Changes in mortality of people living with HIV in South Africa and their potential implications for life assurers

By ML Strydom, D Corubolo and C Nel

ABSTRACT

This research investigates the impact of improved (and improving) mortality experience in South Africa as a result of the increased (and increasing) access to antiretroviral treatment on South African life assurers, the entry-level insurance market and the wider South African economy. The research focuses on various potential impacts on the entry-level insurance market, including new business profitability, product development and pricing, market penetration and the potential for increased savings. This research has been done with the assistance of four of the main South African life offices and also draws on the new THEMBISA AIDS model on which a working paper has been produced. The research is based on the THEMBISA model in order to investigate the potential impact of alternative mortality scenarios on typical entry-level products within the industry where the scenarios have been based on actual current and proposed antiretroviral roll-out strategies by the Department of Health. Potential improvements to profitability, premium reductions, benefit enhancements and cashback benefits are quantified using a profit test model for entry-level market products.

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1.   INTRODUCTION

1.1   Background

1.1.1   The first case of HIV in South Africa was reported in 1982, the first AIDS death in 1985 and by 1990 an estimated 74 000–120 000 South Africans were living with HIV (McNeil, 2012). The percentage of the South African population living with HIV increased from 0.8% in 1990 to 4.3% in 1994 (Similela & Venter, 2014) and to 9.3% by 2001.[1] The increase in HIV/AIDS prevalence had the resultant impact of increasing deaths due to HIV/ AIDS and, therefore, the overall number of deaths in South Africa. Figure 1 shows this increasing trend in death rate (number of deaths as a proportion of population) using data from StatsSA[2] and the Rapid Mortality Surveillance (RMS) Report (Dorrington et al., 2014).

1.1.2   The South African death rate climbed steadily from 1997 and peaked in 2006 for both sources, with over 600 000 deaths during that year.[3] The death rates from these sources are slightly different in earlier years. The main difference between the death data from StatsSA and RMS is that the latter covers only the population with ID numbers, while the former covers the whole population. The two sources show the same trend though.

1.1.3   By the end of 2005, more than five million South Africans were living with AIDS (McNeil, 2012), making South Africa the country with the greatest number of HIV infections in the world. From 2006, both StatsSA and RMS data show a decline in death rate, albeit still slightly above the levels in previous years.

1.1.4   HIV/AIDS has had a meaningful impact on the South African economy, including on consumption, investment, government expenditure and exports. Disposable
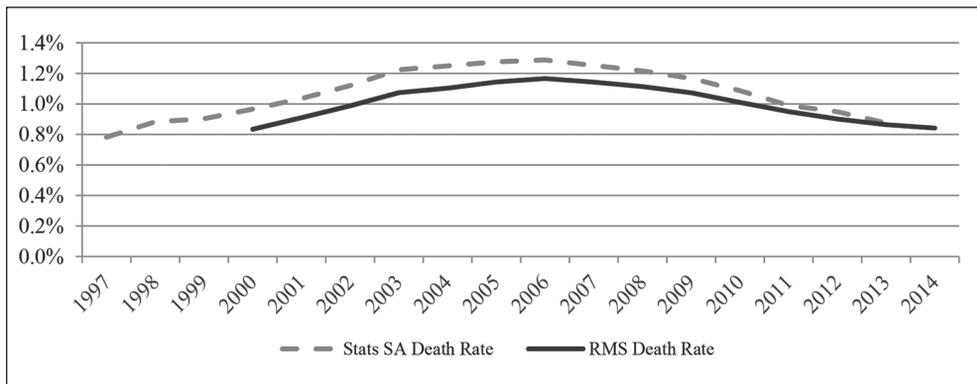

FIGURE 1. South African death rate 1997–2014

Source: StatsSA (2014);[4] Dorrington (2014)

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1   StatsSA (2009). Mid-year population estimates. 27 July 2009. www.statssa.gov.za/publications/ P0302/P03022009.pdf, accessed 18 October 2015

2   StatsSA (2009), supra; StatsSA (2014). Mortality and causes of death in South Africa, 2011: Findings from death notification. March 2014. http://beta2.statssa.gov.za/publications/P03093/P030932011. pdf, accessed 18 October 2015

3   StatsSA (2009), supra

4   StatsSA (2014), supra

income in South Africa was as much as 1.3% lower due to the AIDS impact compared to a non-AIDS environment over the period 2006 to 2011, according to the Bureau of Market Research.[5] Household savings were 0.7% lower in 2006 and 1.1% lower in 2011. The percentage of households living in poverty had increased from 40.5% in 1996 to 46.7% in 2006, and the report estimates that it would have declined if there had been no AIDS. The report estimates that by 2011 this had declined to 39.8%. The Gini coefficient also increased from 0.60 to 0.66 from 1996 to 2006, but then recovered to 0.63 by 2011.

1.1.5 The AIDS epidemic has had detrimental effect on the economy and a significant social impact in South Africa, negatively affecting households. The situation could have been even worse had it not been for the positive contribution from the South African government with its aggressive antiretroviral treatment (ART) roll-out. Mortality improvements experienced by entry-level policyholders have had significant positive financial impacts for insurers. The authors believe that continued mortality improvements present an opportunity for insurers to offer enhanced benefits to policyholders while maintaining healthy profit margins.

1.2 Problem Statement and Aim

The aim of this paper is to:
— summarise the South African government's policy on ART;
— summarise mortality improvements that have been experienced by entry-level insurers;
— present estimates of potential future mortality improvements and consequent financial impacts for entry-level new business; and
— given continued mortality improvements, explore opportunities for, and possible implications of, entry-level product enhancements that have the potential to benefit the insurance industry, policyholders and society at large.

2. ART ROLL-OUT & SOUTH AFRICAN INSURANCE INDUSTRY IMPACTS
2.1 The Role of the South African Insurance Industry

2.1.1 Prior to the year 2000, it would have been difficult for HIV-positive individuals to obtain life cover in South Africa. The only cover available to such individuals was by means of non-underwritten policies, such as funeral cover, as well as through employee benefits and group arrangements.

2.1.2 Over the 13 years from 2001 to 2014, the total premiums received by the South African life assurance industry from assistance business[6] has increased almost tenfold to R6.9 bn (FSB, 2001–2014). Adding premiums received for funeral and other entry-level life assurance business including sums assured exceeding assistance business levels from the biggest insurers in this market in South Africa (Old Mutual, Metropolitan and Sanlam), the above figure of R6.9 bn increases considerably. Our estimates, based on disclosed sales by the

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5 Demographic and Socioeconomic Indicators to measure the Impact of HIV and AIDS in South Africa, December 2012: Bureau of Market Research, University of South Africa
6 Defined by the FSB prior to 2009 as policies with sums assured of R10 000 and below, and thereafter sums assured of up to R18 000

largest players in the market, answers to our questionnaires and discussions with management teams, suggest the total amount of entry-level premiums in South Africa in 2015 was between R22 bn and R24 bn.[7] This equates to between 9.2% and 10% of the estimated total individual life insurance premiums in South Africa during the period.

      2.1.3   The increase in assistance and larger funeral sum assured business could have been driven by individuals shifting from informal burial societies to more formal insurance. The proportion of South Africans that have some form of funeral cover increased from 46% in 2004 to 73% in 2014, with the proportion receiving their funeral cover from formal sources (insurers, banks, undertakers and funeral homes), increasing from 24% to 38% over the same period (FinMark Trust, 2004–2014).

      2.1.4   We estimate that the South African life assurance industry has paid out over R50 bn[8] in death benefits over the past 15 years to the entry-level market. This is almost 17% of the total gross household savings in South Africa over the same period (SARB, 2014). As at the end of 2013, we estimate that entry-level policies in South Africa had a combined sum assured of close to R200 bn, covering an estimated 5.6 million primary and an estimated 9.5 million secondary lives.[9] By the end of 2015, the combined sum assured was likely to be over R225 bn (allowing for growth in line with premium growth). We estimate that the current sum assured in this market amounts to between 17% and 22% of the annual household income for individuals in the entry-level market (depending on whether a definition of R15 000 pm or R20 000 pm is used).[10]
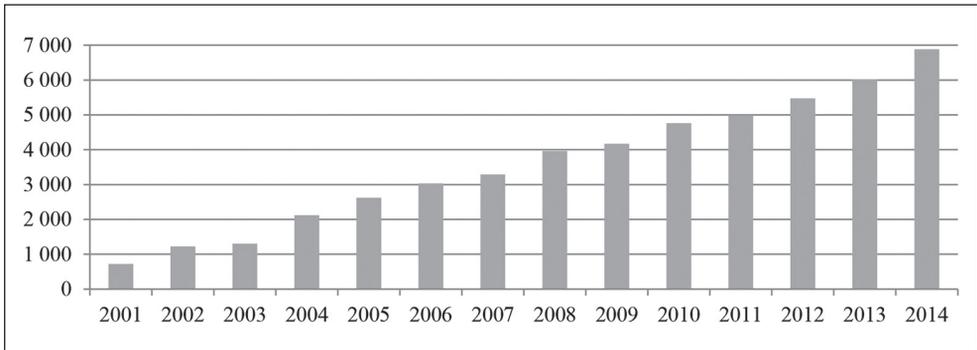

