ASISA

The South African insurance gap (2019)

Quantifying the insurance gap by considering the financial impact on South African households of the death or disability of an earner in the household

Final Report

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TRUE SOUTH

ACTUARIES & CONSULTANTS

A study by True South Actuaries & Consultants

1 INTRODUCTION

1.1 Definitions

Terms for which a definition is supplied in Appendix A, are denoted in italics.

1.2 Background and brief

ASISA retained True South Actuaries and Consultants to update previous studies conducted to determine the extent of under-insurance in South Africa. This study is referred to as the "2019 Insurance Gap Study" and reflects the situation as at the end of 2018. Previous studies were conducted in 2007, 2010, 2013 and 2016 and reflected the extent of under-insurance in South Africa as at the end of 2006, 2009, 2012 and 2015 respectively.

1.3 Acknowledgements

We express our thanks to the life insurers who participated in the study through the provision of data on fairly tight timelines. We experienced much improvement in both the quality and quantity of data compared to the previous studies. We are also particularly grateful for the many instances where senior officials in the respective organizations got personally involved to assist us in securing the necessary data.

1.4 What is included and what is excluded

In Appendix A (defining terms that are denoted in italics throughout this document), the *insurance gap* (see modelling notes in Appendix B) is defined as the difference between the *insurance need* and *actual cover*:

- The *insurance need* is defined as the amount of cover required to meet the need that is created by the *death event* and/or the *disability event* (see modelling notes in Appendix C):
  - It assumes the household would want to maintain the pre-event standard of living.
  - It further assumes that the need extends to the deceased / disabled household member's *retirement age* only as this study doesn't express any view on post-retirement provision adequacy.
  - It excludes any additional short-term expenses related to the risk event, such as funeral costs, medical costs and/or cost of structural changes to one's home in the case of a *disability event*.

- *Actual cover* considers benefits received post-event from insurers (retail and group-type cover), self-insurance pension schemes (like the GEPF) and government disability grants. (See modelling notes in Appendix D.)
  - It excludes funeral cover (as it is pragmatically assumed that the objective of such cover does not include income replacement).
  - It excludes cover that provides for certain selected situations only, such as accident only cover and cover from the Road Accident Fund, the Compensation Fund and short-term insurance.
  - It ignores any shortfall that may result due to any waiting periods that may be enforced by the disability cover product design.

2 EXECUTIVE SUMMARY

2.1 Number of *death events / disability events* expected

The table below shows the number of *earners* expected to suffer a *death event*[1] and / or a *disability event*[2] during 2019:

Table 1 - Number of earners suffering a death and/or disability event in 2019

	Death event	Disability event
Number of *earners*	15.6m	15.6m
Number of events expected per year	155 950	51 642
Number of events expected per day	427	141

2.2 The *insurance gap*

At a macro level

The *insurance gap* was determined using the same principles as used for previous studies. (See appendices B, C and D.) The *insurance gap* as at the end of 2018 was calculated to be 34.7 trillion (1 trillion = 1 000 billion = 1 000 000 million = 10^{12}):

- If South African households wanted to maintain their standards of living after a *death event*, the *insurance need* for all *earners* combined is in the region of R24.5 trillion (see section 3.1). The extent of *actual cover* in force in the economy only amounts to R9.0 trillion (This leaves a death *insurance gap* of around R15.4 trillion (see section 3.3).

- If South African households wanted to maintain their standards of living after a *disability event*, the *insurance need* for all *earners* combined is in the region of R35.6 trillion (see section 3.1). The extent of *actual cover* in force in the economy only amounts to R16.4 trillion (see section 3.2). This leaves a disability *insurance gap* of around R19.3 trillion (see section 3.3).

(Numbers are rounded.)

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[1] By reference to the demographics of the *earners* in each segment and application of the AIDS model of the Actuarial Society of South Africa.

[2] By reference to a disability investigation of the Actuarial Society of South Africa calibrated so that ratio of disabilities to deaths is consistent with group premium rates obtained.

The *insurance gap* as at the end of 2018 was calculated to be R2.2m for the average South African *earner*:

- If the average South African *earner* wanted to ensure that her/his family can maintain their standard of living in the event of her/his death, provision would need to be made for R1.6m of cover. However, the average South African *earner* has life cover of just less than R0.6m. This leaves an average death *insurance gap* of about R1.0m.
- If the average South African *earner* wanted to ensure that her/his family can maintain their standard of living in the event of her/his being subject to a *disability event*, provision would need to be made for R2.3m of cover. As the average South African *earner* has disability cover of just less than R1.1m, this leaves an average disability *insurance gap* of about R1.2m.

2.3   Responses to the insurance gap

A response to the *insurance gap,* could be to pro-actively purchase additional death and disability cover.

Reactive responses (post the *death event / disability event*) include [1] curtailing household expenditure and [2] shifting the burden of under-insurance to the remaining household members of working-age by requiring increased contributions from them to total household income. The extent required by each of the responses is summarised in the table below:

Table 2 - Possible responses to the insurance gap

	Pro-active	Reactive post *death event / disability event*	
	Cost to close gap (% of *earnings*)	% reduction in household expenditure	Generating additional income per month
Death event	**4.6%**	**32%[3]**	**5 362**
Disability event	**2.6%**	**24%**	**6 475**
Total	**7.2%**		

2.4   The *insurance gap* broken down into segments

In the main body of this document, the insurance gap is reported for different segments of the population in terms of income, education, age, province and gender.

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[3] Expressed as a percentage of post event household expenditure (i.e. reduced due to smaller family size).

3 INCREASE IN THE *INSURANCE GAP* SINCE THE PREVIOUS STUDY

3.1 The *insurance need* grew by 6.9% pa

In the table below, the *insurance need* is expressed as the product of three numbers:

Table 3 – Three components combine to define the insurance need

	Note	Total *insurance need* (in R'bn) 2016 study		Total *insurance need* (in R'bn) 2019 study	
		Death	Disability	Death	Disability
Total income at risk	1	2 079	2 079	2 863	2 863
* Replacement ratio	2	64%	87%	57%	78%
* Capitalisation factor	3	15.2	16	15.1	15.9
Insurance need	**1*2*3**	**20 249**	**28 936**	**24 488**	**35 654**

Note 1 - Income at risk: This includes all income as per the definition (Appendix A) of *earnings*. (For more information, see Appendix C1.)

Note 2 - Replacement ratio: This represents the proportion of household members' personal income that "will be missed" after the *death event* or the *disability event*. The replacement ratio is lower for the *death event* reflecting the fact that the deceased *earner*'s portion of expenses will no longer be part of the household budget. The replacement ratios are lower compared to the previous study. This is mostly related to higher tax as percentage of pre-tax income due to [1] increase in collections by SARS (exceeding 10% per annum), [2] fiscal creep, [3] higher tax rates and [4] the introduction of the 45% tax bracket for earnings above R1.5m pa. (For more information, see Appendix C2.)

Note 3 - Capitalisation factor: This factor is related to the number of years that the *earner* would still have contributed to the household. It reflects the period from current day up to *retirement age*. (For more information, see Appendix C3.)

