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Updated remarriage contingency deductions for widowed South Africans

by A Channa, J Yuan & MBJ Carswell

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ABSTRACT

Where a widowed person has a legal claim for support following the death of their spouse, their compensation may be reduced to allow for the possibility of remarriage. This reduction, known as a remarriage contingency, accounts for both the probability of remarriage and the change in financial status on remarriage. The only South African tables available are viewed as outdated and focus only on widows. This research uses data from the National Income Dynamics Survey to find updated remarriage contingencies for South African widows and widowers. The data indicate that age and race may influence the remarriage probabilities although this result may have been influenced by poor income and child data. The remarriage contingencies calculated were lower than the old tables for widowed whites and younger coloureds but higher for widowed Africans, Asians and older coloureds. The remarriage contingencies calculated were high relative to the general post-settlement contingency of 15% suggesting that there may still be scope for an explicit remarriage contingency.

KEY WORDS

Remarriage; contingency deductions; remarriage rates; widowers; widows

CONTACT DETAILS

Mrs Megan Carswell, School of Statistics & Actuarial Science, University of the Witwatersrand, Johannesburg; E-mail: Megan.Carswell@wits.ac.za

1. INTRODUCTION

1.1 Background

1.1.1 A widow may have the legal right to claim for support from the deceased spouse (Thomson, 1988). Such legal claims include claims made against the Road Accident Fund (RAF) and claims made in respect of the Maintenance of Surviving Spouses Act.[1] Once the quantum of the loss is established, a deduction may be applied to the amount she will receive due to the possibility that she might remarry (Van der Nest & Nienaber, 2001; Steynberg, 2011). This is because a woman should not be receiving support from two spouses, as any legal claim should be for compensation instead of the enhancement of the widow's financial prospects (Van der Nest & Nienaber, 2001).

1.1.2 Although men may also make legal claims based on loss of support from their spouses, the widower's prospect for remarriage is very rarely considered when calculating his net claim (Van der Nest & Nienaber, 2001).

1.2 Importance of the research

1.2.1 The only published South African table of remarriage contingency deductions was published by Thomson (1988) and were for white, coloured and Asian/Indian widows as data for African widows were not available at the time. A more detailed set of tables is set out in Thomson (unpublished) although Thomson (1988) forms the basis of the remarriage contingency deduction used in actuarial practice.

1.2.2 In 2014 in the case of *LD* v *RAF*,[2] the learned judge made the following remarks:

> Proper statistics relating to remarriage may well be useful in assessing an appropriate contingency, but statistics are only assistive if they are derived from a sufficiently large and representative sample. Furthermore, the statistics should at least be derived from data collected within a reasonable frame of time relative to when the contingency is to be applied so as to provide some validity to the specific social and other circumstances which would influence marriage and remarriage trends prevailing at the time.

In the judgment, the data underlying the Thomson (1988) tables, which were collected between 1970 and 1980, were deemed outdated and unrepresentative. Ultimately, in this case, the remarriage contingency was assumed to be reflected in the general contingencies applied to the claim due to the absence of such 'proper statistics'.

1.2.3 While this judgement is not binding on other jurisdictions, it does cast doubt on the continued use of the Thomson (1988) tables or the blanket general contingency of 15% which according to anecdotal evidence are used in the absence of any other statistics.

1.2.4 Much has changed in South Africa's marriage framework since 1988. Both the Customary Marriages Act[3] which provided formal recognition to customary unions and

1 Act 27 of 1990, as amended. Republic of South Africa.
2 *LD* v *Road Accident Fund* (14606/2016) [2018] ZAGPPHC 181, at paragraph 32
3 Act 120 of 1998 as amended, Republic of South Africa

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the Civil Union Act[4] which allowed for same-sex marriage have been introduced. Hence the definition of marriage used currently is different to that used prior to the publication of the Thomson (1988) tables. Remarriage rates that are more relevant to the current time and definitions of marriage are required for use in finding the remarriage contingency deductions in the case of the claim for loss of support for the widowed.

1.2.5 These newer tables would need to address gender inequality by considering contingencies for widowers (Van der Nest & Nienaber, 2001). They also need to consider the issue of race. Commentators like Van der Nest & Nienaber (2001) and the courts[5] are concerned that race-based tables may be discriminatory.

1.3 Aims

1.3.1 The main aim of this research is to update the probability of remarriage. It is intended that the updated probabilities will be used to determine fairer and more relevant remarriage contingency deductions.

1.3.2 The following questions are considered:

— What are the factors that affect the probability of remarriage and change in financial circumstances on remarriage?
— What are the updated contingency deductions for South Africa?

1.4 Terminology

1.4.1 The term 'widowed' is used to describe both widows and widowers throughout this research.

1.4.2 The term 'black' is used to describe a race group in the context of international literature. The exact definition of this term may differ from country to country. For the purposes of describing the racial characteristics of South Africans, the authors have used the official race groups: African, white, coloured and Asian/Indian. For brevity, the white, coloured and Asian/Indian populations, which collectively make up less than 20% of the population,[6] are referred to as non-African.

1.5 Plan of development

1.5.1 As Steynberg (2007) noted, the contingency deduction incorporates two probabilities among others: firstly, the probability of remarriage and secondly, the probability of financial benefit if such a marriage takes place. The other probabilities relate to survival. Section 2 contains a discussion of the literature on factors known to affect the probability of remarriage and change in financial status on remarriage. This is important as, in developing the new tables, data will need to be divided according to factors that are statistically significant in influencing these probabilities.

4 Act 17 of 2006 as amended, Republic of South Africa
5 For example, *LD* v *Road Accident Fund* (14606/2016) [2018] ZAGPPHC 181
6 STATSSA, Mid-Year Population Estimate, July 2020

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1.5.2 Section 3 describes the dataset and variables. Section 4 gives a broad overview of the three-stage process used to calculate the remarriage contingencies. The methodology that can be used to identify factors that are statistically significant in terms of determining the contingencies is set out in section 5 and the results of this analysis are given in section 6. Section 7 outlines the methodology to calculate the probability of remarriage and the results and discussion are given in section 8. Section 9 outlines the methodology to calculate the contingency deduction and the discussion thereon is set out in section 10. Section 11 summarises and concludes.