FIGURE 2. Total industry premiums for assistance business (Rm)
Source: FSB (2001–2014)

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7 Estimate based on company financial statements. Data provided by participants with pro-rata adjustment after referencing assistance business figures from FSB annual reports 2001–2014

8 Ibid.

9 Ibid.

10 Ibid; StatsSA (2012). Census 2011: Statistical Release (Revised) P0301.4. www.statssa.gov.za/publications/P03014/P030142011.pdf, accessed 30 November 2016; StatsSA (2014), supra

2.2   ART in South Africa—Development of Government Policy

2.2.1   During the early part of the development of the AIDS epidemic in South Africa, there was a much greater focus on prevention rather than treatment by government. The focus on 'provision of condoms and a "safe-sex" education strategy' during the 1980s and 1990s, as well as the controversies surrounding the Sarafina II play and the Virodene scandal, hampered treatment efforts (Similela & Venter, 2014). There were delays in the roll-out of ART, with government opting for a phased piloting approach. A statement was released by Cabinet in April 2002 where it "reiterated government's commitment to the HIV & AIDS and STI Strategic Plan for South Africa, 2000–2005" and affirmed that "government's starting point is based on the premise that HIV causes AIDS" (Similela & Venter, 2014). This ushered in a change in ART strategy in South Africa with the first step being a Joint Health and Treasury Task Team to "propose options for expanding the HIV treatment response beyond Prevention of Mother to Child Transmission (PMTCT) and post-exposure prophylaxis".

2.2.2   After receiving the report of the Joint Task Team in August 2003, "in November 2003 the Operational Plan for Comprehensive HIV and AIDS Care, Management and Treatment for South Africa was presented to and approved by Cabinet", following which ART was introduced at several service points across the country on 1 April 2004 (Similela & Venter, 2014).

2.2.3   Figure 3 shows the substantial increase in the number of patients receiving ART in South Africa from less than 50 000 in 2004 to almost 1.8 million in 2011, almost 2.5 million in 2013 (Bekker et al., 2014) and 3.1 million in 2014.[11] "A decision was made to increase the initiation threshold to 350 cells/μl for all adults, as well as to expand access thresholds for children" (Similela & Venter, 2014: 251).   "By mid-2013, 6.4 million people
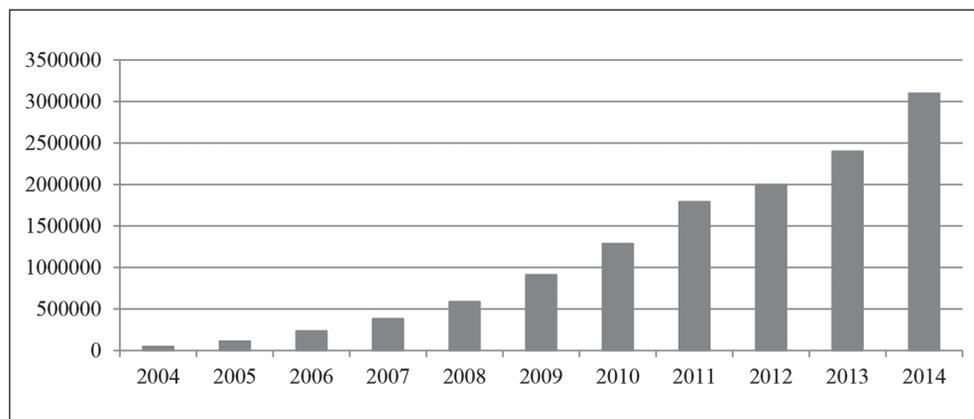

FIGURE 3. Number of patients receiving ART in South Africa
Source: Johnson (2012); Bekker et al. (2014); *Mail and Guardian* (2015)[12]

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11 HIV-infected South Africans on ARVs could double. *Mail and Guardian*, 30 September 2015
12 Ibid.

were estimated to be living with HIV in South Africa, with an estimated 2.3 million on ART, and expanded access to 'third-line' drugs for patients experiencing resistance" (Similela & Venter, 2014: 261). During his 2014/2015 health budget vote speech, the Minister of Health announced that from January 2015, HIV-positive patients would be eligible for ART once their CD4 count fell below 500 cells/μl compared with the previous level of 350 cells/μl (Motsoaledi, 2014).

2.3 Mortality Trend since 2005

2.3.1 Life expectancy at birth showed a sharp decline from 1994 to 2006 as a result of the AIDS epidemic. Total population life expectancy had fallen to 54 years by 2003 (from 62 years in 1994) and remained there until 2005.[13] Since then, life expectancy at birth has improved meaningfully with the help of the aggressive roll-out of ART. According to ASSA2008, which was published in 2011, life expectancy would have improved to 58 years by 2014. However, using more up-to-date data from the RMS report of 2014 (Dorrington et al., 2014), the increase is even more pronounced with total population life expectancy in 2014 estimated at 62.9 years.

2.3.2 While advances in medical technology and greater access to medical facilities in general would have contributed to this improvement, we believe that accelerated ART roll-out is a significant driver. The indications are that life expectancy has improved even further since 2014, especially in the light of the Department of Health's (DoH) change in CD4 count threshold in 2011 to 350 cells/μl, and could increase even further following the change in the CD4 count threshold to 500 cells/μl (effective January 2015). Emerging threats to these mortality improvements include increasing drug resistance, rising frequencies of drug stock-outs and patients not adhering to prescribed treatment programmes.
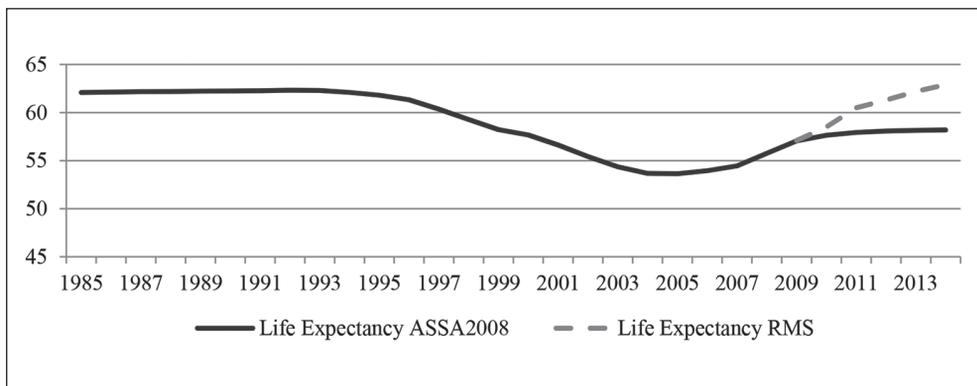

FIGURE 4. South Africa total life expectancy (years)
Source: ASSA AIDS and Demographic Model;[14] Dorrington (2014)

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13 Actuarial Society of South Africa (ASSA) (unpublished). ASSA AIDS and Demographic Model. http://aids.actuarialsociety.org.za/ASSA2008-Model-3480.htm, accessed 18 October 2015
14 ASSA (unpublished). ASSA AIDS and Demographic Model, supra

2.4   Impact on Life Assurers and Their Policyholders

2.4.1   During most of the 2000-to-2015 period, the South African life assurance industry experienced a period of strong mortality profits manifesting in higher international financial reporting standards (IFRS) earnings and positive embedded value (EV) experience variances. Much of this experience, especially in the earlier years, was as a result of improved life expectancy in the middle-income and affluent markets, which is consistent with the experience in much of the developed world. However, during the latter part of the period, the entry-level market also contributed to this trend due to increases in life expectancy.

2.4.2   Using publicly available information, we considered the impact of mortality (and in some cases morbidity) experience on the embedded values of the five main companies in the South African insurance industry. We illustrate in Table 1 that the sum of experience variances plus basis changes as a percentage of starting embedded value averaged between 0.7% and 2.6% over the period from 2010 to 2015.

2.4.3   When we consider the publicly available information that focuses more directly on the entry-level market, a similar trend emerges with mortality experience variances plus mortality basis changes as a percentage of starting embedded value of between 1% and 3% from 2010 to 2015.

TABLE 1. Mortality* experience variance and basis change as a percentage of starting embedded value

	2010	2011	2012	2013	2014	2015
Company 1	1.4%	1.1%	3.0%	1.3%	4.4%	1.4%
Company 2	1.2%	1.4%	1.8%	3.3%	2.3%	3.4%
Company 3	1.1%	1.8%	1.2%	3.2%	2.0%	1.4%
Company 4	−0.6%	−0.2%	2.0%	0.8%	0.7%	0.4%
Company 5	0.5%	0.3%	5.0%	0.1%	0.6%	0.4%
Average	0.7%	0.9%	2.6%	1.7%	2.0%	1.4%

*In some cases, this includes morbidity as well
Source: Company financial statements—Clientele Life (2010–2015); Liberty Life (2011–2016); Metropolitan Life/MMI (2011–2015); Old Mutual (2011–2016); Sanlam (2011–2016)

2.4.4   Questionnaires completed by the major life offices confirmed that positive mortality experience variances have been achieved in the entry-level market over recent years. Although much of the mortality profits were earned in the middle-income and affluent market, there has also been a strong trend in the entry-level market. Most of the companies surveyed confirmed an improving trend since 2006, which has tapered off in recent years, largely due to a weakening of mortality basis. Although this corresponds to the period of accelerated ART roll-out, companies have not seen any evidence of causality. Other factors, in addition to ART, may have also contributed to the improvement.