3.2   *Actual cover* grew by 7.7% pa

Recently introduced regulatory returns now form the basis of the *actual cover* information requirement, serving to enhance the credibility of results in at least two ways:

- Higher response rates: As the requested information is more readily available, (the bulk had already been provided to the regulator), more insurers respond to the information request resulting in a lesser need to ratio data to account for non-respondents.
- Quality and comparability of information: Returns are audited and the specification for what is required is uniform for all insurers alike. There is therefore less possibility for interpretation / data extraction errors.

See Appendix D for more information on the sources used for determining the total level of *actual cover* in the market and allocating this to different segments of the *earner* population.

Table 4 - Total actual cover held relative to previous study

Actual cover in R'bn	Note	2016 study	2019 study	Increase pa
Life cover	1	7 392	9 042	6.9%
Disability insurance cover	2	9 932	12 500	8.0%
Disability grants	3	3 041	3 895	8.6%
Total		20 365	25 437	7.7%

Note 1: Growth in life cover since previous study

Table 5 - Growth in life cover, split between retail and group insurance

Actual life cover in R'bn	2016 study	2019 study	Increase pa
Retail insurance	4 312	5 689	9.7%
Group insurance	3 080	3 353	2.9%
Total life insurance cover	7 392	9 042	6.9%

Note 2: Growth in disability cover since previous study

Table 6 - Growth in disability cover, split between retail and group insurance

Actual disability cover in R'bn	2016 study	2019 study	Increase pa.
Retail insurance	3 487	4 722	10.6%
Group insurance	6 445	7 779	6.5%
Total disability insurance cover	9 932	12 500	8.0%

Note 3: The amount of the maximum social security disability grant increased by about 6% pa since the 2016 study. However, the number of earners also increased and thus the total cover available in the scenario where all earners become disabled has increased by more than 6%.

3.3 The total *insurance gap* increased by 6.4% pa

Table 7 - Insurance gap: Comparison against previous study

R'billion	2016 study			2019 study		
	Death	Disability	Total	Death	Disability	Total
Insurance need	20 249	28 936	49 185	24 488	35 654	60 142
Actual cover from insurance	-7 392	-9 932	-17 324	-9 042	-12 500	-21 542
Disability grant cover	-	-3 041	-3 041	-	-3 895	-3 895
Insurance gap	12 857	15 963	28 820	15 446	19 259	34 705
Cover adequacy	37%	45%	41%	37%	46%	42%

Since the previous study in 2016, the *insurance gap* increased by 6.4% pa. The *actual cover* as percentage of the *insurance need* (referred to as *cover adequacy*) indicates that only 42% of the *insurance need* is currently met by *actual cover*. This percentage remained fairly flat since the previous studies due to both the *insurance need* and *actual cover* growing at similar rates over these periods.

The death *insurance gap* grew at a marginally slower rate (6.3% pa) than the disability *insurance gap* (6.5% pa).

4 PERSONALISING THE *INSURANCE GAP*

4.1 The *insurance gap* per *earner*

The table below shows how the *insurance gap* of R34.7 trillion can be expressed as an average gap of R2.2m per South African *earner* (R1.0m for *death events* and R1.2m for *disability events*):

Table 8 - Insurance gap in total for all earners and per-earner

	Total *insurance gap* (in R'bn)		*Insurance gap* per earner – (in Rand)	
	Death	Disability	Death	Disability
Insurance need	**24 488**	**35 654**	**1 570 843**	**2 287 134**
Total income at risk	2 863	2 863	183 649	183 649
* Replacement ratio	57%	78%	57%	78%
* Capitalisation factor	15.1	15.9	15.1	15.9
Actual cover	**-9 042**	**-16 395**	**-580 012**	**-1 051 689**
Retail insurance	-5 689	-4 722	-364 917	-302 877
Group insurance	-3 353	-7 779	-215 094	-498 982
Government grants	0	-3 895	-	-249 830
Insurance gap	**15 446**	**19 259**	**990 831**	**1 235 445**

In the case of a *death event*

If the average South African *earner* wanted to ensure that her/his family can maintain their standard of living in the event of her/his death, provision would need to be made for R1.6m of cover. However, the average South African *earner* has life cover of just less than R0.6m. This leaves an average death *insurance gap* of about R1.0m.

In the case of a *disability event*

If the average South African *earner* wanted to ensure that her/his family can maintain their standard of living in the event of her/his being subject to a *disability event*, provision would need to be made for R2.3m of cover. However, the average South African *earner* has disability cover of just less than R1.1m. This leaves an average disability *insurance gap* of about R1.2m.

4.2 Responses to the *insurance gap*

A response to the *insurance gap,* could be to pro-actively purchase additional death and disability cover.

Reactive responses (post the *death event / disability event*) include [1] curtailing household expenditure and [2] shifting the burden of under-insurance to the remaining household members of working-age by requiring increased contributions from them to total household income.

The table below indicates the extent required by each of these responses:

Table 9 - Possible responses to the insurance gap

Personal monthly income (net of tax)	Pro-active	Reactive post *death event / disability event*	
	Cost to close gap (% of *earnings*)	% reduction in household expenditure	Generating additional income per month
Death event	4.6%	32%	5 362
Disability event	2.6%	24%	6 475
Total	7.2%		

4.3 Further personalising the *insurance gap*

Due to the diversity of the South African socio-economic landscape, the concept of the "average South African *earner*" is less clear than (say) the "average Australian earner". For this reason, it makes sense to consider the *insurance gap* for different segments of the South African *earner* population.

In the sections below we show the insurance gap and possible responses to it for the following segments of the South African *earner* population:

- Section 5: Earnings groups
- Section 6: Level of education
- Section 7: Age groups
- Section 8: Province
- Section 9: Gender

5 THE *INSURANCE GAP* PER *EARNINGS* GROUP

5.1 Segments

The 15.6 million *earners* were divided into 5 groups with equal representation by number. The first group represented the 20% poorest individuals within the universe of *earners*. The next group represented the next 20% poorest individuals, etc.:

Table 10 – Demographics of earners in each of the earning segments

Segment	Segment bounds (net *earnings*)	Number of *earners* (million)	Average annual net *earnings* (Rand)	Average Age
Poorest 20%	up to R28 056 p.a.	3.1	14 416	36
2nd Quantile	R28 057 to R55 983 p.a.	3.1	42 249	36
3rd Quantile	R55 984 to R102 507 p.a.	3.1	76 225	37
4th Quantile	R102 508 to R213 086 p.a.	3.1	165 289	38
Richest 20%	more than R213 087 p.a.	3.1	619 859	42
All		**15.6**	**183 649**	**38**

5.2 Findings

The numbers in the remainder of this section reveal that:

- For a *death event*, the *cover adequacy* shows a strong positive correlation with personal income - i.e. the higher the income, the bigger proportion of the *insurance need* is met by *actual cover*.

- This would have been the case for the *disability event* as well had it not been for government disability grants. The level of the grant is such that it covers the full disability *insurance need* of the poorest 20% *earners*. Most *earners* within this (poorest 20%) group would therefore not have any need for additional (or any for that matter) disability insurance cover.