2. OBJECTIVELY OBSERVABLE FACTORS AFFECTING THE REMARRIAGE CONTINGENCY

Before tabulated remarriage contingency rates were available, the courts used arbitrary or stereotypical criteria like attractiveness in determining the remarriage contingency (Van der Nest & Nienaber, 2001). The authors submit that contingency deduction tables based on objective and observable characteristics are more defensible even though some unobservable and subjective factors like the level of emotional support received (Carr, 2004) and health status (Smith et al., 1991; Coleman et al., 2000) affect remarriage rates. Health and emotional support are not considered further. The objective criteria that are discussed are sex, age, duration of widowhood, children, education, income and race.

2.1 Factors that affect the probability of remarriage

2.1.1 Sex

Men have a higher probability of remarriage than women (Wu et al., 2015). Carr (2004) hypothesised that this was due to men getting more health and lifestyle benefits from remarriage than women. Gentry & Shulman (1988) found similarly with regard to health benefits. In addition, the income of women falls sharply following widowhood whereas the income of men remains relatively level following widowhood (Ozawa & Yoon, 2002). This relative financial dependence of widows may account for some of the difference in remarriage rates between men and women.

2.1.2 Age at widowhood and current age

2.1.2.1 Wu et al. (2015) analysed Canadian data on cohabitation and remarriage and demonstrated that the age at widowhood has a negative relationship to the remarriage rates of both males and females but to a larger extent for females.

2.1.2.2 Davidson (2002) found that getting older decreases the remarriage probability for both males and females, although this decrease happens much sooner for females. Some reasons for the decline in remarriage probability with age are:

— fewer available partners (Bumpass et al., 1990) particularly healthy ones (Vespa, 2013);
— fewer economic incentives (Wu et al., 2015);
— fewer social benefits (Wu et al., 2015) particularly given the psychological profile of the older widow (Gentry & Shulman, 1988; Vespa, 2013); and
— more practical constraints (Vespa, 2013).

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2.1.2.3 Possible reasons why this effect is less pronounced in men include:

— Men tend to marry younger women than themselves (Moorman et al., 2006).
— At these higher ages, the ratio of women to men will increase, this means that at higher ages men would have more chances to date other women and potentially remarry if they want to (Carr, 2004).
— There is a higher likelihood of males to marry someone from a lower age group (Wu et al., 2015).
— Gender roles can create differences in the desire to remarry at older ages (Wu et al., 2015). Remarriage may be undesirable for older women who do not want the burden of traditional gender roles and the responsibility of being a caregiver. Carr (2004) noted that women may prefer dating to remarriage as they would receive the companionship that they value without the obligations and responsibilities that come with remarriage.

2.1.3 Duration of widowhood

The remarriage rates for widows increase after allowing a certain period of mourning (Smith et al., 1991). Men spend less time in widowhood compared to women (Ahn, 2005) but it is unclear whether there is a difference in this mourning period. After this initial increase in remarriage rates, they decline again due to advancing age as discussed in section 2.1.2.

2.1.4 Number and age of children

2.1.4.1 Having children is considered to be an obstacle to remarriage for women (Bumpass et al., 1990). Empirical evidence by Ivanova et al. (2013) showed that across Europe, widows with children are less likely to remarry than widows without. This may be due to several reasons which are outlined below:

— The dependent children are usually considered to be an extra financial cost to the new family that will be formed (Bumpass et al., 1990).
— The extra children may add complexity to the new family relationships (Gentry & Shulman 1988; Bumpass et al., 1990; Smith et al., 1991; Ivanova et al., 2013).
— Having a younger child who is in need of more attentive care will reduce the time that the widow spends on social activities and at work and thus reduce the opportunity for the widow to meet someone new and consequently remarry (Ivanova et al., 2013).

2.1.4.2 An alternative argument presented by Bumpass et al. (1990) suggested that more children may mean that the widow is likely more pressured financially, which can encourage the widow to more actively search for a new partner and consequently remarry. Ivanova et al. (2013) suggested that this would especially be the case with young children living at home, which would limit work opportunities.

2.1.4.3 However, these factors affect men and women differently. Bishop & Cain (2003) and Ivanova et al. (2013) find no evidence that the number and age of children has a significant effect on a man's propensity to remarry.

2.1.5 EDUCATION

2.1.5.1 Bumpass et al. (1990) noted that there were only very weak data to support the theory that more education results in lower remarriage rates for women. Smith et al. (1991) however did establish this relationship with a p-value of 10%.

2.1.5.2 Smith et al. (1991) also found that for widowers over the age of 60 there is a significant positive relationship between the level of education and the probability of remarriage. There is no such relationship for widowers under the age of 60 (Smith et al., 1991).

2.1.6 INCOME

2.1.6.1 The economic-needs theory suggests that the lower the income of the widowed spouse, the more likely they are to seek remarriage (Pasteels & Mortelmans, 2017). However, as their financial dependence may reduce their remarriage probability, Pasteels & Mortelmans (2017) suggest that income has no net effect on remarriage probability.

2.1.6.2 Pasteels & Mortelmans (2017) did note that the characteristics that make men and women attractive for remarriage have become more similar over time. The labour market prospects of a woman as well as her income earning ability are becoming more important and this is especially the case in societies where dual-income families have become a norm (Pasteels & Mortelmans, 2017). This could explain why some older studies such as Talbott (1998), Dewilde & Uunk (2008) and Vespa (2013) found an inverse relationship between income and a woman's propensity to remarry.

