

Actuarial Society of South Africa

EXAMINATION

May 2016

Subject A302 — Communications

EXAMINERS' REPORT

This subject report has been written with the aim of helping candidates. This report summarises the main points that the examiners were looking for and some common problems encountered.

Candidates were asked to draft the following:

- *A presentation*
- *An email to their mother;*

General Comments

QUESTION 1 - Presentation

The students were expected to conclude and communicate that statistics are only useful if they are meaningful to the situation that they are being used for. In this case the statistic wasn't useful.

Students struggled with the concept of life expectancy – both what it means as well as some basic calculations to illustrate its use. Given this is a fundamental concept for actuaries the examiners found this to be quite disappointing. Many students did battle with the calculations specific to life expectancy and it seemed to throw candidates off being able to complete the question. However, the calculations only accounted for 4 marks, with many bonus marks available for them to make up what they may have lost out on for not being able to recall or derive a formula. No student would have failed for simply leaving the calculations out. Some students did in fact pass the exam without completing the calculations correctly (and simply noted they had just made up the figures as a footnote).

Common mistakes were:

- Candidates don't use all the information provided to them in the question. The examiners try to only give information that is relevant to answering the question. Candidates should check to see they have used all the information given.
- Simple application of probabilities to a practical situation was very weak.

Many students only presented back the information given in the question and failed to draw insights from the information. Those students with some general knowledge of South African mortality and HIV and AIDS fared better.

QUESTION 2 – Email

The question placed the student in a potential conflicted situation and expected the student to present a balanced view while still providing a firm conclusion and recommendation. Although the intention in the question was that the recommendation should be not take the whole policy, the question wording on this was vague which lead many students to recommend taking the policy, but not the cash back offer. If the calculations were done correctly this was not a logical conclusion, however students were not penalised for this.

Common mistakes

- A surprising number of candidates made basic errors in compound interest calculations. No student at this point in the exams should be making these errors.
- Although the question provided guidance on the steps to follow to get to the conclusion, students didn't provide answers for all the steps.
- Almost no students were able to provide any insight into how the cash back offer provided such apparent high value.
- Students miss easy marks because they don't use reuse information to deal with specific aspects. For example, a feature of the product may also be a risk.

Possible solutions are attached. They do not cover all the possible points, and are not intended to be model solutions. In practice a wide range of solutions was acceptable.

Life expectancy is not what you expect

What does life expectancy mean for members of the XYZ Provident Fund?

Alex Jonas
Fund actuary

13 May 2016

Overview

- What is life expectancy?
- Why has life expectancy changed?
- What could you expect of life expectancy?
- How does life expectancy differ by person?
- How does life expectancy affect XYZ Provident Fund members?
- Conclusion

2

What is life expectancy?

- It's the average number of years that people can expect to live from the day they are born.
- Some will live longer.
- Some will die earlier.
- It can be measured at any age, not just at birth.
- It applies to all people living in South Africa.
- Statistics South Africa collects the data.

3

Why has life expectancy changed?

- Up to 2005
 - Life expectancy at birth reduced to 52
 - This reduction was mainly due to:
 - Increasing number of people with HIV
 - Poor medical treatment
 - Increase in deaths
 - Shorter life expectancy

4

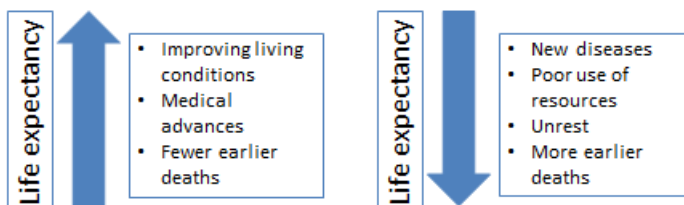
Why has life expectancy changed?

- From 2005 to 2014
 - Life expectancy at birth increased to 59.1 for men and 63.1 for women
 - This increase was mainly due to:
 - Better medication for HIV positive people
 - Medication cheaper and easier to take
 - Increasing number of people with HIV BUT fewer deaths
 - Increasing life expectancy for all South Africans

5

What could you expect of life expectancy?

Future is uncertain



6

How does life expectancy differ by person?

Age	Males		Females	
	Life Expectancy	Expected Age at Death	Life Expectancy	Expected Age at Death
0	59.1	59.1	63.1	63.1
30	35.0	65.0	40.7	70.7
50	19.3	69.3	23.8	73.8
65	9.7	74.7	12.7	77.7

The table shows the number of years of life expectancy and the expected age at death for each age and gender.

For example:

- A 30 year female is expected on average to live for 40.7 years which means that they would be 70.7 when they die.

The longer a person lives, the older they are expected to be when they die.

7

How does life expectancy affect XYZ Provident Fund members

Current Age	Males	Females	TOTAL
30	57%	72%	67%
50	68%	80%	77%
TOTAL	61%	75%	71%

The table shows the proportion of members that are expected to reach age 65.

For example:

- 80% of 50 year old females are expected to live to 65.

71% of *all* our members are expected to live to retirement.

8

Conclusion

- Life expectancy
 - is an average
 - changes over time
 - not specific to any individual
- Life expectancy at birth is therefore not a useful statistic for fund members.
- 71% of members are expected to reach retirement increasing to 77% for females.

9

Thank you

Any Questions?

Contact Alex Jonas if you have any
further queries.

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May 2016 - Sample Answer - Question #2

From: alexa@bestlife.co.za
To: actuarymom@mymail.com
Subject: Good deal from BestLife

Sent: 13 May 2016 10:45am

Hi Mom

We have received lots of interest in our cash-back benefit and I will cover the important information that you need to know in this email.

If you were to buy this policy, then you would qualify for a R700 000 death benefit at a premium of R550 per month. The cash-back premium would be an additional R165 per month which means a total monthly premium of R715 per month. You would pay this fixed premium each month for 15 years. The total premiums paid for the cash-back benefit is therefore R29 700 and for the whole policy is R128 700.

After 15 years you would receive the cash-back benefit payment of R128 700. This amount is only paid if

- the death benefit hasn't been paid,
- the policy hasn't been cancelled and
- all the premiums have been paid.

If you were to take the cash-back premium of R165 per month and invest this in a suitable investment that earns 1% per month for 15 years, you would accumulate R83 255.04. The cash-back benefit therefore offers better value with a payout of R128 700.

You thought this was too good to be true, but it is correct. The reason that we can offer this very good value on this benefit is because of the conditions we have for payment of the cash-back benefit. The policyholder must be alive and the policy must be paid for in full and not have been cancelled. The cash-back premiums that have been paid by policyholders that died or stopped their policies before the 15 years were up are being used to enhance the benefit of those that keep their policy for the full 15 years. We are rewarding policyholders who keep to their premium commitments. If the policyholder had died they would have been paid the much larger death benefit payout instead.

While this sounds great the cash-back benefit is not without risks that you need to know about. If you decide that you don't want the policy anymore before 15 years are up, you don't get anything back. The company might decide that the premium you are paying is not enough and it could increase the premium to an amount that you are not happy to pay. Bestlife could get into financial difficulty and not be able to pay the benefits as promised, but this risk is very small in our well regulated market.

That being said I don't recommend that you take this policy for these reasons:

- You don't need the life cover and this situation is unlikely to change and if you did we should look at other quotes first.
- You could invest the whole R715 per month and get R360 771.84 after 15 years based on current expected returns which is more than the R128 700 cash-back benefit.
- With an investment the money invested is always yours, and depending on the investment, you could withdraw it if necessary.

If there is more that you would like to know we can talk on Sunday when I see you.

Love Alex

(505 words)