5.3 The size of the *insurance gap* per segment

Death *insurance gap* per *earner*

Table 11 - Derivation of the per-earner death insurance gap by earnings

	Poorest 20%	2nd Quantile	3rd Quantile	4th Quantile	Richest 20%
Insurance need	**114 277**	**477 814**	**899 025**	**1 725 555**	**4 636 170**
Total income at risk	14 416	42 249	76 225	165 289	619 859
* Replacement ratio	43%	61%	66%	61%	54%
* Capitalisation factor	18.6	18.5	18.0	17.0	13.8
Actual cover	**-3 363**	**-29 767**	**-131 022**	**-409 203**	**-2 325 853**
Retail insurance	-792	-8 078	-48 853	-217 775	-1 548 502
Group insurance	-2 572	-21 689	-82 169	-191 428	-777 351
Government grants	0	0	0	0	0
Insurance gap	**110 913**	**448 046**	**768 004**	**1 316 352**	**2 310 318**
Cover adequacy (Cover/Need)	**3%**	**6%**	**15%**	**24%**	**50%**
Number of *earners* (millions)	3.1	3.1	3.1	3.1	3.1
Total *insurance gap* (R'bn)	346	1 397	2 395	4 102	7 206

For example, an *earner* that finds her/himself in the top 20% of South African *earners,* would typically need life cover of almost R4.6m. Typically such an *earner* would only have life cover of R2.3m, leaving an average *insurance gap* of around R2.3m.

Disability *insurance gap* per *earner*

Table 12 - Derivation of the per-earner disability insurance gap by earnings

	Poorest 20%	2nd Quantile	3rd Quantile	4th Quantile	Richest 20%
Insurance need	**275 820**	**803 739**	**1 399 375**	**2 618 160**	**6 336 803**
Total income at risk	14 416	42 249	76 225	165 289	619 859
* Replacement ratio	100%	100%	99%	90%	71%
* Capitalisation factor	19.1	19.0	18.6	17.7	14.4
Actual cover	**-456 790**	**-452 035**	**-542 118**	**-809 761**	**-2 996 782**
Retail insurance	-361	-4 220	-34 304	-170 181	-1 304 819
Group insurance	-7 898	-65 935	-240 775	-531 933	-1 647 858
Government grants	-448 531	-381 880	-267 038	-107 646	-44 106
Insurance gap	**-180 970**	**351 704**	**857 257**	**1 808 399**	**3 340 020**
Cover adequacy (Cover/Need)	**> 100%**	**56%**	**39%**	**31%**	**47%**
Number of *earners* (millions)	3.1	3.1	3.1	3.1	3.1
Total *insurance gap* (R'bn)	-564	1 097	2 673	5 636	10 418

For example, the 20% poorest South African *earners* would typically need disability cover of about R0.3m. Typically such an *earner* would have disability cover far exceeding this need, mostly due to government grants leaving no *insurance gap*.

5.4 Responses to the *insurance gap*

Death *insurance gap*

The table below gives (for each of the segments) the degree of intervention required for each of three possible responses to the *insurance gap* in the case of a *death event*:

Table 13 - Responses to the death insurance gap by earnings

		Poorest 20%	2nd Quantile	3rd Quantile	4th Quantile	Richest 20%	**All**
Purchase additional Insurance	Cost of insurance (as % of current *earnings*)	6.7%	9.2%	8.7%	6.9%	3.1%	**4.6%**
	Increase in current level of cover (e.g. 1.5x implies additional cover required equal to 1.5 times current level)	33.0	15.1	5.9	3.2	1.0	**1.7**
Reduce household expenditure	Required reduction in household expenditure	11%	31%	39%	36%	32%	**32%**
Additional income required	Extra income required per month (net of tax)	600	2 424	4 156	7 123	12 502	**5 362**
	Extra income as % of *earnings* pre-event	50%	69%	65%	52%	24%	**35%**

Disability *insurance gap*

For a *disability event*, the figures are as follows:

Table 14 - Responses to the disability insurance gap by earnings

		Poorest 20%	2nd Quantile	3rd Quantile	4th Quantile	Richest 20%	**All**
Purchase additional Insurance	Cost of insurance (as % of current *earnings*)	-4.8%	3.2%	4.3%	4.2%	2.1%	**2.6%**
	Increase in current level of cover (e.g. 1.5x implies additional cover required equal to 1.5 times current level)	-0.4	0.8	1.6	2.2	1.1	**1.2**
Reduce household expenditure	Required reduction in household expenditure	-12%	17%	30%	33%	25%	**24%**
Additional income required	Extra income required per month (net of tax)	-948	1 843	4 493	9 478	17 505	**6 475**
	Extra income as % of *earnings* pre-event	-79%	52%	71%	69%	34%	**42%**

6 THE *INSURANCE GAP* PER EDUCATION LEVEL

6.1 Segments

Each *earner* is allocated to one of five education categories depending on the highest level of education achieved:

- PS or lower: Primary school not completed

- Some HS: Completed primary school, but not high school.

- Matric: Completed high school, but no diploma or degree

- Diploma: Diploma but no degree

- Degree: Degree or more.

Table 15 - Demographics of earners in each of the education segments

Segment	Number of *earners* (million)	Average annual *earnings* (Rand)	Average Age
PS or lower	1.7	57 476	44
Some HS	5.7	95 547	37
Matric	5.5	158 403	35
Diploma	0.9	333 606	39
Degree	1.8	583 346	41
All	**15.6**	**183 649**	**38**

6.2 Findings

The numbers in the remainder of this section reveal that:

- For the *death event*, the *cover adequacy* shows a strong positive correlation with highest level of education achieved.

- This would have been the case for the *disability event* as well had it not been for government grants. These grants are targeted at the poor where there is a bias to lower levels of education.

6.3 The size of the *insurance gap* per segment

The tables below highlight how different the *insurance gap* is for the different segments. We show figures for the "average *earner*" within each segment.

Death *insurance gap* per *earner*

Table 16 - Derivation of the per earner death insurance gap by education

	PS or lower	Some HS	Matric	Diploma	Degree
Insurance need	**453 342**	**926 578**	**1 595 528**	**2 700 806**	**4 027 779**
Total income at risk	57 476	95 547	158 403	333 606	583 346
* Replacement ratio	65%	62%	60%	55%	51%
* Capitalisation factor	12.2	15.6	16.9	14.7	13.6
Actual cover	**-60 033**	**-162 198**	**-413 422**	**-1 233 804**	**-2 572 012**
Retail insurance	-26 445	-78 292	-250 463	-772 065	-1 735 646
Group insurance	-33 588	-83 906	-162 959	-461 739	-836 366
Government grants	0	0	0	0	0
Insurance gap	**393 309**	**764 380**	**1 182 106**	**1 467 002**	**1 455 767**
Cover adequacy (Cover/Need)	**13%**	**18%**	**26%**	**46%**	**64%**
Number of *earners* (millions)	1.7	5.7	5.5	0.9	1.8
Total *insurance gap* (R'bn)	681	4 339	6 458	1 354	2 615

For example, *earners* with matric as highest qualification would typically need life cover of almost R1.6m. Typically such an *earner* would only have cover of R0.4m, leaving an *insurance gap* of R1.2m – implying that only 26% of the life *insurance need* is protected by *actual cover*.

