
<td>11</td>
<td>8,668</td>
<td>100%</td>
</tr>
<tr>
<td>2006</td>
<td>11,376</td>
<td>43</td>
<td>11,419</td>
<td>100%</td>
</tr>
<tr>
<td>2007</td>
<td>13,002</td>
<td>529</td>
<td>13,531</td>
<td>96%</td>
</tr>
<tr>
<td>2008</td>
<td>13,270</td>
<td>90</td>
<td>13,360</td>
<td>99%</td>
</tr>
<tr>
<td>2009</td>
<td>9,775</td>
<td>1,309</td>
<td>11,084</td>
<td>88%</td>
</tr>
<tr>
<td>Total</td>
<td>56,080</td>
<td>1,982</td>
<td>58,062</td>
<td>97%</td>
</tr>
</tbody>
</table>
Figure 2 shows the age-standardised mortality rates for males by salary band and industry groupings. The results show a remarkable consistency. For all industries, increasing salary is correlated with reducing mortality. Also, for all but one of the salary bands, heavier industries are associated with higher mortality.

Note also how the differentials between the various industries tend to reduce with increasing salary. This is likely indicative that at higher salaries the industry does not play an important role in the mortality. This could be due to higher salaries being more associated with office and/or managerial work that may be less exposed to risk factors particular to the industry.

Figure 3 shows the same data for females, and a very similar picture. The smaller numbers of deaths make results less than significant, especially in the highest salary bands.

From the above analysis, it is clear that salary is highly correlated with mortality, which was then investigated in more detail. Data was grouped into 20 salary bands. Figure 4 plots the age and industry-standardised mortality rate for each of these salary bands against the average salary in that band. It shows much more clearly the relationship between salary and mortality.

It shows rapidly reducing mortality as the salaries increase to R200,000 per annum; thereafter mortality reduces much more slowly. Initially, male mortality reduces more slowly than female mortality (up to R70,000 per annum), but then reduces relatively quickly.

The ratio of female to male mortality (see Figure 5) also shows an interesting relationship. At very low salaries, the ratio is quite close but rapidly reduces, eventually returning to roughly 50% at the highest salary band.

HIV prevalence in South Africa varies significantly by province, which has a corresponding impact on HIV-related mortality; between this and other factors, mortality varies significantly by province.

Figure 6 shows the clear association between province and mortality. The higher mortality in KwaZulu-Natal is most likely the result of the fact that it is the province in South Africa with the highest HIV prevalence.
the Western Cape has low prevalence. Gauteng prevalence (and mortality) is most consistent with the respective national averages.

**Modelling mortality**

Initial investigations into modelling the mortality considered the use of traditional graduation methods in order to model the mortality rates by age, sex, industry grouping and salary band.

The results from these initial graduations produced mortality rates that were satisfactory in terms of the goodness-of-fit and smoothness; however, two problems were identified:

1. When a comparison of the mortality rates between the various industry groups and salary bands was conducted, it was evident that the mortality rates for certain sub-groups (i.e., mortality rates within a single industry group and salary band) failed to capture industry and salary band mortality trends observed in other groups.

2. There was a limited exposure in certain sub-populations due to the data being subdivided by sex, industry group and salary band, and this allowed for some cases where a cross-over of mortality rates was observed (contrary to what would be expected).

The final method used to graduate the mortality of members of group schemes data was a parametric multivariate model that was fitted using age, salary band and industry as explanatory variables. While it was possible to incorporate sex as an additional explanatory variable in the model, a decision was taken to graduate the mortality rates for males and females separately due to the inherent differences in the mortality trends observed between males and females. Two sets of mortality rates were produced for ages 25 – 65. The first set was the GL05-09 Aggregate mortality rates, which provided the aggregated mortality rates by sex, and the second set was the GL05-09 rates, which provided mortality rates by industry grouping and salary band for each sex.