2.1.6.3 However, Wu et al. (2015) found that higher incomes are associated with higher remarriage rates for men. This effect of income may weaken as the age of the widowed increases, since the couples would be less directly dependent on the income of the husband as they age (Carr, 2004).

2.1.7 RACE

2.1.7.1 Older research suggested that white widows remarry more than black widows (Cleveland & Gianturco, 1976; Bumpass et al., 1990; Bramlett & Mosher, 2002). Research done by Bramlett & Mosher (2002) showed that the remarriage rates were diverging by race at that time. It is acknowledged that this older research may no longer be relevant in the South African context.

2.1.7.2 In contrast, research by Laloo (unpublished) showed that for widows aged under 55, race is not a significant factor, and further found that for older widows, African widows have the highest remarriage rate, which differs from international experience.

2.1.7.3 There is a lack of research as to whether race influences remarriage rates for widowers.

2.2 Factors that affect the financial circumstances on widowhood and remarriage

Traditionally, just the income level has been considered when investigating the financial circumstances before and after remarriage, for example in Aslaksen et al. (2005) and Dewilde & Uunk (2008). Ozawa & Yoon (2002) suggested that the change in income status of the remarried widowed should be measured using the income-to-needs ratio to account for

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different family sizes. The income-to-needs ratio is the ratio of the income of a family to the poverty line of the country for a family of a particular size (Ozawa & Yoon, 2002).

2.2.1 Financial circumstances on widowhood

For both men and women, income status declines on widowhood but this depends on household earning patterns and sex (Ozawa & Yoon, 2002; Ahn, 2005). Where the widowed was heavily financially dependent on their deceased spouse, this effect is greater (Ahn, 2005). The income of women falls sharply following widowhood whereas the income of men remains relatively level following widowhood (Ozawa & Yoon, 2002). This could be as a result of men having a stronger attachment to the labour market (Dewilde & Uunk, 2008) or women being more financially dependent (Ahn, 2005).

2.2.2 Financial circumstances on remarriage

Upon remarriage, the financial status can improve or decline relative to the widowed state (Ozawa & Yoon, 2002). This is strongly influenced by sex and income.

2.2.2.1 Sex

Sex influences the income pattern on remarriage strongly. Ozawa & Yoon (2002) found that the income-to-needs ratios for men and women rose by 20.5% and 91.9% respectively on remarriage irrespective of whether the person was previously widowed or divorced. The general pattern is that the financial status improves although men are more likely than women to have a negative change in financial position on remarriage (Ozawa & Yoon, 2002). However, when women do have a negative change in their financial circumstances due to remarriage it is usually to a far greater extent than a man undergoing such a change (Ozawa & Yoon, 2002).

2.2.2.2 Income

Ozawa & Yoon (2002) also found that widowed spouses with higher income experience a much higher boost in the income-to-needs ratio than lower-income individuals. This result holds for both males and females. Dewilde & Uunk (2008) found a similar effect for the income levels of divorced women.

2.2.3 Net pattern

Where financial status improves on remarriage relative to widowhood, this may be a result of higher-income individuals marrying each other (Aslaksen et al., 2005; Dewilde & Uunk, 2008). Aslaksen et al. (2005) noted that this effect becomes more apparent as the level of access to education, labour supply and income for women increases. This supports the assumption in Steynberg (2007) that generally the widowed spouse would marry someone in a similar social group so the financial position of the widowed spouse would be similar before widowhood and after remarriage. However, this general result may not hold for extremely high and low incomes for the deceased spouse (Steynberg, 2007) or for women with low levels of education, low income or who are not in the labour market (Aslaksen et al., 2005).

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3. DATA

3.1 Description

3.1.1 The National Income Dynamics Study (NIDS) dataset was used for this research. This South African study was conducted by the Southern Africa Labour and Development Research Unit at the University of Cape Town School of Economics.[7]

3.1.2 The NIDS study has followed the same group of 28 000 people and their cohabitants since 2008. This sample was selected to be representative of the South African population. Fieldworkers attempt to interview the same people every two years to see if their circumstances have changed since the last interview. Everyone included in the data can be tracked through the different waves through the unique identifier assigned to them. Households are also assigned a unique identifier and so the data are anonymised. Five waves of NIDS were available as of March 2020. Waves one to five of NIDS were based on data collected in 2008, 2010 to 2011, 2012, 2014 to 2015 and 2017 respectively.[8]

3.1.3 This dataset was selected as it is both recent and representative. Given that a focus of the NIDS is to see how households react to shocks including death in the family, it included many of the required data fields, which were outlined in Section 2.

3.1.4 To obtain the data, a request which includes information regarding the name, institution of the researchers, as well the purpose and method of the research was submitted to the NIDS website (nids.uct.ac.za).

3.2 Data cleaning

3.2.1 Data with entries that were not possible were eliminated. For example, when someone selected 'Widow/Widower' in marital status in the first wave but selected 'Never married' in the second wave.

3.2.2 Entries with empty cells in any of the variables in consideration were eliminated to ensure consistency. Any entry with categories where the applicant answered 'Refused' or 'Don't know' was also excluded.

3.2.3 Any newly widowed survey participants arising from wave 1 to wave 4 were also considered. Those identifying as widowed for the first time in wave 5 were not considered as they had no opportunity to remarry.

3.3 Variable definitions

3.3.1 The variable of interest was remarriage on widowhood. A widowed person was only considered remarried if there was a transition from the state of being a 'Widow/Widower' to being 'Married' during the course of the NIDS data periods.

3.3.2 The following variables were directly observable from the data and were of reasonable quality:

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7 Brophy, T, Branson, N, Daniels, R, Leibbrandt, M, Mlatsheni C & Woolard, I, National Income Dynamics Study Panel User Manual (2018), Version 1. Available: http://www.nids.uct.ac.za/images/documents/20180831-NIDS-W5PanelUserManual-V1.0.pdf, 22/09/2020

8 Ibid.

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— Sex (discussed in sections 2.1.1 and 2.2);
— Current age (discussed in section 2.1.2);
— Duration since widowhood (discussed in section 2.1.3), measured in years; and
— Race (discussed in section 2.1.7).