2.4.5   The improved mortality experience for South African insurers over recent years has allowed these companies to pass benefits to policyholders. All the companies

surveyed have, to some extent, allowed for improved mortality experience in their reserving basis, but none of them have taken account of any future improvements due to the accelerated roll-out of ART in reserving for entry-level products (the exception being annuity business). All companies conduct mortality experience investigations annually for their entry-level businesses. None of the companies allow for expected future mortality improvements in pricing for life assurance in the entry-level market although regular cover reviews are typically undertaken (often every five years).

2.4.6   A notable element in the feedback provided is that persistency (or lapse) experience is usually a more important factor than mortality in determining the profit margin of the in-force book. Hence lower new business premium rates that lead to churning of the existing book will result in lower margins despite an improving mortality environment. The sensitivity and impact of this is assessed in our modelling in Section 4.

2.4.7   There was a mixed response from companies regarding the method used for dealing with improved mortality experience; some companies indicating that it would likely all be passed to policyholders, while others favoured profit enhancements for shareholders.

2.5   ART Roll-out Considerations

2.5.1   Over the past decade, there have been a number of developments relating to ART; these include types of drugs offered, cost of treatment, budgets and patient attitudes. From 2004 to 2010, ART drugs such as stavudine (d4T), azidothymidine (AZT), lamivudine (3TC), efavirenz (EFV) or nevirapine (NVP) were used by the DoH in South Africa for the treatment of HIV-positive patients.[15] From 2010 to 2013, tenofovir (TDF) was also introduced. A big change occurred in 2013 when a fixed-dose combination (FDC) of TDF/emtricitabine (FTC)/EFV was introduced in all newly-initiated patients. This development was significant from an adherence, efficacy and cost point of view.

2.5.2   According to an advice document (Davies, 2013), there are numerous advantages to FDC, including the simplification of regimen and stock management, improved adherence levels (Sax et al., 2012; Stone et al., 2001; Chesney, 2000), and the proven efficacy of TDF/FTC/EVF-based triple ART in randomised controlled trials (Pozniak et al., 2006; Gallant et al., 2006; 2004). The South African government negotiated a reduced cost of R89–37 per patient per month for the FDC treatment (Motsoaledi, 2012) in 2012, which represents a significant cost saving compared with the old, single-drug tender.

2.5.3   Unfortunately, the cost savings negotiated in 2012 have been eroded over subsequent years due to the depreciation of the rand. The latest tender has pushed the cost of first-line treatment to R111–93[16] per month, which is still well below the 2010 tender. Table 2 highlights the average first line cost of therapy per adult patient per year for the 2008, 2010 and 2012 tenders, with specific focus on the drug cost element.

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15 Clinical Guidelines for the Management of HIV & AIDS in Adults and Adolescents, 2004–2010: National Department of Health. http://aidsinfo.nih.gov/guidelines/html/1/adult-and-adolescent-arv-guidelines/0/, accessed 18 October 2015

16 Weak rand means South Africa pays more for ARVs in latest tender. NSP Review, June 2015

2.5.4   In addition to the reducing cost of ART (especially drug cost), the South African government has increased related spending and is committed to further increasing amounts allocated for ART in future. Figure 5 considers the actual national and provincial HIV/AIDS spend from 2006/2007 to 2012/2013 and the budgeted amounts until 2016/2017.

2.5.5   Over the period from 2006/2007 to 2015/2016, the HIV/AIDS budget increased almost eightfold from R2 bn to R15.5 bn. This is budgeted to increase to over R22 bn over the next four years at an average growth rate of 12.9%, well above inflation.

2.5.6   The ART drug cost reductions (delivered and potential), combined with budget increases, should allow the DoH to continue to increase its ART roll-out even further over coming years, which is likely to have a further positive impact on mortality and life expectancy in South Africa.

TABLE 2. Average cost of first-line therapy per patient year (2011 ZAR)

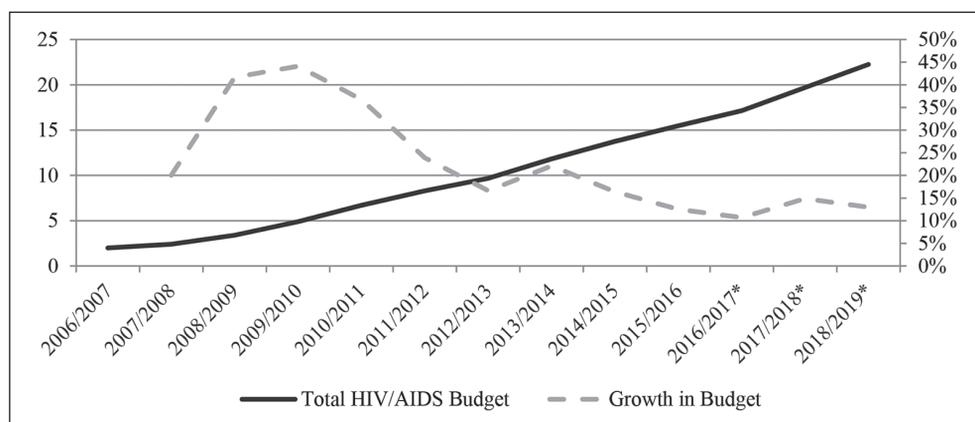| Item	Cost	% of total cost	% change to last tender
2008 tender (including Oral Solid Dose from August 2009)			
Average first-line cost	R5 617		
— of which drug cost	R2 530	58%	
2010 tender			
Average first-line cost	R5 303		−6%
— of which drug cost	R2 216	51%	−12%
2012 tender			
Average first-line cost	R4 334		−18%
— of which drug cost	R956	22%	−57%

Source: Meyer-Rath,(2014)

FIGURE 5. South Africa HIV/AIDS budget (Rbn)
*Budgeted numbers vs. actual
Source: National Treasury (2014); Ndlovu, Guthrie & Mbatha, K (2012)

2.6   The Potential for ART Roll-Out to become More Aggressive

2.6.1   Following the introduction of ART provision in earnest in 2004, the number of patients receiving ART has increased significantly. An important shift in provision occurred in 2011, when the decision was made to change the eligibility criteria for the receipt of treatment from a CD4 count of 200 cells/μl to 350 cells/μl for all adults, as well as to expand access. In the National Strategic Plan (NSP) on HIV, STIs and TB 2012–2016, a number of strategic objectives were highlighted, which included addressing social and structural drivers of HIV and TB prevention, care and impact, preventing new HIV, STI and TB infections, and sustaining health and wellness" (DOH, 2011). These objectives have the potential of further reducing death rates due to HIV/AIDS and increasing life expectancy within South Africa. Issues addressed include increased roll-out of HIV testing and TB screening, a reduction of mother-to-child HIV transmission to 2% at six weeks and 5% at 18 months by 2016, a provision of universal access to HIV and TB screening, diagnosis, care and treatment, and ensuring that people living with HIV, STIs and TB remain within the healthcare system. We believe that even if only half of these strategies are successfully implemented, the potential is great for further mortality reduction and increased life expectancy.

2.6.2   The DoH's track record in delivering on its targets is very good, especially if we consider the targets set out in the NSP for 2007–2011 (DoH, 2007). One of the key targets in the NSP was to achieve new ART enrolment numbers equal to 80% of the number of newly-eligible individuals in each year, by 2011. The number of adults starting ART in 2010/2011 was well in excess of the 80% target (Johnson, 2012). In fact, the ratio of the number of adults actually starting ART relative to those eligible to start over the period from mid-2010 to mid-2011 was more than 1.5 times (as the backlog was reduced).

2.6.3   An additional development that supports our view that further mortality reduction and increased life expectancy is likely in South Africa is the decision by the DoH to increase the eligibility criteria for the receipt of treatment even further from a CD4 count of 350 cells/μl to 500 cells/μl for all adults (Motsoaledi, 2014).