Table 17 - Derivation of the per-earner disability insurance gap by education

	PS or lower	Some HS	Matric	Diploma	Degree
Insurance need	**682 876**	**1 369 566**	**2 310 572**	**3 949 686**	**5 806 854**
Total income at risk	57 476	95 547	158 403	333 606	583 346
* Replacement ratio	93%	87%	82%	77%	70%
* Capitalisation factor	12.8	16.4	17.7	15.4	14.3
Actual cover	**-340 646**	**-559 323**	**-890 051**	**-1 909 205**	**-3 343 644**
Retail insurance	-17 151	-57 739	-205 806	-713 156	-1 437 218
Group insurance	-59 993	-189 777	-424 904	-1 075 794	-1 827 968
Government grants	-263 501	-311 807	-259 340	-120 254	-78 458
Insurance gap	**342 230**	**810 242**	**1 420 522**	**2 040 481**	**2 463 210**
Cover adequacy (Cover/Need)	**50%**	**41%**	**39%**	**48%**	**58%**
Number of *earners* (millions)	1.7	5.7	5.5	0.9	1.8
Total *insurance gap* (R'bn)	592	4 599	7 761	1 883	4 425

For example, an *earner* with at least a degree, would typically need disability cover of about R5.8m. Typically, such an *earner* would only have cover of R3.3m, leaving a substantial *insurance gap* of R2.5m – implying that 58% of the disability *insurance need* is protected by *actual cover*.

6.4   Responses to the *insurance gap*

Death *insurance gap*

The table below gives (for each of the segments), the degree of intervention required for each of three possible responses to the *insurance gap* in the case of a *death event*:

Table 18 - Responses to the per-earner death insurance gap by education

		PS or lower	Some HS	Matric	Diploma	Degree	**All**
Purchase additional insurance	Cost of insurance (as % of current *earnings*)	5.9%	6.9%	6.4%	3.6%	2.1%	**4.6%**
	Increase in current level of cover (e.g. 1.5x implies additional cover required equal to 1.5 times current level)	6.6	4.7	2.9	1.2	0.6	**1.7**
Reduce household expenditure	Required reduction in household expenditure	31%	40%	39%	30%	20%	**32%**
Additional income Required	Extra income required per month (net of tax)	2 128	4 136	6 397	7 938	7 878	**5 362**
	Extra income as % of *earnings* pre-event	44%	52%	48%	29%	16%	**35%**

Disability insurance gap

For the *disability event*, the figures are as follows:

Table 19 - Responses to the per-earner disability insurance gap by education

		PS or lower	Some HS	Matric	Diploma	Degree	**All**
Purchase additional insurance	Cost of insurance (as % of current *earnings*)	2.4%	3.3%	3.4%	2.3%	1.6%	**2.6%**
	Increase in current level of cover (e.g. 1.5x implies additional cover required equal to 1.5 times current level)	1.0	1.4	1.6	1.1	0.7	**1.2**
Reduce household expenditure	Required reduction in household expenditure	18%	28%	30%	24%	17%	**24%**
Additional income required	Extra income required per month (net of tax)	1 794	4 247	7 445	10 694	12 910	**6 475**
	Extra income as % of *earnings* pre-event	37%	53%	56%	38%	27%	**42%**

7 THE *INSURANCE GAP* PER AGE GROUP

7.1 Segments

Earners were categorised based on their age last birthday:

Table 20 – Demographics of earners in each of the considered age segments

Segment	Number of *earners* (million)	Average annual *earnings* (Rand)	Average Age
Under 30	4.3	106 682	25
30-39	4.7	164 085	34
40-49	3.8	240 728	44
50-54	1.4	234 560	52
55 and over	1.4	281 092	58
All	**15.6**	**183 649**	**38**

7.2 Findings

The numbers in the remainder of this section reveal that *cover adequacy* is lowest at the younger ages. *Earners* in the older age categories (55+) tend to be over-insured because the *insurance need* is more likely to be lower than the *actual cover:*

- *Insurance need*: As mentioned earlier, calculations assume that an *insurance need* only exists up to intended *retirement age*. As such, the *insurance need* for older *earners* is a much smaller multiple to current *earnings* compared to younger *earners*. This is evidenced in the capitalisation factors in the table below.
- *Actual cover*: Lump sum benefits do not take into account the diminishing need for insurance with increasing age.

7.3   The size of the *insurance gap* per segment

The tables below highlight how different the *insurance gap* is for the different age-group segments. We show figures for the "average *earner*" within each segment:

Death *insurance gap* per *earner*

Table 21 - Derivation of the per-earner death insurance gap by age

	Under 30	30-39	40-49	50-54	55 and over
Insurance need	**1 571 152**	**1 876 961**	**1 846 545**	**954 143**	**400 222**
Total income at risk	106 682	164 085	240 728	234 560	281 092
* Replacement ratio	57%	57%	57%	55%	54%
* Capitalisation factor	25.6	20.1	13.4	7.4	2.6
Actual cover	**-151 588**	**-464 548**	**-952 768**	**-848 910**	**-1 008 324**
Retail insurance	-77 717	-276 540	-617 208	-559 294	-668 280
Group insurance	-73 871	-188 008	-335 560	-289 616	-340 044
Government grants	0	0	0	0	0
Insurance gap	**1 419 564**	**1 412 412**	**893 776**	**105 232**	**-608 102**
Cover adequacy (Cover/Need)	**10%**	**25%**	**52%**	**89%**	**> 100%**
Number of earners (millions)	4.3	4.7	3.8	1.4	1.4
Total *insurance gap* (R'bn)	6 134	6 605	3 411	145	-849

For example, an *earner* aged between 30 and 39 typically needs R1.9m of life cover to ensure the household can maintain its standard of living after her/his death. Typically, such an *earner* would have life cover of less than R0.5m, leaving an average *insurance gap* of more than R1.4m.

Disability *insurance gap* per *earner*

Table 22 - Derivation of the per-earner disability insurance gap by age

	Under 30	30-39	40-49	50-54	55 and over
Insurance need	**2 402 530**	**2 738 752**	**2 523 175**	**1 390 648**	**657 733**
Total income at risk	106 682	164 085	240 728	234 560	281 092
* Replacement ratio	86%	81%	75%	75%	74%
* Capitalisation factor	26.1	20.6	13.9	7.9	3.1
Actual cover	**-905 424**	**-1 192 387**	**-1 316 088**	**-830 536**	**-528 970**
Retail insurance	-95 052	-284 231	-516 787	-411 801	-316 347
Group insurance	-385 705	-625 611	-644 059	-337 523	-188 415
Government grants	-424 667	-282 544	-155 241	-81 211	-24 208
Insurance gap	**1 497 106**	**1 546 365**	**1 207 087**	**560 112**	**128 763**
Cover adequacy (Cover/Need)	**38%**	**44%**	**52%**	**60%**	**80%**
Number of *earners* (millions)	4.3	4.7	3.8	1.4	1.4
Total *insurance gap* (R'bn)	6 469	7 232	4 606	772	180

For example, an *earner* that is younger than 30 typically needs R2.4m of disability cover to ensure the household can maintain its standard of living after her/his disability. On average, such an *earner* has life cover of around R0.9m, leaving an *insurance gap* of R1.5m.