3.3.3 It is acknowledged that when race appears as a variable in research, it may be a proxy for other variables. Recent research has shown that there are still distinct racial differences in South Africa in terms of earnings, transfers and access to assets (UNU-WIDER & Oosthuizen, unpublished). Hence, despite the sensitivity of the topic, the authors believe that analysis by race still adds value. An ethics waiver letter with number HRECNMW20/11/01 was also obtained. Only the main categories for race as specified in the questionnaire for NIDS have been considered. They were African, Coloured, Asian/Indian and White. Applicants who may have been in other race groups have not been considered.

3.3.4 The impact of education level on the remarriage contingency was discussed in sections 2.1.5 and 2.2.3. Education levels used the following variable definitions:
— Limited to no schooling: highest school year obtained smaller than or equal to grade 7; and
— Secondary or higher: any academic qualification equal to grade 8 or higher.

3.4 Data limitations

3.4.1 Waves 4 and 5 of the NIDs data had many incomplete entries regarding the participants' marital status compared with the first three waves. In wave 1, 15 570 data points were available on the marital status of the participants; whereas there were 1 013 and 1 174 in waves 4 and 5 respectively. This means that most of the data that were observed regarding transition from widowhood to remarriage came from the first three waves of data. The effect that this has on the results must be considered when analysing the results

3.4.2 The data would also not have captured remarriage information about someone who was married in one wave and then was widowed and remarried before the next wave. The data would reflect that this person was married the whole time. This may not be a serious limitation in terms of calculating the remarriage contingencies for legal applications as, if a person remarries within two to three years of the spouse's death, the information about the new spouse would be known at the time the matter is considered by the courts. However, it does mean that the remarriage contingencies may understate the probability of remarriage for the very recently widowed.

3.4.3 The relevance of income was discussed in sections 2.1.6, 2.2.2.2 and 2.2.3. There were very limited data on the income of the widowed. In wave 1, only 138 of the widowed provided their income amount. A chi-squared test indicated that this variable did not significantly affect remarriage rates for this dataset when available and hence it was not used in further analysis.

3.4.4 Only women were asked about their children in the NIDS data. This meant that the factors that would affect both women and men could not be evaluated consistently if children were considered. In addition, the information about the children of widows was often inconsistent. For example, the number of children for whom dates of birth were provided did

not match up to the number of children declared. Consequently, information about children could not be used.

3.4.5 As discussed in section 2.2, the change in income from married to widowed to remarried is of great interest when modelling the remarriage contingency. However, there was only one observation for which this data was recorded and so the data could not be used to analyse this.

4. METHODOLOGY OVERVIEW

4.1 The methodology used in this paper unfolds in three distinct stages.

4.2 In the first stage, factors that are statistically significant in affecting the contingency deduction are identified. As discussed in ¶3.4.5, the data were inadequate to consider the extent of financial benefit on remarriage. Hence the only factors that would affect the remarriage contingency deduction would be those that influenced the probability of remarriage. The methodology used for this process is described in section 5. The purpose of this stage was to determine how to divide the data into homogeneous groups while avoiding splitting for factors that are not statistically significant. This provides more credibility in the later stages. The results of the first stage of the analysis are presented in section 6.

4.3 Once these groups had been determined, the second stage of analysis took place which involved calculating the remarriage rates for each homogeneous group, or more accurately, their force of remarriage. This process is discussed in section 7 and depended on the analysis in section 6. The resultant forces of remarriage are presented and discussed in section 8.

4.4 The final step involved using these forces of remarriage to calculate tables of remarriage contingency deductions. The development of the equations used is discussed in section 9 and section 10 contains a discussion of the results.

5. METHODOLOGY TO IDENTIFY STATISTICALLY SIGNIFICANT FACTORS

5.1 Chi-squared automatic interaction detection (CHAID) is a non-parametric method of dividing data into mutually exclusive and exhaustive sets (Kass, 1980). The method, as pioneered in Kass (1980), is described by Ritschard (2013) as follows. A predictor is chosen and the data are divided according to the categories of this predictor. All possible groupings of the predictor with sufficient data to be credible are considered and statistical significance is determined using a chi-square test to get a Bonferroni adjusted p-value. The most statistically significant grouping of the predictor categories is noted. The process is then repeated on another predictor variable until all predictor variables have been considered. The data are then divided by the most statistically significant variable grouping provided the p-value is lower than the cut-off value. If the number of variables in each resultant node are large enough to be credible, the process is then repeated until there are no further statistically significant divisions.

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5.2 This was the method used by Laloo (unpublished) in determining the probability of remarriage.

5.3 CHAID is a convenient methodology for this sort of analysis as it can be used even if the variables are correlated with each other (Ritschard, 2013). In this dataset, age and education level are likely to be correlated with each other, for example.

5.4 In conducting the CHAID exercise, the minimum split size was set at 20 to ensure the reliability of the groupings. The minimum number of observations in terminal nodes was set at 20. A 10% level of statistical significance was used.

6. DATA GROUPINGS FOR THE CALCULATION OF REMARRIAGE RATES

6.1 The response variable used was whether the widowed individual had remarried or not. The predictor variables applied, as outlined in section 3.3 were education, race, duration of widowhood, sex and age.

6.2 The exercise was performed for all the widowed as well as on widows and widowers separately and a consistent tree structure was found each time. This tree structure, using the data from all the widowed individuals, is shown in Figure 1.