When considering the GL05-09 Aggregate mortality rates, as shown in Figure 7, it is interesting to note the differences between the male and female mortality rates and how the ratio decreases with age and then levels off after age 55. Furthermore, there is a hump in the mortality rates between ages 25 – 45, which could be attributed to AIDS-related deaths.
In comparing the GL05-09 Aggregate male mortality rates with South African population mortality rates (represented by the ASSA2008 mortality rates) in Figure 8, it is evident that the mortality of members of group schemes is lower than that of the general population. This is expected due to the implicit actively-at-work selection effect, which is an integral part of group schemes, and would explain the “healthy-worker effect” observed with the lower mortality rates in group scheme mortality rates. On the other hand, only a limited number of individuals within group schemes are required to go for underwriting, namely those with benefit levels in excess of the free-cover limit for the particular scheme. Consequently, when comparing the mortality rates for the members of group schemes to those of individual assured policyholders, one would expect the mortality of individual assured lives to have a lower mortality rate due to the more stringent underwriting requirements. It is therefore surprising, when considering the mortality experience of the GL05-09 aggregate male rates in Figure 8 to those of the individual assured lives population in South Africa (represented by SA85-90 Ultimate for males), to see a reversal in this relationship for ages above 60. However, this can in part be explained due to a selection effect as a result of early retirements and ill-health retirements, leaving only individuals who are healthy and want to work within the workforce. Similar results were also obtained for females.

One of the biggest advantages of using the multivariate parametric model to graduate the group scheme member mortality data is that a single graduation was carried out rather than performing individual graduations for each sub-population. In addition, the form of the model ensured that the graduated mortality rates maintained the expected relationships between different salary bands and industry groups so that there was no crossover of mortality rates as age increased. As seen in Figure 9, the Male GL05-09 Heavy Industry mortality rates reduced as salary band increased, and in Figure 10, the Male GL05-09 Salary Band 3 mortality rates reduce as industry decreases from Heavy to Mid to Light.
Taking things forward

This article provided an overview to some new research in the South African market on the mortality of insured lives of employer-based group insurance policies.

Some clear new insights emerged from this research:

• Clarification of the relationships between salary and industry, and the resultant mortality
• The differing impact of these factors by gender of the insured
• The impact of provincial differences in mortality
• Usefulness of some innovative graduation techniques to take account of the multitude of factors affecting the mortality

As a result, this research would be invaluable in developing a new pricing basis for a company doing group insurance business in South Africa. However, implementing a new pricing basis can be quite disruptive. What is technically correct and accurate on paper may return rates that are contradictory to what the market is willing to accept. For example, a new basis may result in an increase for a group that had very profitable experience. This would be very hard to explain to such a client.

A leading piece of research, such as this, could be disruptive to the market. Early adopters in the market could reap substantial benefits from implementing strategies that are able to exploit pockets of advantage.

Moreover, implementing such a new basis should be done with care and consideration. The impact on the existing portfolio of business needs to be understood. Analysis should be done, and it should be clear where the basis results in more competitive pricing as well as less competitive pricing. Such impact studies should be extended to analysing the books of business per channel and individual distributors to identify problems and advantages.

Technical accuracy needs to be blended with market forces. Only when this occurs can a group insurer fully take advantage of the results of this research.

About the Authors

Louis Rosouw is a Research and Analytics Actuary in Gen Re’s Cape Town office, supporting South Africa and the UK. Louis joined Gen Re in 2001 and has previously worked on individual pricing and product development, group pricing and reserving. He also spent two years in Gen Re’s Singapore branch as Regional Chief Actuary. Louis can be reached at Tel. +27 21 412 7712 or lruszouw@genre.com.

John-Craig Clur is a lecturer at the University of Cape Town and part of the South African Actuarial Society’s Continuous Statistical Investigations Committee. He has a master’s degree in financial mathematics and is specialising in mortality research. He has been doing contract work for the Gen Re Cape Town branch for the last three years and will be joining the Gen Re South Africa office full-time in July 2014.

Endnotes


> **Claims Focus 2013, No. 2**
Rob Frank discusses the potential benefits and legal position of using information posted by individuals on social media websites in a disability claims management setting. Ross Campbell reviews the validity of claims for whiplash injury that are common in some countries yet virtually unknown in others. Dr. Chris Ball explores the evidence for psychological disability following road traffic accidents.

> **Underwriting Focus 2013, No. 2**
Dr. Chris Ball debates the classification of psychiatric disorders against the backdrop of decreasing prevalence, and considers how the debate stirred by latest classification (DSM-5) presents a challenge to traditional mental illness models. This edition also includes a detailed review of the important revisions brought by DSM-5.

> **Risk Matters**
Adèle Groyer takes World Cancer Day as her prompt to reflect on how the insurance industry can better serve those who have been affected by a cancer diagnosis.