7.4 Responses to the *insurance gap*

Death *insurance gap*

The table below gives (for each of the segments) the degree of intervention required for each of three possible responses to the i*nsurance gap* in the case of a *death event*:

Table 23 - Responses to the death insurance gap by age segments

		Under 30	30-39	40-49	50-54	55 and over	**All**
Purchase additional Insurance	Cost of insurance (as % of current *earnings*)	12.1%	7.1%	3.1%	0.4%	-2.0%	**4.6%**
	Increase in current level of cover (e.g. 1.5x implies additional cover required equal to 1.5 times current level)	9.4	3.0	0.9	0.1	-0.6	**1.7**
Reduce household expenditure	Required reduction in household expenditure	52%	52%	27%	3%	-15%	**32%**
Additional income required	Extra income required per month (net of tax)	7 682	7 643	4 836	569	-3 291	**5 362**
	Extra income as % of *earnings* pre-event	86%	56%	24%	3%	-14%	**35%**

Disability *insurance gap*

For the *disability event*, the figures are as follows:

Table 24 - Responses to the disability insurance gap by age

		Under 30	30-39	40-49	50-54	55 and over	**All**
Purchase additional Insurance	Cost of insurance (as % of current *earnings*)	5.2%	3.6%	2.0%	1.0%	0.2%	**2.6%**
	Increase in current level of cover (e.g. 1.5x implies additional cover required equal to 1.5 times current level)	1.7	1.3	0.9	0.7	0.2	**1.2**
Reduce household expenditure	Required reduction in household expenditure	36%	34%	21%	9%	2%	**24%**
Additional income required	Extra income required per month (net of tax)	7 846	8 105	6 326	2 936	675	**6 475**
	Extra income as % of *earnings* pre-event	88%	59%	32%	15%	3%	**42%**

8 THE *INSURANCE GAP* PER PROVINCE

8.1 Segments

Earners were categorised based on the province they reside in:

Table 25 - Demographics of earners in each of the provinces

Segment	Number of *earners* (million)	Average annual *earnings* (Rand)	Average Age
Western Cape	2.3	231 560	38
Eastern Cape	1.2	139 840	37
KwaZulu-Natal	2.5	137 385	37
Northern Cape	0.3	146 086	36
Free State	0.8	129 343	38
North West	0.9	135 323	39
Gauteng	5.4	227 456	38
Mpumalanga	1.1	156 767	37
Limpopo	1.1	134 475	38
All	**15.6**	**183 649**	**38**

8.2 Findings

The numbers in the remainder of this section reveal that:

- *Cover adequacy* (*actual cover / insurance need*) for the *death event*, ranges quite a lot from 22% (Limpopo) to 46% (Western Cape).
- For the *disability event*, the *cover adequacy* (*actual cover / insurance need*) ranges from 32% (Limpopo) to 53% (Western Cape).

8.3 The size of the *insurance gap* per segment

We show figures for the "average *earner*" within each segment:

Death *insurance gap* per *earner*

Table 26 - Derivation of the per-earner death insurance gap by province

	Western Cape	Eastern Cape	KwaZulu-Natal	Northern Cape	Free State	North West	Gauteng	Mpumalanga	Limpopo
Insurance need	**1 869 343**	**1 295 863**	**1 323 852**	**1 402 056**	**1 072 975**	**1 133 303**	**1 849 216**	**1 517 892**	**1 238 869**
Total income at risk	231 560	139 840	137 385	146 086	129 343	135 323	227 456	156 767	134 475
* Replacement ratio	57%	61%	59%	59%	54%	56%	55%	58%	58%
* Capitalisation factor	14.3	15.3	16.2	16.4	15.2	14.9	14.8	16.7	15.9
Actual cover	**-853 588**	**-442 578**	**-358 555**	**-382 397**	**-298 845**	**-326 095**	**-796 707**	**-351 146**	**-273 192**
Retail insurance	-501 311	-267 862	-244 491	-233 572	-228 771	-224 513	-478 425	-272 778	-235 423
Group insurance	-352 277	-174 716	-114 065	-148 825	-70 073	-101 582	-318 283	-78 368	-37 769
Government grants	0	0	0	0	0	0	0	0	0
Insurance gap	**1 015 755**	**853 285**	**965 296**	**1 019 659**	**774 130**	**807 208**	**1 052 508**	**1 166 746**	**965 677**
Cover adequacy	**46%**	**34%**	**27%**	**27%**	**28%**	**29%**	**43%**	**23%**	**22%**
Number of *earners* (m)	2.3	1.2	2.5	0.3	0.8	0.9	5.4	1.1	1.1
Total *insurance gap* (R'bn)	2 318	1 064	2 365	320	629	697	5 732	1 287	1 032

For example, the average Limpopo *earner* typically needs R1.2m of life cover to ensure the household can maintain its standard of living after her/his death.

Typically, such an *earner* would have life cover of less than R0.3m, implying that only 22% of the life *insurance need* is protected by *actual cover*.

Disability *insurance gap* per *earner*

Table 27 - Derivation of the per-earner disability insurance gap by province

	Western Cape	Eastern Cape	KwaZulu-Natal	Northern Cape	Free State	North West	Gauteng	Mpumalanga	Limpopo
Insurance need	**2 683 926**	**1 850 615**	**1 920 572**	**2 117 832**	**1 686 470**	**1 748 723**	**2 673 711**	**2 216 347**	**1 834 875**
Total income at risk	231 560	139 840	137 385	146 086	129 343	135 323	227 456	156 767	134 475
* Replacement ratio	76%	81%	82%	83%	81%	83%	76%	82%	82%
* Capitalisation factor	15.2	16.3	17.1	17.4	16.0	15.6	15.4	17.3	16.5
Actual cover	**-1 433 130**	**-935 115**	**-810 443**	**-882 045**	**-646 201**	**-709 017**	**-1 313 098**	**-705 072**	**-587 349**
Retail insurance	-406 853	-220 004	-208 319	-213 725	-191 219	-194 993	-392 262	-237 724	-204 488
Group insurance	-822 146	-409 815	-286 420	-388 417	-167 236	-235 954	-719 258	-198 479	-85 489
Government grants	-204 132	-305 297	-315 704	-279 903	-287 747	-278 070	-201 577	-268 869	-297 372
Insurance gap	**1 250 796**	**915 501**	**1 110 129**	**1 235 787**	**1 040 269**	**1 039 705**	**1 360 613**	**1 511 275**	**1 247 526**
Cover adequacy	**53%**	**51%**	**42%**	**42%**	**38%**	**41%**	**49%**	**32%**	**32%**
Number of *earners* (m)	2.3	1.2	2.5	0.3	0.8	0.9	5.4	1.1	1.1
Total *insurance gap* (R'bn)	2 854	1 142	2 720	388	846	898	7 410	1 667	1 333

For example, the average Gauteng *earner* typically needs approximately R2.7m of disability cover to ensure the household can maintain its standard of living after her/his disability. (This is higher than the average *earner* in South Africa due mostly to the superior average *earnings* of *earners* in Gauteng.) Typically, such an *earner* would have disability cover around R1.3m, implying that additional disability cover of almost R1.4m is required for the average Gauteng *earner*.