2.7   The Insurability of HIV in South Africa

2.7.1   There was some initial resistance from South African insurers to providing cover to HIV-positive individuals in the retail insurance market. Insurers offered limited cover through funeral products and reduced their risk of anti-selection by offering higher levels of cover through employee benefit and group schemes. Since April 2007, life offices in South Africa no longer apply HIV/AIDS exclusions to life and disability policies following a best practice recommendation by the Life Offices Association[17] to its member offices to waive existing HIV/AIDS exclusions for all lump-sum death and disability benefit claims submitted from 1 April 2007. Exclusions can, however, apply in instances of material non-disclosure.[18] Metropolitan Life began offering cover to HIV-positive individuals in 1996 (Metropolitan Life, 2009), and smaller South African insurance companies like Altrisk and

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17 The LOA is now known as ASISA, the Association for Savings & Investment South Africa
18 Life insurers to waive existing HIV/AIDS exclusions. *FA News*, March 2007

AllLife offered risk cover to HIV-positive individuals from 1999, but it was only recently that larger companies such as Liberty, Sanlam and Old Mutual started offering less restrictive and more affordable cover to these lives. Sanlam was the first major local life insurer to offer standard life cover not requiring proof of ongoing adherence to treatment by people living with HIV[19] in August 2013, followed by Liberty and Old Mutual in the same year. Cover was extended to include severe illness and disability.

2.7.2   In their presentation to the International Congress of Actuaries in 2014, Sarkin et al. (2014) explored the "Insurability and Survival of Lives Living with HIV and Other Chronic Diseases". The authors compare the survival and mortality experience of subgroups of HIV-infected lives and lives with other chronic conditions requiring lifelong treatment (e.g. Type 2 Diabetes) to the mortality experience of a control group. The authors derived relative risk estimates for HIV subgroups that were stratified by current CD4 count, current viral load, baseline CD4 and duration since ART initiation. Relative risk was lowest for patients with current CD4 counts ≥ 200 cells/μl and current viral loads ≤ 400 copies/ml (best subgroup) and highest for those with current CD4 counts <200 cells/μl and current viral loads >400 copies/ml (worst subgroup).

2.7.3   The relative risk of the worst subgroup exceeded the extra mortality threshold commonly used by underwriters when rating sub-standard lives (five times standard rates) regardless of the baseline CD4 count and time since ART initiation. The relative risk of the best subgroup remained well below the threshold, reducing with increasing time since ART initiation and levelling off after three to four years since ART initiation.

2.7.4   We believe that the research of Sarkin et al. (2014) provides support for insurance product changes and that there is room to provide standard (albeit loaded) policies to HIV-positive individuals. This research supports our view that there is room for post-sale underwriting in the entry-level insurance market, namely by enhancing benefits for policyholders that exhibit better mortality experience than had originally been allowed for in premium rates. In this way the benefits of potential improvements in mortality and life expectancy can be shared between insurers and policyholders.

3.   RESEARCH METHODOLOGY AND MODELLING
3.1   Modelling Alternative Mortality Scenarios

3.1.1   In a recent working paper, Johnson (2014) introduced the "THEMBISA integrated demographic and epidemiological model of the South African HIV/AIDS epidemic". The paper provides a useful summary of the two most widely used AIDS models in South Africa, namely the Spectrum/EPP model[20] and the ASSA2008 model.[21]

3.1.2   The Spectrum/EPP model is used in producing UNAIDS estimates of the global distribution of HIV. A shortcoming of the model is that it separates the modelling of

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19 Better life cover for those with HIV. *Personal Finance*, December 2013
20 Stover, J, McKinnon, R & Winfrey, B (unpublished). Spectrum/EPP model. www.unaids.org/en/dataanalysis/datatools/spectrumepp2013/ accessed 18 October 2015.
21 ASSA (unpublished). ASSA AIDS and Demographic Model, supra

HIV incidence and the demographic impact, thus limiting the ability to calibrate the model using age-specific data. The model is also limited in terms of evaluating the impact of HIV prevention strategies and make long-term projections.

3.1.3 The ASSA2008 model integrates the demographic and epidemiological impacts. However, several problems have emerged with this model in recent years. One problem is the assumption that ART initiation can occur only at the time of the first AIDS-defining illness which is inconsistent with guidelines recommending ART initiation at earlier stages of the disease for disease management and as a prevention strategy (World Health Organization, 2013). The model also does not make allowance for a number of new prevention strategies, and there is some concern that the model assumptions regarding sexual behaviour may be unrealistic. The model further assumes mother-to-child transmission only from those mothers who are HIV positive in early pregnancy. However, there is substantial transmission risk if the mother acquires HIV in late pregnancy or while breastfeeding. Lastly, the model is now out of date as it is based on data up to 2008 only. Given these limitations, the AIDS Committee of the Actuarial Society of South Africa (ASSA) has issued a cautionary note regarding the model.[22]

3.1.4 The limitations of the above models are addressed by the THEMBISA model (Johnson, 2014). This model integrates four different models: the STI-HIV Interaction model, UCT Paediatric HIV model, NSP ART Need model and the ASSA model. The objective of Johnson's working paper is "to provide a comprehensive description of the THEMBISA model assumptions and to present the basic model results up to 2012".

3.1.5 Preliminary estimates from the THEMBISA model point towards a more marked reduction in AIDS deaths since 2005 than suggested by either the ASSA2008 or the Spectrum/EPP South Africa models, with which a comparison was drawn in the working paper. Figure 6 highlights that by 2011, the annual death estimate from the THEMBISA model is the lowest of the three models and that this trend continues in 2012.

3.1.6 It is emphasised that the mortality estimates from THEMBISA presented below are preliminary. Sources of uncertainty regarding these estimates include non-AIDS mortality being out of date (as they haven't been updated to reflect the data from the most recent census) and an assumption of a six-month delay to ART initiation.

3.1.7 In our research, we have used the THEMBISA model to generate alternative mortality assumptions, based on different ART roll-out scenarios. We have generated three scenarios, namely a baseline scenario, a CD4<500 scenario based on a more aggressive roll-out of ART, and a conservative scenario:

— The baseline scenario is based on government policy until January 2015, which provided ART to all adults who have a CD4 count of 350 cells/μl.

— The CD4<500 scenario allows for the roll-out to be expanded to include all adults with CD4 count of 500 cells/μl, which the government introduced from January 2015.

— The conservative scenario is our estimate of the current basis being used by the South African life insurance industry for pricing and reserving. The main differences between this and the baseline scenario are:

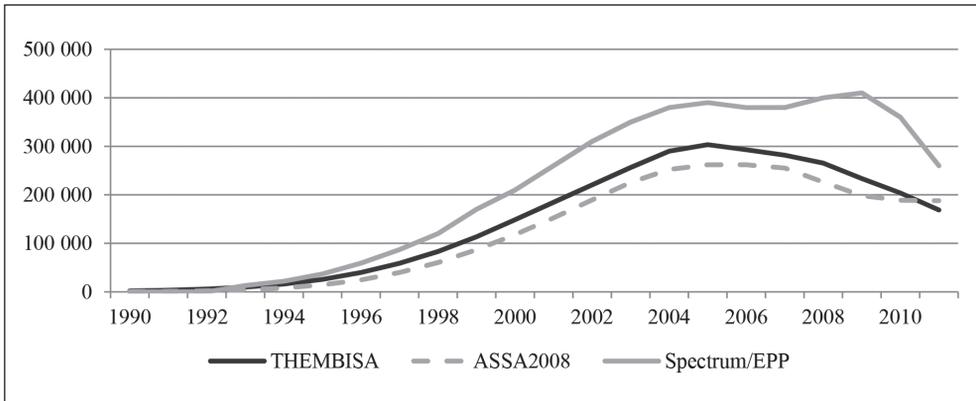22 ASSA media release, 9 March 2011. Expansion of ARV programme in SA slows AIDS mortality rate

FIGURE 6. Model estimates of annual AIDS deaths
Source: ASSA AIDS and Demographic Model;[23] Johnson (2014);
Stover, McKinnon & Winfrey, (unpublished)[24]

— a more conservative estimate of the future delay between diagnosis and ART initiation (12 months instead of 6 months, for individuals who have CD4 <200 at diagnosis);
— higher mortality at longer ART durations (doubling the default HIV-related mortality assumptions for adults who have been on ART for more than four years); and
— no allowance for mortality improvements after December 2013 to be consistent with the approach followed by life offices when reserving and pricing for non-annuity products.

3.1.8   We have tested the conservative scenario with the life offices that participated in our research and received mixed responses, with some companies considering it to be 'ball-park', some considering the rates higher than their assumptions at certain ages and others lower. On balance, based on the feedback that we received, we consider these rates to be an appropriate starting point for our analysis.

3.1.9   In Figure 7, we have compared the combined life expectancy (males and females) that we have derived from the different mortality scenarios that we use in our modelling. Note that in the case of the conservative scenario, we have not allowed for any mortality improvements after 2013 to be consistent with the approach that most South African life offices use in pricing and reserving for entry-level policies (excluding annuities).