6.3 This analysis suggests that two tables of probabilities for remarriage are required. The first table is for widowed Africans with no distinction by age. The second table is for

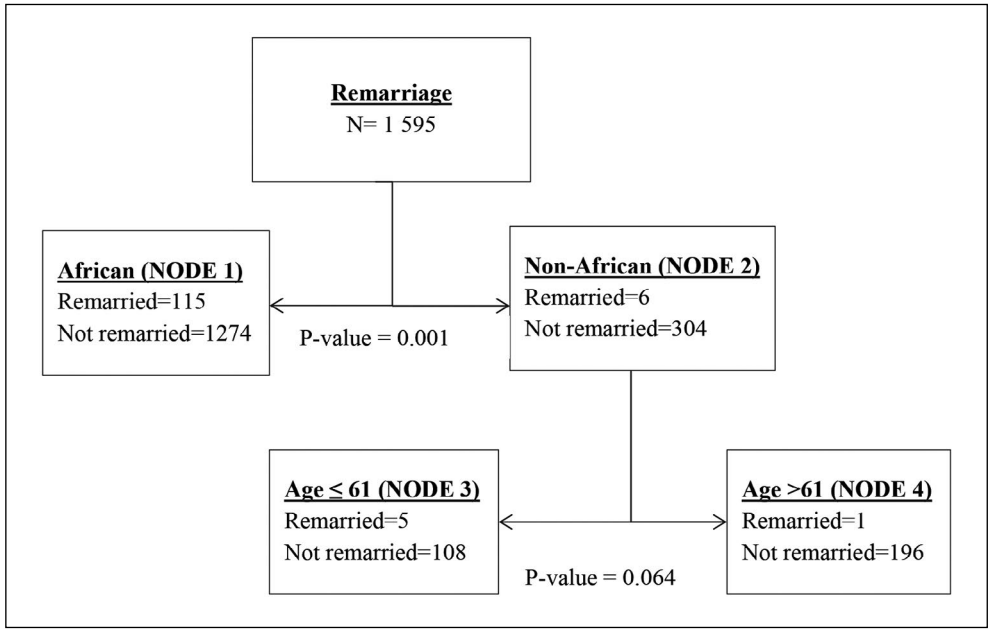

FIGURE 1. Tree diagram showing the results of the CHAID analysis

non-Africans where the probability of remarriage is calculated separately for those 61 and younger from those 62 and older.

6.4 Although the sample size of 1 595 widowed individuals may seem small, it is important to remember that this sample size is taken into account in the determination of the p-values. The sample size also compares favourably to the samples used in other studies to investigate the effect of factors on remarriage. For example, Davidson (2002) used a sample of 51 and Moorman et al. (2006) used a sample of 308.

6.5 The tree diagram shows that sex had no statistically significant effect on the propensity to remarry, even at a 10% significance level. This is somewhat surprising given that the literature in ¶2.1.1 suggested that widowers were expected to have higher remarriage rates than widows. This might be a result of the fact that widowers made up only 20.1% of the sample or may suggest that there is actually no sex effect.

6.6 Widowed Africans had significantly different remarriage rates to widowed non-Africans. The p-value of 0.1% indicates a high degree of statistical significance. It is important to note that CHAID cannot be used to prove causation. In other words, these results do not tell us that *all other things being equal*, an African widow or widower has different remarriage prospects to a non-African widow or widower. What the results do suggest is *that in the absence of other information*, the remarriage rates differ by race. This might be a result of underlying factors, including factors such as income, children, emotional support and health or might be a true race effect. In other words, race may be acting as a proxy variable.

6.7 It is interesting to note that the crude remarriage rates for Africans was approximately 8.3% as opposed to 1.9% for non-Africans. The literature discussed in ¶2.1.7 suggested that widowed Africans would have lower remarriage rates, not significantly higher rates. However, the most recent study in the literature was dated 2002 and hence the literature may be outdated. It is also noteworthy that Bumpass et al. (1990), Cleveland & Gianturco (1976) and Bramlett & Mosher (2002) did not study widowed South Africans.

6.8 There were no statistically significant differences by race in remarriage rates within the non-African group according to the CHAID analysis. This could reflect reality or could be a result of the small sample size, low remarriage rate within this group or age group simply being more significant.

6.9 Duration since widowhood was expected to be significant but was not found to be. This may be because at long durations, remarriage rates decrease with duration. However, remarriage rates also decrease with age and age was found to be significant for non-Africans. Hence the duration effect may no longer be significant once the age variable is taken into account.

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6.10 The relationship between age and remarriage rate for non-African widows is not statistically strong. The Bonferroni adjusted p-value was 0.064. If only the first three waves of NIDS data are considered, widowed individuals under the age of 55 of all races were found to have significantly different remarriage rates than their older counterparts with a p-value of 0.005 (Laloo, unpublished). This decrease in the importance of current age to remarriage prospects should be tracked over future waves.

6.11 Education level was not found to be statistically significant. The literature discussed in 2.1.5 only found weak evidence for this relationship and hence this result is not overly surprising.

6.12 It is noteworthy that many of the findings of this analysis contrasted with previous literature. Notwithstanding the arguments presented above, one possible explanation might be that the literature is not directly applicable to widowed South Africans.

6.13 This could be a result of the literature being drawn from other countries and regions, for example:
— United States of America: Gentry & Shulman (1988), Carr (2004), Moorman et al. (2006), and Bramlett & Mosher (2002);
— Canada: Wu et al. (2015);
— United Kingdom: Davidson (2002); or
— Europe: Ahn (2005).

6.14 Alternatively, it may be because the data contained younger individuals than those included in some studies, for example Davidson (2002), Carr (2004) and Ahn (2005).

6.15 Most literature on remarriage considered remarriage in general and not only remarriage after widowhood, for example Bumpass et al. (1990). Dewilde & Uunk (2008) considered only divorced women instead of widows. James & Shafer (2012) found that divorced individuals remarry more quickly than widows in general but this differs by demographic factors and hence data for the divorced may or may not be helpful.