8.4   Responses to the *insurance gap*

Death *insurance gap*

The table below gives (for each of the segments) the degree of intervention required for each of three possible responses to the *insurance gap* in the case of a *death event*:

Table 28 - Responses to the death insurance gap by province

		Western Cape	Eastern Cape	KwaZulu-Natal	Northern Cape	Free State	North West	Gauteng	Mpumalanga	Limpopo	**All**
Purchase additional Insurance	Cost of insurance (as % of current *earnings*)	3.7%	5.2%	6.0%	6.0%	5.1%	5.2%	3.9%	6.4%	6.2%	**4.6%**
	Increase in current level of cover (e.g. 1.5x implies additional cover required equal to 1.5 times current level)	1.2	1.9	2.7	2.7	2.6	2.5	1.3	3.3	3.5	**1.7**
Reduce household expenditure	Required reduction in household expenditure	27%	37%	40%	40%	37%	39%	28%	43%	45%	**32%**
Additional income required	Extra income required per month (net of tax)	5 497	4 617	5 223	5 518	4 189	4 368	5 695	6 314	5 226	**5 362**
	Extra income as % of *earnings* pre-event	28%	40%	46%	45%	39%	39%	30%	48%	47%	**35%**

Disability *insurance gap*

For the *disability event*, the figures are as follows:

Table 29 - Responses to the disability insurance gap by province

		Western Cape	Eastern Cape	KwaZulu-Natal	Northern Cape	Free State	North West	Gauteng	Mpumalanga	Limpopo	**All**
Purchase additional Insurance	Cost of insurance (as % of current *earnings*)	2.1%	2.5%	3.1%	3.3%	3.1%	3.0%	2.3%	3.7%	3.6%	**2.6%**
	Increase in current level of cover (e.g. 1.5x implies additional cover required equal to 1.5 times current level)	0.9	1.0	1.4	1.4	1.6	1.5	1.0	2.1	2.1	**1.2**
Reduce household expenditure	Required reduction in household expenditure	20%	25%	29%	31%	30%	31%	21%	35%	37%	**24%**
Additional income required	Extra income required per month (net of tax)	6 556	4 798	5 818	6 477	5 452	5 449	7 131	7 921	6 538	**6 475**
	Extra income as % of *earnings* pre-event	34%	41%	51%	53%	51%	48%	38%	61%	58%	**42%**

9 THE *INSURANCE GAP* PER GENDER

9.1 Segments

Earners are split between male and female as following:

Table 30 - Demographics of earners separately for males and females

Segment	Number of *earners* (million)	Average annual *earnings* (Rand)	Average Age
Male	8.8	197 323	38
Female	6.8	165 949	38
All	**15.6**	**183 649**	**38**

9.2 Findings

The numbers in the remainder of this section reveal that:

- The cover adequacy is very similar for both death and disability cover for males and females.
- Males make up roughly 57% of the total insurance gap, and females the remaining 43%.
- The cost of purchasing additional insurance is clearly cheaper for females compared to males.

9.3 The size of the *insurance gap* per segment

Death *insurance gap* per *earner*

Table 31 - Derivation of the per-earner death insurance gap by gender

	Male	Female
Insurance need	**1 616 909**	**1 511 212**
Total income at risk	197 323	165 949
* Replacement ratio	53%	62%
* Capitalisation factor	15.4	14.8
Actual cover	**-624 783**	**-522 058**
Retail insurance	-401 769	-317 214
Group insurance	-223 014	-204 843
Government grants	-	-
Insurance gap	**992 126**	**989 154**
***Cover adequacy* (Cover/Need)**	**39%**	**35%**
Number of *earners* (millions)	8.8	6.8
Total *insurance gap* (R'bn)	8 726	6 721

For example, a male *earner* with would typically need death cover of about R1.6m. Typically such an *earner* would only have cover of R0.6m, leaving an *insurance gap* of R1.0m – implying that only 39% of the life *insurance need* is protected by *actual cover*.

Disability *insurance gap* per *earner*

Table 32 - Derivation of the per-earner disability insurance gap by gender

	Male	Female
Insurance need	**2 350 184**	**2 205 519**
Total income at risk	197 323	165 949
* Replacement ratio	74%	85%
* Capitalisation factor	16.1	15.5
Actual cover	**-1 092 651**	**-998 667**
Retail insurance	-332 940	-263 962
Group insurance	-493 537	-506 031
Government grants	-266 175	-228 674
Insurance gap	**1 257 533**	**1 206 852**
Cover adequacy (Cover/Need)	**46%**	**45%**
Number of *earners* (millions)	8.8	6.8
Total *insurance gap* (R'bn)	11 060	8 200

For example, a female *earner* with would typically need disability cover of about R2.2m. Typically such an *earner* would only have cover of R1.0m, leaving an *insurance gap* of R1.2m – implying that 45% of the disability *insurance need* is protected by *actual cover*.

9.4   Responses to the *insurance gap*

Death *insurance gap*

The table below gives (for each of the segments) the degree of intervention required for each of three possible responses to the *insurance gap* in the case of a *death event*:

Table 33 - Responses to the death insurance gap by gender

		Male	Female	**All**
Purchase additional Insurance	Cost of insurance (as % of current *earnings*)	4.5%	4.8%	**4.6%**
	Increase in current level of cover (e.g. 1.5x implies additional cover required equal to 1.5 times current level)	1.6	1.9	**1.7**
Reduce household expenditure	Required reduction in household expenditure	35%	30%	**32%**
Additional income required	Extra income required per month (net of tax)	5 369	5 353	**5 362**
	Extra income as % of *earnings* pre-event	33%	39%	**35%**

For the *disability event*, the figures are as follows:

Table 34 - Responses to the disability insurance gap by gender

		Male	Female	**All**
Purchase additional Insurance	Cost of insurance (as % of current *earnings*)	2.6%	2.6%	**2.6%**
	Increase in current level of cover (e.g. 1.5x implies additional cover required equal to 1.5 times current level)	1.2	1.2	**1.2**
Reduce household expenditure	Required reduction in household expenditure	26%	22%	**24%**
Additional income required	Extra income required per month (net of tax)	6 591	6 325	**6 475**
	Extra income as % of *earnings* pre-event	40%	46%	**42%**

APPENDIX A: DEFINITIONS

"Actual cover"

The *actual cover* is the total amount of existing insurance cover of various kinds. It includes cover from insurers (retail and group-type cover), self-insurance pension schemes (like the GEPF) and government disability grants.

Cover types designed to provide for shorter term expenses are excluded (consistent with the definition for *insurance need*). Cover disregarded in *actual cover* include:

- Funeral Cover: It was pragmatically assumed that funeral cover provides for short-term expenditure related to the death-event and is therefore not typically earmarked for post-event provision.

- Road Accident Fund: The Road Accident Fund provides cover for expenses incurred (medical and legal) as well as loss of support that are the result of certain types of road accidents. It would not be suitable for an individual will take this into consideration when doing a financial needs analysis.

- Compensation Fund: Workman's compensation cover is of a short-term, immediate nature. Since the definition of *insurance need* excludes such short-term costs, this source of cover was excluded from the study.

- Short-term insurers: Short-term insurers also provide a degree of life and disability cover. Given [a] the fairly modest quantum and [b] the complexities involved in obtaining detailed data from providers this source was pragmatically excluded.