3.1.10   Although the conservative, baseline and CD4 <500 cells/μl scenarios start off with lower life expectancies than the ASSA2008 model in 2005, a cross-over occurs in 2011 and from there on, the gap in life expectancy between these models consistently increases. For example, by 2023, the baseline scenario predicts an increase in life expectancy to 64.4 years compared with 58.9 years under ASSA2008 and 59.6 years under our conservative

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23 ASSA (unpublished). ASSA AIDS and Demographic Model, supra
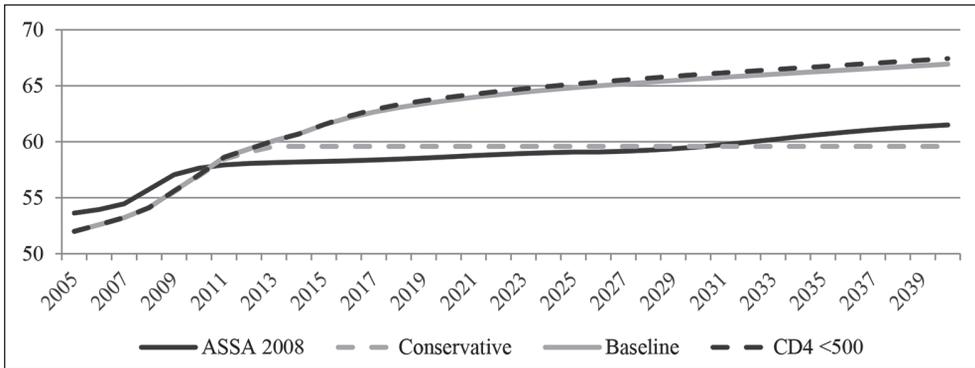24 Stover, J, McKinnon, R & Winfrey, B (unpublished). Spectrum/EPP model, supra

FIGURE 7. South African combined life expectancy
Source: ASSA AIDS and Demographic Model[25]

scenario. By 2033, the baseline scenario predicts an increase in life expectancy to 66.0 years, with the more aggressive CD4<500 scenario predicting a life expectancy of 66.4 years. The difference between the baseline and the CD4<500 scenario is fairly small and driven more by the reduced infectiousness of the population under the CD4<500 scenario than lower mortality experienced by HIV-positive individuals. In our opinion, the recent change in the CD4 count eligibility threshold further increases the conservatism in our analysis.

3.2 Modelling of Funeral Business

In order to test the impact of the alternative mortality scenarios discussed in the previous section, a cashflow projection model was developed using Prophet software. While the model does not try to replicate the entire South African entry-level market due to limited information available to the authors, it does aim to create a model portfolio that can provide an indication of how alternative mortality scenarios could impact various metrics relevant to a tranche of new funeral business sold, including: the present value of new business premiums (PVNBP), the value of new business (VNB) and new business margins (VNB/PVNBP). Appendix A summarises the model assumptions used. Furthermore, the alternative mortality scenarios were applied to a variety of entry-level product designs, including products with cashback benefits, funeral products with surrender values, products with premium waivers and products with premium holidays. We have investigated the relationship between mortality and persistency experience.

3.3 Questionnaire to Life Offices

3.3.1   In order to test a number of the modelling assumptions and to inform our discussions in Section 5 relating to the opportunities and implication for entry-level insurance products of improved mortality experience, we utilised feedback from a detailed question-naire to four of the main life offices that operate in the entry-level market.

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25 ASSA (unpublished). ASSA AIDS and Demographic Model, supra

3.3.2 The questionnaire focused on eight main themes that may be impacted by changes in mortality experience:

— Theme 1: Defining the scope and market segment for which data and information will be provided;
— Theme 2: Trends observed relating to the demand for products;
— Theme 3: Impact on product development and pricing;
— Theme 4: Impact on market penetration and sales for risk products;
— Theme 5: Impact on potential for increased savings and investments;
— Theme 6: Ability of current systems and processes to deal with different product sets;
— Theme 7: Impact on external perception of life offices due to potential mortality improvements; and
— Theme 8: Successes in providing increased coverage and enhanced benefits.

4. MODEL RESULTS AND ANALYSIS
4.1 Introduction

4.1.1 As mentioned previously, it was not possible for the researchers to create a portfolio of entry-level policies that could approach anything like a model office for the South African industry given the limited information available.

4.1.2 We have instead attempted to generate a portfolio of new business policies with what we believe are similar characteristics to the majority of business currently sold by insurers in the entry-level funeral market. In particular, our portfolio was selected to have:

— an age, gender and dependants' profile that we believe is similar to that of new business currently being sold in the South African entry-level funeral market;
— an average sum assured, which is assumed to be similar to funeral business currently being sold in the market;
— premium rates which are similar to actual premium rates for new business in the market;
— mortality assumptions, in our conservative scenario, which appear reasonably consistent with assumptions currently used for pricing in the market, and importantly, do not allow for future mortality improvements; and
— other assumptions, including lapses, expenses, commission, etc. that are in line with assumptions currently used in the market.

4.1.3 The average risk profile (age, gender, number of dependants), average premiums and sums assured, and lapse and expense assumptions have been derived with some limited input from life offices (see Appendix A).

4.1.4 A new business model was constructed from answers to our questionnaires, discussions with companies, publicly available information and our own assumptions. The model has been used to consider the impact of alternative mortality scenarios on different aspects of new business, including PVNBP, VNB and with specific focus on new business margins.

4.2   Impact of Alternative Mortality Scenarios on New Business Portfolio

4.2.1   A typical entry-level funeral new business portfolio was created based on the assumptions highlighted in Appendix A, which generated new business results that are broadly in line with what has been observed in published results over recent years. In particular, the model portfolio under our conservative mortality scenario produces a new business margin of 8%, which is broadly in line with what Old Mutual Mass Foundation, Sanlam Entry-Level and Metropolitan Retail have published over recent years (see Figure 8). The margins for these companies may also include a savings element, which reduces the overall level compared to a risk-only margin.

4.2.2   The new business model was used to assess the impact of more aggressive mortality scenarios on new business margin, premium levels and sum assured levels. We have also tested the outcomes under different lapse scenarios, including 50% higher lapses, 20% higher lapses, 20% lower lapses and 50% lower lapses at all durations. We outline the results below.

4.2.3   Table 3 highlights that under the current lapse scenario and our conservative mortality scenario (i.e. based on current insurer practice of not anticipating future mortality improvements), the model portfolio of new business generates a new business margin of 7.9%. The table also shows the sensitivity of new business margin to lapse assumptions with margin rapidly declining to 3.7% when lapses are assumed to be 20% higher at all durations and turning negative if lapses are assumed to be 50% higher.

TABLE 3. New business margins under different mortality and lapse scenarios

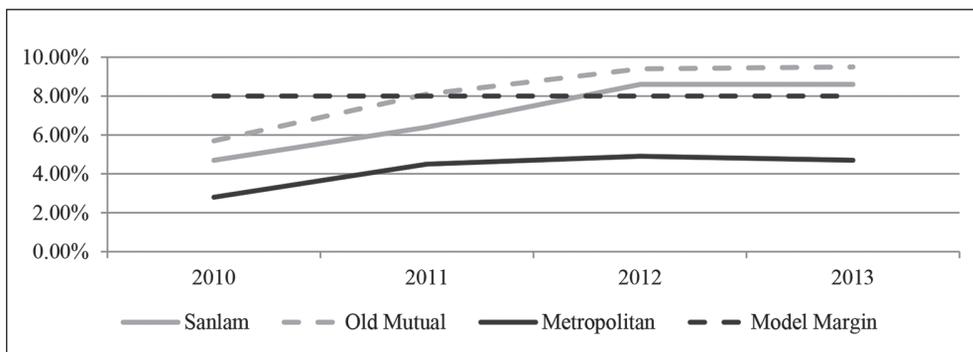|	Conservative	Baseline	CD4 500 AIDS
Lapses 50% lower	14.8%	20.4%	20.6%
Lapses 20% lower	11.3%	16.4%	16.6%
Current lapses	7.9%	12.7%	12.9%
Lapses 20% higher	3.7%	8.2%	8.4%
Lapses 50% higher	–4.2%	–0.1%	0.1%

FIGURE 8. Recent new business margins compared to authors' model

Source: Metropolitan Life/MMI, Old Mutual, and Sanlam company financial statements (2010–2013)

4.2.4   The more aggressive mortality scenarios that we model have a very positive impact on the new business margins. Assuming no change in lapses, the model suggests a 4.8% margin increase (i.e. 61% increase) to 12.7% under the baseline mortality scenario. Under the CD4<500 scenario, the new business margin increases to 12.9% (i.e. 63% increase). These increases can be contextualised by considering Figure 8 above, which shows that the largest annual change in new business margin for any insurer was only 2.2% (or 34% increase)—this was for Sanlam between 2011 and 2012. Even with 20% higher lapses our baseline and CD4<500 scenarios still generate healthy new business margins (4% and 6% above the conservative scenario). It is noteworthy that, because of the importance of lapses in the earlier years, there isn't a meaningful difference between the baseline and the CD4<500 scenario and as a result we exclude it from further discussion.

4.2.5   We recognise that it is unlikely that mortality improvements would simply be passed to shareholders as is implied by our analysis above. We have therefore also considered implications for an improved mortality scenario for premiums and sums assured.

4.2.6   The modelling indicates that, assuming no change in lapses, the average premium on the model portfolio could be lowered by 11% whilst maintaining new business margins under the baseline mortality scenario. Even if lapses were 20% higher at all durations, a slightly lower office premium (1% lower) would be required to maintain new business margin under the baseline scenario. If lapses were to decline, the premium reductions would be even more meaningful than 11%.