> **Risk Matters Oceania**
**Underwriting the Applicant with Diabetes**
Dr. John Cummins writes about the relationship between glycemic control and diabetic complications and provides guidelines on underwriting individuals who have diabetes.

**Cancer Overdiagnosis in the Pursuit of Longevity**
Dr. John Cummins examines the movement to redefine cancer in the context of research findings and asks if the insurance industry should consider altering the definitions it uses in consequence. Also, James Louw looks back at the recent challenges facing disability writers and presents the findings of some Gen Re analysis of the trends.

> **Risk Insights Index 2004 - 2013**
This index provides a listing of Risk Insights newsletter topics and articles produced during the last decade.
Gen Re, Singapore, co-hosted the Third Product Development Seminar on 22 January and Underwriting Seminar on 23 January in Jakarta, Indonesia, in collaboration with a local reinsurer, ReIndo. A total of more than 170 delegates attended. Dr. Wolfgang Droste, Chief Executive Officer, Asia Pacific, discussed “Health Insurance Experience in Asia”; Frank McInerney, General Manager, Gen Re Singapore, presented “Wellness and Insurance” and “HIV Product”; Irene Ng, Regional Chief Underwriter, Asia, presented “Cancer Development and Its Impact on CI Products” and “Cancer Development and Its Impact on Underwriting and Claims”; Petar Peric, Gen Re Australia, presented “Technologies (Underwriting Rules Engines) Under the Microscope” and “Evolving Underwriting Practices in Changing Distribution Environments”; Hazel Yong, Senior Underwriter, Gen Re Singapore, presented “Targeting the High Net Worth Market”; Silvia Zhang, Marketing Actuary, Gen Re Singapore, presented “Behind Actuarial Assumptions”; Yong Pei Nee, Underwriting Manager, Gen Re Singapore, presented “HIV Positive Individuals - Are They Insurable?”; Dr. Fajah Peshi, Regional Chief Medical Officer, Asia, presented “Understanding and Underwriting Colorectal Cancers”; Colin Bradford, Operations Consultant, Gen Re Asia, presented on “Financial Underwriting”.

Gen Re, London, hosted a meeting in conjunction with the Society of Later Life Advisers on 25 February. Jules Constantinou, Regional Manager, UK & Ireland, presented “Products for Care Funding”, Dr. Chris Ball, Consultant Medical Officer, presented “All That’s Beautiful Drifts Away INAs and Medical Underwriting” and Adele Groyer, Head of Research, presented “Statistics To Handle With Care, the Data That Feeds Into INA Pricing”.

Gen Re, Sydney, held Round Table events in Auckland on 27 February and in Sydney on 6 March. Dr. John Cummins presented “Overdiagnosis of Cancer”.

Gen Re, Madrid, hosted a Life seminar event in Lisboa on 11 March “Encontro Análise de Risco”. There were 33 delegates coming from 14 different companies. Angel Luis González and Javier Ruiz del Moral, Senior Account Executives presented “Basic Concepts of Reinsurance Life Treaties”, Gloria Palma, Underwriter Life, “Lifestyle on the assessment risk”, Ana Páez, Underwriter Life “The so big relevance of the health questionnaire” and Dr. Oñoro, CMO, “Respiratory Diseases on the Life UW process”. Cases studies were carried out by Alberto Zazo, Underwriter Life and Dr. Oñoro.
Industry Meetings

> Jules Constantinou, Regional Manager, UK & Ireland, presented "UK: Developing the Market" and Andres Webersinke, Head of Life Health Research & Development, presented "What Works Elsewhere – Germany & Singapore" at the Association of British Insurers' Social Care Summit in London on 21 January.

> Jules Constantinou, Regional Manager, UK & Ireland, presented "How Will Anyone Be Able To Pay for Their Social Care?" with Sarah Harriss, Head of Paying for Social Care, Department of Health, and the Actuarial Profession’s Highlights of the Life Convention in London on 11 March.

Mark Your Calendar

> **Gen Re, Madrid**
  *Life+P&C Spanish Market Seminar – 27 May 2014*
  *Life+P&C Spanish Market Seminar – 27 June 2014*

> **Gen Re, Sydney**
  *Rehabilitation Summit – 10 July 2014*

> **Gen Re, London**
  *Risk Matters in Ireland – 30 May 2014*
  *ReGenerate – 16 and 17 June 2014*
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