"Cover adequacy"

Cover adequacy is calculated as the *actual cover* as percentage of the *insurance need*. It therefore reflects the extent to which the *insurance need* is covered by *actual cover*. A number of 100% indicates no need for additional insurance.

"Death event"

For purposes of this report, a *death event* is defined as the death of an *active earner*. To determine the death *insurance gap,* we essentially consider the separate death of each of the earners in South Africa (assuming that all other members of the household survive) and then aggregate the result over the 15.6 million people.

"Disability event"

For purposes of this report, a *disability event* is defined as total and permanent disability of an *active earner*, i.e. where it is unlikely for the disabled person to return to work any time after the event.

"Earner"

These are the individuals for which an *insurance gap* was calculated and aggregated to arrive at the total gap for purposes of this study. To be included, an individual had to be [a] South African, [b] earning a regular income (i.e. be an "active earner") and [c] between the ages of 18 and 65.

"Earnings"

Throughout this document reference to *earnings* implies annual payments for ordinary-time, standard or agreed hours for all *active earners* before taxation and other deductions. It includes salaries, wages, commissions, fees and employer's contributions (e.g. to pension, provident, medical aid, sick pay and other funds). The definition includes bonuses (performance or otherwise) and overtime payments.

"Insurance gap"

The *insurance gap* is defined as the difference between the *insurance need* and *actual cover*. It therefore represents the total net additional cover that will be purchased by South African *active earners* in the following situation:

- Those that are under-insured purchase additional cover, so that their *actual cover* equals their *Insurance need*.
- Those that are over-insured reduce their current *actual cover* to reflect their respective *insurance need*. (This includes those that do not have an *insurance need*, but do have a*ctual cover*, terminating their policies.)

"Insurance need"

This is the amount of cover required to meet the need that is created by the *death event* and/or *disability event*. It excludes any short-term expenses related to the risk event. E.g. for the *death*

event, funeral costs were not considered. Neither was additional medical or equipment expenditure that may be required as a result of the *disability event*.

It was assumed that the household maintains its current living standards after the *death event / disability event*. Expenditure post event changes only insofar as this event would lead to a reduction or elimination of certain household expenses from that point forward.

It was assumed that an *insurance need* only exists up to intended *retirement age*. From this point onwards it was assumed that prior retirement provision would fund the household's expenditure. This study therefore ignores the extent to which insufficient allowance may currently be made by *earners* for post-retirement expenses.

"Retirement age"

Retirement age was taken to be between 60 and 65, depending on the *earner's* current age: For those younger than 58, it was assumed that retirement would take place at age 60. *Earners* older than 63 were assumed to have intended *retirement age* of 65. The assumption for the intended *retirement age* of *earners* aged between 58 and 63 was phased in between 60 and 65.

APPENDIX B: MODELLING NOTES - *EARNER* POPULATION

Where assumptions were required, we generally aimed to set these at objective "best estimate" levels. However, where this proved difficult, our approach was to rather err in the direction that would provide a lower *insurance gap*.

The base source of information in terms of the composition of the South African *earner* population was the metadata from StatsSA's Living Conditions Survey 2014/2015. The 15.6m earners are represented by about almost 21,000 model points with suitable weights to ensure objectively weighted representation.

Information was updated using a combination of the following sources:

- The latest General Household survey published by StatsSA
- Quarterly Labour Force Surveys published by StatsSA
- Quarterly Employment Statistics
- Consumer Price indices

For each of the model points representing a number of South African *earners*, the *insurance gap* was determined as the difference between the *insurance need* and *actual cover (*see modelling notes in Appendix C and Appendix D*)*.

APPENDIX C: MODELLING NOTES - *INSURANCE NEED*

The modelling of the *insurance need* is best explained by considering its breakdown into three components:

Table 35 - Insurance need represented as product of three numbers

	More information	Total (R'billion)		Average per earner (Rand)	
		Death	Disability	Death	Disability
Total income at risk	Appendix C1	2 863	2 863	183 649	183 649
* Replacement ratio	Appendix C2	57%	78%	57%	78%
* Capitalisation factor	Appendix C3	15.1	15.9	15.1	15.9
Total		24 488	35 654	1 570 843	2 287 134

Appendix C1: Total Income at Risk

Definition

Total income at risk allowing for all income as per the definition (Appendix A) of *earnings*.

Growth in workforce since previous study = 3.7% pa

The Living Conditions Survey 2014/2015 reported 14.8m *earners*. To derive the number of *earners* at the end of 2018, we allowed for growth of 5.4% (in total, not pa) as per the Quarterly Employment Statistics issued by StatsSA. Total number of earners end 2018 (15.6m) has grown by 3.7% per annum from the previous study.

Growth in average *earnings* since previous study = 7.3% pa

This study assumes that the average level of *earnings* increased by 7.3% pa since the previous study. The main data source for arriving at this parameter was the Quarterly Employment Statistics issued by Statistics South Africa.

Total level of *earnings* modelled

Combining the growth in *earners* (3.7% pa) and the growth in *earnings* (7.3% pa) results in a modelled increase in total *earnings* of 11.2% pa:

Table 36 - Total earnings by earners increased by 11.2% pa

	2016 study	2019 study	Increase per annum
Number of *earners* (million)	14.00	15.59	3.7%
Average annual *earnings* (Rand)	148 555	183 649	7.3%
Total annual *earnings* (R'm)	2 079 363	2 862 903	11.2%

The 11.2% increase pa in total *earnings* modelled compares favourably with the increase derived from StatsSA's quarterly Employment Statistics publications where the increase over the same three-year period was reported as 8.4% pa.

Total earnings modelled amounts to R2 863bn. Total earnings according to the Quarterly Employment Statistics (QES) publications amount to R2 728bn. However, it needs to be borne in mind that the QES publication includes only the 10.15m *earners* in the formally employed (and therefore likely higher paid) sector. There are also differences in the definition of earnings. For example, the QES earnings numbers include severance, termination and redundancy payments.

Appendix C2: Replacement Ratio

The replacement ratio represents the proportion of the household *earner* member's personal income that "will be missed" after the *death event* or the *disability event*. It is calculated as the "household budget deficit post-event" divided by personal income at risk. The "household budget deficit post-event" is calculated (for each of the model points) as the difference between:

- Household expenses post-event (an annual figure): This takes into account the fact that, in a *death event*, expenses directly related to the *earner* considered will disappear from the household expense budget.
- Household income post-event (an annual figure): This takes into account income that will continue after the *death event / disability event* mostly from other *earners* and retired household members.

Insurance proceeds are not taxed (the taxation on both life and disability insurance products is now mostly based on "tax-free benefits through post-tax premiums"). The portion of personal income that was directed towards income tax is therefore excluded when the *insurance need* is calculated.

For the death *insurance need*, the replacement ratio additionally takes the following into account:

- Insurance cover for single-member families is only required to the extent that support payments to other households formed part of income.
- When an *earner* dies, the household expenditure will be lower post-event. For modelling purposes, we allocated total household expenses into different categories:

- o Fixed expenses: Expenses that cannot sensibly be assigned / allocated to any specific member in the household and would therefore not change materially much should the family become smaller. Examples include expenditure on housing, washing and cleaning expenditure and domestic worker wages.

- o Adult expenses: Post-event expenditure is adjusted by taking into account the number of adults in the household before and after the event. Examples include alcoholic beverages.