4.2.7   A similar analysis was performed on the sum assured that could be offered to policyholders under different mortality and lapse assumptions.

4.2.8   The modelling indicates that, assuming no change in lapses, the average sum assured on the model portfolio could be increased by 29% whilst maintaining new business margins under the baseline mortality scenario. Even if lapses were 20% higher at all durations, a 2% higher sum assured could be offered that would maintain new business margin under the baseline scenario. If lapses were to decline, the sum assured increases would be even higher.

TABLE 4. Office premiums and sums assured (as a % of the current) under different mortality and lapse scenarios—new business margin fixed at 8%

	Premiums		Sum assured	
	Conservative	Baseline	Conservative	Baseline
Lapses 50% higher	136%	123%	40%	50%
Lapses 20% higher	111%	99%	80%	102%
Current lapses	100%	89%	100%	129%
Lapses 20% lower	93%	82%	116%	149%
Lapses 50% lower	86%	76%	130%	167%

4.2.9   In addition to sharing better mortality experience with policyholders through lower premiums and higher sums assured, we have also investigated other potential

benefit enhancements. These are cashback benefits, surrender values, premium waivers, and premium holidays.

4.3 Impact of Alternative Mortality Scenarios on Different Product Designs

4.3.1 To test the impact of more aggressive mortality and lapse scenarios on policies with the abovementioned alternative benefit enhancements, we modified our funeral product to incorporate each of the enhancements independently and such that the new business margin remains unchanged at 8% under the conservative scenario:

— cashback benefit of six months' premium every five years, requiring an increase in the average office premium of 10% from R2 160 p.a. to R2 376 p.a.;
— surrender value benefit of 14% of premiums paid to surrender date, resulting in the average office premium increasing by 10% from R2 160 p.a. to R2 376 p.a.;
— premiums waived after age 60, provided the policy has been in force for at least five years, resulting in the average office premium increasing by 8% from R2 160 p.a. to R2 333 p.a.; and
— premium holidays available, resulting in no change to the average office premium as the default design already allows for a premium holiday of 10% of total premiums.

4.3.2 We then tested the enhanced benefits under different mortality and lapse assumptions to measure the extent to which benefits could be enhanced even further (while keeping premiums and new business margins unchanged). For the premium waiver benefit the benefit remains unchanged, and we instead measured the impact to the office premium (in order to keep the new business margin unchanged).

TABLE 5. Impact of different mortality and lapse scenarios on example new business products—new business margin fixed at 8%

	Cashback (no. of premiums)		Surrender value (% of premiums to date)		Premium waiver (% of current premium)		Holiday (% of premiums)	
	Conserv-ative	Baseline	Conserv-ative	Baseline	Conserv-ative	Baseline	Conserv-ative	Baseline
Current lapses	6	13	14%	30%	108%	96%	10%	20%
Lapses −20%	11	17	29%	45%	101%	90%	16%	26%
Lapses −50%	16	21	40%	56%	97%	85%	23%	32%

4.3.3 The modelling shows that, assuming no changes in lapses, under our baseline mortality scenario a cashback of 13 months' premiums could be offered compared with the six months' worth of premiums under the conservative scenario.

4.3.4 If lapses were to reduce in years 1 to 4 (which is possible if policyholders had the expectation of a cashback benefit), our modelling shows that an even higher multiple of monthly premiums could be offered as a cashback. A 20% reduction in year-1-to-4 lapses

could increase the multiple of monthly premium to 17, while it could increase to 21 monthly premiums if lapses were to decline by 50%.

4.3.5   The modelling shows that, assuming no changes in year-1-to-4 lapses under our baseline mortality scenario, surrender values of 30% of premiums paid to date could be offered compared with the 14% of premiums under the conservative scenario.

4.3.6   If lapses were to reduce similarly in years 1 to 4 (which is again possible if policyholders had the expectation of a surrender value), our modelling shows that an even higher proportion of premiums could be offered. A 20% reduction in year-1-to-4 lapses could increase the surrender value percentage to 45% under the baseline mortality scenario, while it could increase to 56% of premiums received to date if lapses were to decline by 50%.

4.3.7   Offering a waiver of premium benefit without any change to mortality or lapse assumptions would require an 8% increase in office premium compared to a policy without such a benefit. Under the baseline mortality scenario, the benefit could be offered at a 4% lower premium compared with a policy without such a benefit, without impacting new business margin. If we allow for reduced lapses, the required premium is even lower and varies between a 10% and 15% reduction, depending on the extent of the lapse reduction and the mortality scenario used.

4.3.8   The conservative scenario allows for 10% of premiums to be missed without policies lapsing. Under our baseline mortality scenario, this increases to 20%, which amounts to 2.4 months' premiums if all policyholders skip premiums or four months if 60% of policyholders skip premiums. It could allow the criterion for lapsing a policy to be changed to reflect five missed premiums compared to the typical current definition of two missed premiums. This should have a positive impact on lapse rates.

5.   OPPORTUNITIES AND IMPLICATIONS FOR ENTRY LEVEL PRODUCTS
5.1   Potential for New and Enhanced Products

It is our view that there is great potential for development in entry-level products in the light of improved and improving AIDS mortality experience. Currently, the entry-level market is dominated by funeral products, which are not underwritten, offer limited sums assured, have no surrender values and suffer from high lapse rates.

5.1.1   UNDERWRITING

5.1.1.1   It is the general view from insurers that operate in the entry-level market that policyholders prefer not to be underwritten when they purchase policies. Although some policies may require a limited number of questions to be answered, detailed questionnaires, medical declarations and blood tests are rare in the funeral market.[26]

5.1.1.2   We believe that a continuing AIDS mortality improvement in the entry-level market could offer life offices an increased opportunity for post-sale underwriting by offering enhanced benefits to policyholders that exhibit better mortality experience than had been allowed for in premium rates. The mechanism for such underwriting could be to:

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26 Lower premiums on underwritten policies. *Personal Finance*, April 2013

— pay cashback benefits to policyholders that survive and don't lapse;
— offer surrender values on funeral policies for policyholders that survive and don't lapse for a given period (say five years);
— include a premium waiver benefit from retirement age (benefiting policyholders that survive to this age); or
— allow for longer premium holidays or enhance benefits for policyholders (either using a blanket or more targeted approach).

5.1.2   LEVEL OF COVER

5.1.2.1   Over the past two decades, there has been limited change in the level of cover offered by the typical funeral policy. The feedback from the questionnaires answered by four of the largest insurers in the entry-level market in South Africa indicates that more than 75% of entry-level business still has sums assured of less than R20 000.

5.1.2.2   According to insurers, demand for higher sum assured funeral products over recent years has either been slight or absent. They describe the demand in the current environment for higher sum assured, non-underwritten products as being between low and medium, both from policyholders and intermediaries.

5.1.2.3   Most companies also believe that if higher sums assured were available at lower premiums in the entry-level market, policyholders would reduce premiums rather than increase sums assured so that overall premiums would reduce. Policyholders would spend less to cover their needs that are relatively stable and linked to funeral cost.

5.1.2.4   Companies assign limited elasticity to higher sums assured relative to premiums.

5.1.2.5   However, the lack of sum assured increases cannot only be ascribed to policyholders' lack of demand, but also to the risk of fraud in the entry-level market, resulting in companies not wanting to significantly increase sums assured.

5.1.2.6   In an environment where mortality experience continues to improve and where AIDS is becoming a reduced hazard, it is our view that insurers could be more proactive in product design and pricing by making some allowance for expected mortality improvements. We believe that the main hurdles to increased cover in the entry-level market could be addressed as a result of:
— availability/access: as the risk of AIDS mortality abates, companies could become more open to marketing funeral products with higher cover levels;
— underwriting: the use of post-sale underwriting and the potential increase in demand for underwritten products (as AIDS stigma reduces) could encourage companies to sell more products with higher levels of cover in the entry-level market;
— insurance terms: with increased life expectancy for HIV-positive individuals, risk rates are likely to become less penal and, as this becomes more widely recognised, the aversion to applying for higher cover (and having to undergo an AIDS test) may reduce; and
— limited incentives (e.g. surrender values or cashbacks): policyholders may be more open to purchasing a single policy with a higher sum assured instead of several regular-premium funeral policies from different providers if such a policy provides additional value in the

form of surrender values and cashbacks, which could be enhanced over time as experience improves.

5.1.3   SURRENDER VALUES AND CASHBACKS

5.1.3.1   It is the opinion of the researchers that the typical funeral policy that dominates the entry-level market at the time of writing is perceived as a 'one-way-bet' by policyholders. It is generally accepted that there is insufficient exposure to savings products in the entry-level market and where they are available, they offer less than satisfactory value for money.

5.1.3.2   The feedback from our questionnaires indicate that reductions in yield (RIY) for South African entry-level savings policies vary between 2.4% (longest term) and 3.8% (shortest policy term). This is well below the levels of 4.0% to 7.7% observed for these companies by Roth, Rusconi & Shand (2005) and indicates progress over the past eight years.