7. METHODOLOGY TO DETERMINE REMARRIAGE PROBABILITY

7.1 Willekens et al., (1982) and Smith et al. (1991) used a multiple-decrement model with Kolmogorov forward equations and a hazard rate model respectively to estimate the probability of remarriage. Neither of these methods were suitable for the NIDS data.

7.2 Thomson (1988) assumed that duration in widowhood was significant due to the literature available at the time and the existence of this relationship in UK data. This necessitated the creation of a select remarriage rate table where the select period was duration since widowhood. However, the results discussed in section 6 show that such a select table is not required.

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7.3 The Kaplan-Meier estimator was used to find the probability of a widow remaining unmarried after a number of years.

7.4 The population was divided into the three terminal nodes from Figure 1. Within each group the number of years for which the widow has been widowed until the year of investigation or date of remarriage was identified. The exposed to risk for each year after widowhood was determined by finding the number of widows who have been widowed for at least that specific number of years at the date of investigation.

7.5 The widowed population not remarried after a particular duration was divided by the starting population to give the probability of remaining in the widowed state after a particular duration.

7.6 The force of remarriage was then estimated assuming that it was constant over all durations in each terminal node. This means that the instantaneous probability of remarriage does not differ by duration.

8. THE PROBABILITY OF REMARRIAGE: RESULTS AND DISCUSSION

8.1 The resultant forces and probability of remarriage are shown in Table 1.

TABLE 1. Forces of remarriage per group

Category	Force of remarriage	Annual probability of remarriage	Probability of remarriage before age 65
African	0.01440	1.4297%	8.3%
Non-African ≤ 61	0.00754	0.7512%	0.5%
Non-African > 61	0.00085	0.0850%	0.044%

8.2 The remarriage rates for both racial groupings are lower than those calculated by Laloo (unpublished) using only the first three waves of the NIDS data. These differences are particularly marked for younger widows. Mathematically, this is a result of very few remarriages recorded in waves 4 and 5 and an increased time period in which marriages could take place.

9. METHODOLOGY FOR CALCULATING THE CONTINGENCY DEDUCTION

9.1 Thomson's (1988) methodology for calculating the contingency deduction

9.1.1 Thomson (1988) suggests that the deduction can be expressed as a combination of the widow's future pecuniary gain from potential remarriage during the time that her late husband would have been alive and the value of the widow's future pecuniary loss from the loss of her late husband.

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9.1.2 Thomson (1988) suggests that the value of the widow's future pecuniary loss from the loss of her late husband can be expressed as:

$$V_w = I_1 \int_s^{n_1} \left(\frac{Lm(x_1+t)}{Lm(x_1)} \right) \left(\frac{Lf(y+t)}{Lf(y+s)} \right) \exp\left(-\delta_i (t-s)\right) dt.$$

The terms used in the equation are defined as:

— s denotes the period that has elapsed between the date of delict and the date of settlement.
— y denotes the age of the widow at the date of delict.
— x_1 denotes the age of the late husband at the date of delict.
— I_1 denotes the widow's share of the net annual income of the late husband.
— $L_m(x_1)$ denotes the number of males in the model population in the age interval (x_1, x_1+dx) subject to the mortality of the specific population according to the life table for that population.
— $L_f(x)$ denotes the number of females in the model population in the age interval $(x, x+dx)$ subject to the mortality of the specific population according to the life table for that population.
— x_1+n_1 denotes the age at which the late husband would have ceased to earn an income but for his death.
— δ_i denotes the excess of the force of interest (net of tax) over the force of growth in the widow's share of net annual incomes.

9.1.3 Thomson (1988) expresses the widow's future pecuniary gain from potential remarriage during the time that her late husband would have been alive as:

$$V_r = I_2 \int_s^{n_1} \left(\frac{Lm(x_1+t)}{Lm(x_1)} \right) \exp\left(-\delta_i (t-s)\right) \int_s^{t} \left(\frac{Lf(y+t)}{Lf(y+u)} \right) \left(\frac{Lm(x_2+t)}{Lm(x_2+u)} \right) \left(\frac{Lr(y+u)}{Lr(y+s)} \right) F_r(y,u)\, du\, dt.$$

The terms in the above equation are defined as:

— x_2 denotes the presumed age of a future husband at the date of delict.
— I_2 denotes the widow's share of the presumed net annual income of a future husband.
— $L_r(y+s)$ denotes the number of women who were widowed at age y and remained widows for at least s years.
— $F_r(y,u)$ denotes the force of remarriage of widows exactly u years after widowhood at exact age y in the model population.
— x_2+n_2 denotes the assumed age at which a future husband will cease to earn an income if he survives.

9.1.4 The remarriage contingency deduction per unit of the damages as calculated in a particular case is then:

$$V = \frac{V_r}{V_w}.$$

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9.2 Assumptions and parameterisation

9.2.1 Thomson's (1988) methodology required the use of mortality data and based on the remarriage rates described in section 8, sex affects the remarriage contingency only through the mortality rates applied. The mortality data were obtained from the Thembisa Model v 4.2. Since the NIDS data were initially collected in 2008 the mortality for this period was used in the calculation of the contingency deduction. It was assumed that all marriages were between heterosexual couples for ease of comparability to previous work.

9.2.2 Thomson (1988) found the remarriage contingency deduction as a proportion of the pecuniary loss of the widow assuming that the income of the new spouse is the same as the income of the late spouse, i.e. when $I_1 = I_2$. This corresponds with Steynberg (2007) but as discussed in ¶2.3.3, this assumption may not be appropriate in all circumstances. When $I_1 \neq I_2$ then we calculate V as if $I_1 = I_2$ and then determine it as:

$$V = \frac{I_2 V_r}{I_1 V_w}.$$

Also, if there are other deviations from the assumptions used for the calculation of V in this paper, so that the actual pecuniary loss before deduction for remarriage is V'_w, then, assuming proportionality, we may approximate the deduction using the formula:

$$V^* = \frac{V'_w}{V_w} V.$$

9.2.3 For the purposes of deriving the tables, it was assumed that all retirements happened at age 65. Hence $x_1 + n_1 = 65$ and $x_2 + n_2 = 65$.