- o People expenses: Post-event expenditure is adjusted by taking into account the number of people in the household before and after the event. Examples include food, clothing, reading matter and stationary.

- To the extent that savings represent provision for retirement, it needs to remain in the expense base as we are relying on these contributions to provide the household with an income from the intended retirement age. To the extent that it represents wealth creation though, it should be excluded from the expense base in line with definitions of insurance need (maintenance of current standard of living).

For the disability *insurance need*, the replacement ratio also takes into account the savings-element with wealth creation motive that will not be required in the post-event situation.

Appendix C3: Capitalisation Multiple

A capitalisation factor is calculated by determining the number of years that the *earner* would still have contributed to the household up to *retirement age* only.

Generally speaking, the term is the period that household members would have remained dependent on income at risk. As current retirement provision expenditure was retained in the expense base, it is appropriate to allow the dependency duration to cease at what would have been the retirement date.

In determining these factors, an interest rate that exceeds living expense inflation by 1.5% was assumed.

APPENDIX D: MODELLING NOTES - *ACTUAL COVER*

Accurate calculation of the *insurance need* for each of the sample / model points on the representative dataset (populated metadata from Statistics South Africa) is possible as all information affecting it is available at this level. This, however, is not the case for *actual cover*. The StatsSA datasets do not contain any information on product ownership or insurance cover. Hence, additional resources had to be used to [1] determine the total level of *actual cover* as at end 2018 and [2] assign this cover to each of the sample points in the dataset.

Appendix D1: ASISA questionnaires

The long-term insurance industry is the primary source of life and disability cover. A questionnaire was sent to all relevant insurers who were requested to provide

- Information on total cover amounts in the format that this information is reported annually to the regulator (the so-called TP2.1 and TP2.2 statements). These statements contain information on the total payments (separately for Retail and Group cover and per cover type) that would be made in the hypothetical scenario where all their policyholders were subject to a separate and independent *death event* and *disability event*.
- Additional information that would allow adjustments to these figures for purposes of determining the *actual cover* for this study. This includes information that would allow approximate allocation of total cover amounts between different age groups, genders and socio-economic groups.

Most information was of high quality. Where material inconsistencies were identified these were discussed with the insurers which then often resulted in adjustments being made / new information being supplied.

The following adjustments were made to the insurer-provided data:

- Capitalising disability income cover: Income disability cover was capitalised by discounting regular payments. Payments were multiplied by annuity factors allowing for the term to retirement (dependant on current age) as well as whether payments would escalate or not and at which rate (supplied by most insurers).
- Translating socio-economic groups to income groups: For retail cover, insurers were requested to provide information split per socio-economic group as per their own definition / categorisation.

- Allowing for non-respondents: The response factor was quite high with all the major insurers (by market share) providing information. Approximate allowance was made for the (around 12% of market share) non-respondents.

- Excluding out-of-scope cover: As the study is concerned with the *actual cover* of *active earners* only, we had to (approximately) exclude such (retail) cover held by retired and unemployed individuals.

Appendix D2: Other data sources

Self-insured pension schemes provide a material proportion of total group risk cover. Allowance was made for such cover based on discussions with advisors to these schemes as well as publicly available information.

Government is a major source of disability cover through its disability income grant and the study paid due consideration to the conditions for payment of these grants. Current qualification criteria and levels were allowed for.

Appendix D3: Allocation of *actual cover* to each modelled *earner* - True South models

This total level of *actual cover* (derived from the above sources) then had to be allocated to each of the "model points" representing the South African *earner* population. This was done separately for individual life cover, individual disability cover, group life cover and group disability cover using two True-South developed models which were calibrated using the data sources described above:

- TSPO-model: The True South Product Ownership model returns the probability of a South African *earner* having life or disability cover based on supplied information such as education, age, income, marital status, family composition and geography (per province).

- TSCL-model: The True South Cover Level models return the level of cover given that cover does exist based on similar information required by the TSPO-model.

Genetic algorithm technology[4] was used to solve the optimisation problem of fitting the model parameters. As mentioned elsewhere, input for deriving the parameters were obtained from a wide variety of sources.

The total *actual cover* for each of the sample points was derived by multiplication of the probability of being insured (from the TSPO-model) with the average level of cover (from the TSCL-model) for each of the four cover types (life vs. disability and retail vs. group).

Some interesting findings derived from the TSPO model are provided below:

- **Level of education**

There is a very strong correlation between insurance policy ownership and highest level of education attained. The likelihood of a graduate having an insurance policy is 3.6 times higher than an otherwise identical person (with regard to income, age, gender, family composition, marital status), but with only a primary school education.

The following table shows the proportion of earners that has a retail life and disability insurance policy per level of highest education:

Table 37 - Retail policy ownership of earners in each of the education segments

Segment	Number of *earners* *(million)*	Life policy ownership %	Disab policy ownership %
PS or lower	1.7	5%	2%
Some HS	5.7	10%	4%
Matric	5.5	23%	11%
Diploma	0.9	51%	29%
Degree	1.8	75%	38%
All	15.6	24%	12%

The table shows that earners in different segments are typically not "identical" (with regard to income, age, gender, family composition, marital status), as the true likelihood of a graduate having an insurance policy is 14.9 and 21.3 times higher for life and disability respectively than for a person with only a primary school education.

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[4] A genetic algorithm is an experience-based technique for problem solving that mimics the process of natural evolution (i.e. using concepts inspired by natural evolution, such as inheritance, mutation, selection, and crossover). This approach is routinely used to generate useful solutions to optimization and search problems, including previously unsolvable, complex non-linear problems.

- **Age**:

A 50-year-old person is 3.6 times more likely to own a life insurance policy (4.8 times for a disability insurance policy) compared to an otherwise identical person aged 20. The following table shows the proportion of earners that has a retail life and disability insurance policy age group:

Table 38 - Retail policy ownership of earners in each of the age segments

Segment	Number of *earners* *(million)*	Life policy ownership %	Disab policy ownership %
Under 30	4.3	9%	6%
30-39	4.7	22%	13%
40-49	3.8	36%	17%
50-54	1.4	32%	14%
55 and over	1.4	38%	10%
All	15.6	24%	12%

- **Income**:

A person with *earnings* in the top quartile is about 1.6 times more likely to have life insurance compared to an otherwise identical person (including education level, age etc.), but with *earnings* in the next (second) quartile. For disability policy ownership this distinction is much more pronounced with the factor being 2.0.

The following table shows the proportion of earners that has a retail life and disability insurance policy per income level:

Table 39 - Retail policy ownership of earners in each of the income segments

Segment	Number of *earners* *(million)*	Life policy ownership %	Disab policy ownership %
Poorest 20%	3.1	1%	0%
2nd Quantile	3.1	4%	1%
3rd Quantile	3.1	14%	6%
4th Quantile	3.1	32%	15%
Richest 20%	3.1	69%	36%
All	**15.6**	24%	12%

- **Province**: The above factors adequately explain the extent of likely insurance cover, except for group insurance where there is a much-enhanced probability of group life cover and / or disability cover if an *earner* resides in Gauteng or the Western Cape.
- **Group cover**: The main determinants for the level of group cover are salaries and wages, age and education level.