5.1.3.3   However, the levels are still high compared with the middle-income and affluent market. Our calculated RIY figures for an endowment wrapper investment policy on an investment platform from a large life company vary between 2% (longest term) and 2.3% (shortest policy term). It makes it very difficult in a low inflation environment to offer value for money when the RIY is a significant proportion of investment returns.

5.1.3.4   It is the opinion of the researchers that the environment created by improved mortality and the reduction in the risk of AIDS could create a significant opportunity to introduce a savings element to existing funeral policies at much more affordable levels than selling a free-standing savings policy. To the extent that in such an environment the mortality basis used for pricing such business in the past, and currently, is overly conservative, this will lead to insurer profits which could be used to fund enhanced cashback benefits or surrender values.

5.1.3.5   As illustrated in Section 4, it is possible to offer cashback benefits of between six and 21 months' office premium on policies with a 10% higher office premium without reducing new business margins. On our modelled portfolio of policies (which had a R2 376 average annual office premium after allowing for the 10% premium increase and an average sum assured of R17 750), this could imply an average lump-sum benefit to policyholders of between R2 574 and R4 158 every five years under more aggressive mortality and lapse assumptions. In addition to boosting consumption for clients, such lump-sum benefits also offer the opportunity of reinvestment into single premium savings vehicles.

5.1.3.6   In Section 4 we showed that a surrender value of 14% of premiums to date could be introduced on our modelled portfolio of funeral policies by increasing office premium by 10%. We have further shown that, in a more aggressive mortality scenario and under a lower lapse assumption (in years leading up to the surrender values first becoming payable), this surrender value could increase to between 30% and 56% of premiums paid to date. Based on our portfolio with an average sum assured of R17 750 and an average office premium of R2 376 p.a. (after a 10% increase to allow for a surrender value benefit), a surrender value of between R3 564 and R6 654 could start to accrue from year 5 onwards.

5.1.3.7   The benefits to policyholders from our example cashback and surrender value benefits could create meaningful savings opportunities for policyholders in this market.

In the case of a cashback benefit, policyholders could receive regular sizeable lump sums without forfeiting their life cover. Such amounts could be reinvested in other forms of savings or could be used to boost consumption or reduce debt repayments and other expenditures.

5.1.3.8   In both cases, there is the potential that persistency could improve for policyholders invested in such policies as a result of benefit enhancements. It is possible that the expectation of a cashback payment could reduce lapse rates in the period prior to the pay-out of such benefits, although they could again increase once the payment has been made. The build-up of a surrender value within a policy could reduce lapse rates during the first five years of a policy if such surrender value only starts accruing after a particular policy anniversary (say five years). However, once a surrender value is available, it may have a negative impact on persistency, but this would be at later durations which would be less of a problem than early lapses as it allows insurers to recoup their initial expenses.

5.2   Increased Penetration in the Entry-Level Market

5.2.1   It is our view that a more benign mortality environment will lead to increased penetration levels in the entry-level market in South Africa. This increase in penetration could occur via various mechanisms, including:

— The increase of sums assured by life offices: most of the respondents to our questionnaire have indicated that they have already, or will in the future, enhance benefits to reflect lower mortality experience (this would by definition increase penetration as measured by sum assured);

— The reduction of premiums by life offices: most of the respondents to our questionnaire have implemented some level of re-pricing in relation to new business in the entry-level market and have indicated that this will continue if mortality experience continues to improve—this allows more cover to be purchased for the same premium (although the impact could be muted by the limited elasticity to price in this market);

— Cashbacks on funeral policies: most of the respondents to our questionnaire have already introduced some form of cashback benefit to encourage persistency. Future mortality improvements may allow insurers to increase future cashbacks—the cash received by surviving policyholders could potentially find its way into increased insurance purchases; and

— New products could increase demand for insurance: enhanced benefits in the form of cash-backs, surrender values and premium waivers at retirement could increase the demand for products in the entry-level market and help to boost penetration.

5.2.2   An important consideration when it comes to the penetration levels in the entry-level market in South Africa is arguably marketing. Changes in products as discussed above are likely to have a limited impact on sales and penetration if they are not well marketed and promoted by the life offices and their intermediaries. Life offices need to make their products attractive to sell for their intermediaries.

5.2.3   A further consideration is the profit motive. There is a possibility that companies opt to allocate all mortality and lapse profits to shareholders instead of utilising

them to enhance policyholder benefits. We believe that companies should consider the longer-term impacts of their decisions, including possible social pressures, the potential growth of the market and the opportunity to change the experience dynamics within the entry-level market (further discussed below).

5.3   Improved Persistency in the Entry-Level Market

5.3.1   A key issue in the entry-level market in South Africa is persistency. Lapses on entry-level policies, especially funeral policies, have typically been much higher than for the rest of the insurance market, and it has been a key determinant of profitability in terms of new business margins, IFRS profit and EV profit. Lapse rates on funeral policies can be twice the rate on life policies in the middle- and upper-income market. For assistance business, the average individual lapse rate for in-force business over the five years ending December 2015 was 22%, compared to the corresponding figure for typical insurers of 12% (FSB, 2014–2016).

5.3.2   The above observed lapse rate for assistance business appears consistent with our new business model lapses. There are various reasons put forward for such high lapse/surrender rates, including:
— affordability (often as a result of job insecurity): when clients face financial constraint, they are often forced to lapse policies;
— aggressive marketing: new policies replace old policies that are lapsed;
— re-pricing of premiums: new policies replace existing policies; and
— lack of surrender value or cashback on policy: there is no additional incentive for policyholders to maintain their policies in times of financial difficulty.

5.3.3   We believe that at least two of the reasons above could be addressed in an environment of improved mortality and reduced risk of AIDS, namely affordability and the lack of surrender value or cashback. An improved mortality environment creates the potential for new business premiums to be re-priced to reflect improved experience, which increases affordability and should also reduce lapse risk in times of financial difficulty.

5.3.4   Where new policies are sold on better terms than existing policies, the terms of existing business would need to be adjusted to manage the risk lapse risk on this business.

5.3.5   As discussed in Section 4, improved persistency could then lead to significant enhancements to cashback and surrender value benefits, premium waiver and premium holiday benefits. It is our opinion that these benefit enhancements could in turn have a positive impact on persistency. There is therefore the potential for a cycle of positive reinforcement where lower premiums improve persistency, which allows insurers to offer enhanced benefits, which should in turn improve persistency experience. Persistency rates in the entry-level market could eventually improve to levels experienced in the traditional life assurance market in South Africa.

5.4   Increased Savings in the Entry-Level Market

5.4.1   The entry-level market in South Africa is dominated by risk policies, especially funeral policies with limited sales of savings products. The reasons for this state of affairs are a combination of lack of demand, lack of supply/marketing of products, lack of disposable income and poor value for money.

5.4.2   We believe that, in an improving mortality environment where there is a reduced risk of AIDS, many of the issues above could be addressed, paving a way for an increase in this type of product.

5.4.3   There are a number of mechanisms that could increase the demand and usage of savings products in the entry-level market in South Africa, including:

— Premium reductions of funeral policies could increase disposable income, freeing up more money for investment in savings products.
— Cashbacks could provide individuals with windfalls that could be reinvested into savings products, especially if life companies offer reduced charges compared to stand-alone saving policies.
— Providing surrender values on funeral products could provide these products with a savings element, which could be utilised when the policyholder is in financial difficulty or has a reduced need for life cover.
— Premium waivers at retirement age could provide some relief to offset loss of salary at retirement.
— To the extent that persistency experience improves and the benefits of this are passed to policyholders, this should lead to increased saving and consumption.

5.4.4   Our calculations in Section 4 have illustrated that premium rates could be as much as 11% lower under the more aggressive mortality assumptions of our baseline scenario, assuming no changes in lapses. We estimate that the entry-level new business recurring premiums in the South African insurance industry were between R10 bn and R11 bn during 2015,[27] whilst the total entry-level recurring premiums for the industry is estimated at between R22 bn and R24 bn during the same period. If premium reductions of 11% were to materialise in the South African entry-level market over time in line with our runs, this could imply the freeing up of between R0.9 bn and R2.1 bn in premiums per annum (assuming no change in lapse profile). The gross savings rate for households in 2015 was only R8 bn with net savings being a large negative (SARB, 2014). A boost of savings of only R0.8 bn p.a. would boost gross household savings by 10%.

5.4.5   In Section 4 we illustrated how improved future mortality experience assumptions could fund enhanced cashback benefits: for our portfolio of new business policies with an average office premium of R2 376 p.a., cashbacks of between R2 574 and R4 158 could be released on a per policy basis every five years, with the higher releases being dependent on improved persistency. Such cashbacks could be reinvested in savings products.

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27 Estimate based on company financial statements. Data provided by participants with pro-rata adjustment after referencing assistance business figures from FSB annual reports 2001–2014

5.4.6 In the same section, we also considered funeral policies with surrender values and illustrated that surrender values of between 30% and 56% of premiums could be provided, depending on improvement in mortality and lapse experience assumed. Using our estimate of total entry-level recurring premiums of between R22 bn and R24 bn[28] and a 40% surrender value level, this implies a potential boost to savings from these policies of between R8.8 bn and R9.6 bn over time, which could be meaningful (more than total household gross savings).