9.2.4 A real discount rate of 2.5% was used to calculate the contingency deduction as this was in line with then current practice in RAF claims.

9.2.5 Thomson (unpublished) calculated remarriage contingency deductions for $s = 0$, $s = 1$, $s = 2$, $s = 3$ and $s = 4$. However, this is the select period that arises if the remarriage rate is contingent on duration since widowhood. No such select period was found in section 6 and hence $s = 0$ has been used to produce the contingency tables.

9.2.6 It is important to note that these formulae assume that the only way that the second marriage will end is through death. The formulae may over-estimate the contingency as the courts have noted that the remarriage may not last.[9]

10. CONTINGENCY DEDUCTIONS: RESULTS AND DISCUSSION

The contingency deductions calculated can be found in Appendices A and B. The tables show the deduction applicable to widowed individuals of different ages with the assumption of the new spouse aged 5 years younger (–5), the same age (0), 5 years older (5) or 10 years older (10) than the widowed. Appendix A contains the deductions applicable from the widow's point of view and Appendix B contains the deductions applicable from the

9 *LD* v *Road Accident Fund* (14606/2016) [2018] ZAGPPHC 181

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widower's point of view. It is of interest to compare the contingency deductions to those in Thomson (unpublished) for $s = 0$. This is shown graphically in Figure 2.

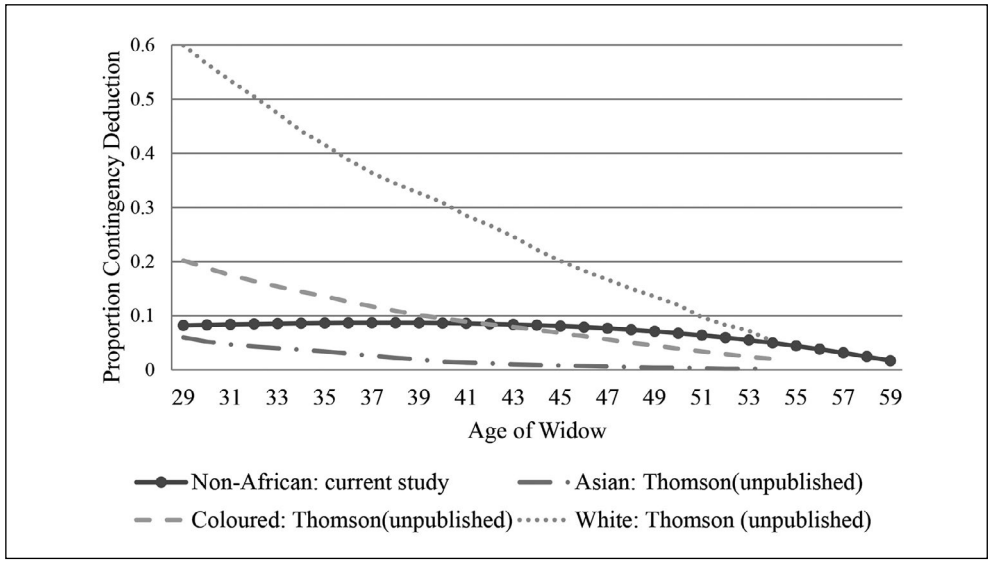

FIGURE 2. Contingency deductions from current and previous studies

10.1 Level relative to Thomson (1988)

10.1.1 It is clear that the contingency deduction for widowed whites is much higher in Thomson (1988) than what was calculated for non-Africans in this study even though the majority of widowed non-Africans are white. This study also suggests a reduced contingency deduction for widowed coloureds under 40 but a higher deduction for widowed coloureds over 40. This study suggests that widowed Asians/Indians would have higher contingency deductions at all ages than those calculated in Thomson (1988).

10.1.2 Koch (2011) suggests a contingency deduction for widowed Africans of 50% of the rates tabulated in Thomson (1988). However, these data suggest that the remarriage rate for widowed Africans is higher, not lower than for other groups. It is possible that this marked change is as a result of the recognition of customary marriages under South African law since 1998.[10]

10.1.3 A change in the level of remarriage rates, relative to 1988, is also unsurprising given that marriage is now only one of the ways that people can live together in mutual dependency (Steynberg, 2007). It is possible that some of the observed declines in remarriage are reflecting an increasing tendency to cohabit without marrying. In addition, changing income patterns within families now mean that a wife may have her own income. As discussed in section 2.1.6 and ¶2.2.2.2 this would affect the remarriage contingency.

10 Customary Marriages Act, Act 120 of 1998 as amended, Republic of South Africa

10.2 Level relative to the general contingency deduction

In *LD* v *RAF*,[11] the court found that the remarriage contingency could be catered for in the general contingency. The contingencies for the general hazards of life post-settlement date was 15%. The remarriage contingency deduction reaches 17.75% for widowed Africans and 9.20% for widowed non-Africans. These remarriage contingency deductions are thus high relative to the general contingency. This is unsurprising as the general contingency was not intended to cover remarriage.

10.3 Shape

10.3.1 The general trend in the deduction presented in Appendix B is cap-shaped. For Thomson's (1988) results, all three races showed a decreasing trend with Asians having the lowest contingency deductions at all ages and whites having the highest contingency deduction.

10.3.2 This change in shape may be a reflection of changing marriage age patterns. The median age at marriage and remarriage has been increasing over time and can be observed over as short a time span as five years (Statistics South Africa, 2021)

11. CONCLUSION

11.1 This represents the first attempt since Thomson (1988) to create remarriage contingency deductions for the South African population. These updated statistics may be useful for the courts. However, it is noteworthy that while the remarriage rates calculated allow for same-sex marriages, the remarriage contingencies presented in the appendices do not. The remarriage rates calculated are also more narrowly defined and hence lower than a more general repartnering contingency. The extension of the results for these circumstances is left to future research.