6. SUMMARY AND CONCLUSIONS

6.1 Over the past seven years, the entry-level insurance market in South Africa has been an important source of growth for the insurance industry and for many individual insurers. We estimate that the proportion of new recurring premiums from the entry-level market increased from around 40% to over 50% by 2014, with more than 50% of value of new business now coming from this source for the largest insurers.[29]

6.2 We believe that an improving mortality environment provides entry-level insurers with the opportunity to improve premium rates and enhance benefits without sacrificing new business margins, thereby ensuring continued new business growth. We believe that this could also provide strong potential for penetration to increase in the entry-level market. Furthermore, new and innovative product designs (as a result of mortality improvements amongst other things) have the potential to improve persistency in the entry-level market, as well as to increase sales of savings products. As a result, we believe that South African life offices could also benefit from healthy earnings and value of in-force business growth from the entry-level market in future years.

6.3 In addition to benefiting South African life offices, it is our opinion that the improving mortality environment should benefit individuals in the entry-level market. We see the potential for such individuals to receive greater cover, better value for money and exposure to a wider variety of products. The positive impacts on life offices and their clients are also expected to have a secondary positive impact on South Africa as a whole through, for example, the potential for higher savings, higher consumption and reduced financial hardship due to the death of bread winners.

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28 Ibid.

29 Clientele Life, Liberty Life, Metropolitan Life/MMI, Old Mutual, and Sanlam company financial statements, 2010–2015

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APPENDIX A—ASSUMPTIONS FOR MODEL PORTFOLIO

A.1   Mortality Assumptions

Our mortality tables have been based on the THEMBISA model; we highlight selected mortality rates below.

TABLE A.1. Sample of mortality rates used

Age	Conservative Male 2013+	Conservative Female 2013+	Baseline Male 2013	Baseline Male 2018	Baseline Male 2023	Baseline Female 2013	Baseline Female 2018	Baseline Female 2023	CD4 500 Male 2013	CD4 500 Male 2018	CD4 500 Male 2023	CD4 500 Female 2013	CD4 500 Female 2018	CD4 500 Female 2023
20	0.36%	0.21%	0.35%	0.36%	0.35%	0.21%	0.21%	0.20%	0.35%	0.36%	0.36%	0.21%	0.20%	0.19%
25	0.59%	0.42%	0.58%	0.55%	0.55%	0.40%	0.31%	0.30%	0.58%	0.55%	0.54%	0.40%	0.27%	0.26%
30	0.89%	0.65%	0.87%	0.69%	0.64%	0.60%	0.38%	0.33%	0.87%	0.67%	0.62%	0.60%	0.33%	0.28%
35	1.27%	0.80%	1.21%	0.86%	0.72%	0.71%	0.45%	0.37%	1.21%	0.83%	0.68%	0.71%	0.41%	0.33%
40	1.55%	0.90%	1.46%	1.07%	0.90%	0.81%	0.57%	0.48%	1.46%	1.04%	0.86%	0.81%	0.54%	0.46%
45	1.78%	1.09%	1.68%	1.32%	1.18%	1.01%	0.73%	0.66%	1.68%	1.30%	1.15%	1.01%	0.71%	0.64%
50	2.12%	1.30%	2.04%	1.71%	1.59%	1.25%	0.94%	0.84%	2.04%	1.70%	1.58%	1.25%	0.93%	0.83%
55	2.63%	1.60%	2.56%	2.26%	2.13%	1.56%	1.27%	1.12%	2.56%	2.25%	2.13%	1.56%	1.26%	1.12%
60	3.21%	2.00%	3.17%	2.91%	2.77%	1.98%	1.76%	1.58%	3.17%	2.91%	2.76%	1.98%	1.76%	1.58%
65	4.15%	2.49%	4.13%	3.94%	3.77%	2.48%	2.33%	2.14%	4.13%	3.94%	3.77%	2.48%	2.33%	2.15%
70	6.02%	3.46%	6.01%	5.95%	5.86%	3.45%	3.38%	3.23%	6.01%	5.95%	5.86%	3.45%	3.38%	3.24%

A.2   Economic Assumptions

Economic assumptions have been set with reference to public information, questionnaire responses, discussions with life offices and own judgement:

— Interest rate: risk free rate (JSE zero coupon yield curve);

— Inflation rate: inflation curve derived from JSE nominal and real curves; and

— Risk discount rate: risk free rate + 2.5%.

A.3   Other Assumptions

Our other assumptions have been based on publicly available information, questionnaire responses, discussions with life offices and own judgement.

TABLE A.2. Summary of lapse assumptions

Duration	Lapse rate p.a.
Year 1	35%
Year 2	24%
Year 3	15%
Year 4	10%
Year 5+	10%

TABLE A.3. Summary of expense assumptions

Initial expense	R900 per policy
Renewal expense	R200 p.a. per policy
Claims expense	R500 per claim

Other assumptions are as follows:

— Commission: maximum regulated commission paid upfront (with clawback)

— Cost of capital: 10% of the present value of future profits

— Discretionary margins: none

— Percentage of premiums not received (due to premium holidays): 10%

A.4   Policy Set

For our policy set, we have used feedback from our questionnaires and additional discussions with life offices. We have taken account of the age, gender and sum-assured distributions provided to us by the different life offices to derive a typical picture that is not representative of a single company.

The characteristics of the model points are summarised below.

TABLE A.4. Model points

Average age	
Main member	40.3
Spouse	41.3
Children	11.4
Parents	62.9
Extended family	30.3
Average sum assured	R17 750
Average premium	R2 160
Male / female ratio	50%
Dependant ratio (dependants per main member)	
Spouse	0.2
Children	0.85
Parents	0.25
Extended family	0.9

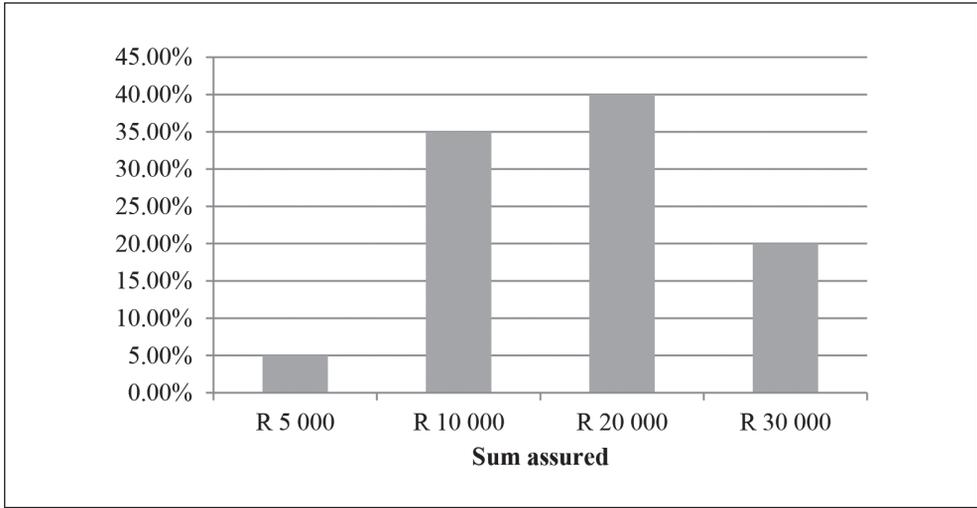FIGURE A.1. Age distribution profile, for males and females separately)

FIGURE A.2. Assumed sum-assured distribution profile

APPENDIX B—GLOSSARY

ART	Antiretroviral treatment
ASSA2008	ASSA AIDS and Demographic Model
Baseline scenario	Mortality scenario derived from THEMBISA based on government policy, which provided ART to all adults who have a CD4 count of 350 cells/μl
CD4 count	Number of CD4 cell present in a blood sample, measured in cells/μl
CD4 <500 scenario	Mortality scenario derived from THEMBISA based on the current government policy (starting in January 2015), which allows for ART roll-out to be expanded to include all adults with CD4 count of 500 cells/μl
Conservative scenario	Mortality scenario derived from THEMBISA, which is our estimate of the current basis being used by the South African life insurance industry for pricing and reserving
Death rate	Number of deaths as a proportion of population
DoH	Department of Health
Entry-level policies	Policies with low sums assured, typically non-underwritten and mostly funeral products
EV	Embedded value
PMTCT	Prevention of Mother to Child Transmission
Post-sale underwriting	Offering enhanced benefits to policyholders that exhibit better mortality experience than had been priced for in the original contract
PVNBP	Present value of new business premiums
NB margin	VNB/PVNBP
NSP	National Strategic Plan
RIY	Reduction in Yield
RMS	Rapid Mortality Surveillance (RMS) Report
THEMBISA	Integrated demographic and epidemiological model of the South African HIV/AIDS epidemic
VNB	Value of new business