11.2 International literature suggests that race, sex, current age, duration since widowhood, income, children and education may all influence the probability of remarriage and financial circumstances on remarriage.

11.3 The NIDS data were unfortunately not useful for ascertaining the change in financial circumstances on remarriage. This is an important area of future research.

11.4 The data regarding income and children also meant that the impact of these factors on remarriage could not be thoroughly tested. Where income data were available it did not have a statistically significant effect, but data may not have been missing at random and being able to include these variables in future studies may lead to different results.

11.5 The data indicated that sex, education and duration since widowhood are not statistically significant determinants of the propensity to remarry, but race and current

11 *LD* v *Road Accident Fund* (14606/2016) [2018] ZAGPPHC 181

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age are. This suggests that in the absence of information regarding income and children, applying different remarriage contingency deductions based on age is appropriate and there are statistical grounds for having different remarriage contingencies for Africans and non-Africans. However, when interpreting these racial differences, it is important to remember that race may be acting as a proxy variable for economic factors.

11.6 The resultant remarriage contingencies indicate that the current contingency deductions are too high for white and younger coloured widows and too low for older coloured and Asian widows. Some preliminary suggestions as to the reasons for these differences are provided in the discussion, however an in-depth analysis is left for future research.

11.7 For all widowed South Africans, the remarriage contingency deductions for widows and widowers in their late 40s are fairly high relative to the standard post-settlement general contingency deduction of 15%. This suggests that, while an adjustment to this general contingency deduction may be one way to account for the remarriage contingency, as was done in *LD* v *RAF*,[12] this may result in the widowed party's loss being overstated.

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12 *LD* v *Road Accident Fund* (14606/2016) [2018] ZAGPPHC 181

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APPENDIX A
CONTINGENCY DEDUCTIONS FROM THE WIDOW'S POINT OF VIEW

TABLE A1. Contingency deductions for African females of different ages whose new spouse can be 5 years younger, the same age, 5 year older or 10 years older

Age of female	Age difference			
	–5	0	5	10
29	NA	0.150228	0.149456	0.143269
30	NA	0.152988	0.151457	0.144208
31	NA	0.155693	0.153347	0.144915
32	NA	0.158285	0.155086	0.145347
33	NA	0.16076	0.156647	0.145475
34	0.142921	0.163158	0.158011	0.1453
35	0.145642	0.165459	0.159151	0.144801
36	0.148325	0.16765	0.160044	0.143933
37	0.15093	0.16971	0.160661	0.142662
38	0.153452	0.171606	0.16097	0.140965
39	0.155911	0.173296	0.16095	0.138807
40	0.158286	0.174748	0.160576	0.136165
41	0.160561	0.175932	0.159791	0.133001
42	0.162714	0.176814	0.158556	0.129269
43	0.164707	0.177349	0.156835	0.124923
44	0.16651	0.177527	0.154597	0.119921
45	0.168101	0.177328	0.151824	0.114232
46	0.169443	0.176678	0.148466	0.107812
47	0.170502	0.175533	0.144466	0.100626
48	0.171245	0.173859	0.139776	0.092661
49	0.171652	0.171615	0.134344	0.083902
50	0.171701	0.168774	0.128126	0.074352
51	0.171333	0.165289	0.121081	0.064
52	0.170504	0.161099	0.113168	0.052827
53	0.169179	0.156147	0.104368	0.040821
54	0.16731	0.150362	0.094659	0.028011
55	0.16486	0.143683	0.08403	NA
56	0.161769	0.136048	0.072459	NA
57	0.157968	0.127397	0.059912	NA
58	0.153398	0.117703	0.046372	NA
59	0.147992	0.106936	0.031868	NA
60	0.141693	0.095088	NA	NA
61	0.134446	0.082135	NA	NA
62	0.126185	0.068037	NA	NA
63	0.11687	0.052763	NA	NA
64	0.106454	0.036336	NA	NA

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TABLE A2. Contingency deductions for non-African females of different ages whose new spouse can be 5 years younger, the same age, 5 year older or 10 years older

Age of female	Age difference			
	–5	0	5	10
29	NA	0.082019	0.082008	0.077794
30	NA	0.083272	0.082932	0.078156
31	NA	0.084484	0.083793	0.078392
32	NA	0.08562	0.084569	0.078481
33	NA	0.086678	0.085248	0.078402
34	0.073832	0.087677	0.085824	0.078155
35	0.074771	0.088605	0.08628	0.077729
36	0.075651	0.089458	0.086602	0.077102
37	0.076447	0.090221	0.086776	0.076268
38	0.077152	0.090878	0.086779	0.075213
39	0.077771	0.091408	0.086598	0.073922
40	0.078288	0.091789	0.086221	0.072382
41	0.078691	0.092002	0.085618	0.070578
42	0.078913	0.09199	0.084784	0.068488
43	0.078975	0.091761	0.083697	0.066086
44	0.078858	0.091302	0.082345	0.063352
45	0.07854	0.090602	0.080719	0.060268
46	0.077991	0.089622	0.078795	0.056809
47	0.077182	0.088335	0.076548	0.052962
48	0.076077	0.086713	0.073951	0.048728
49	0.074648	0.084729	0.070977	0.044098
50	0.072864	0.082351	0.067602	0.03906
51	0.070677	0.079545	0.063804	0.033591
52	0.068039	0.07626	0.059565	0.027711
53	0.064849	0.072396	0.054886	0.021409
54	0.061081	0.067917	0.049753	0.014686
55	0.056658	0.062736	0.044145	NA
56	0.051482	0.056742	0.038031	NA
57	0.045333	0.049702	0.031427	NA
58	0.03814	0.041493	0.024321	NA
59	0.029704	0.031776	0.016708	NA
60	0.019767	0.019956	NA	NA
61	0.007968	0.004848	NA	NA
62	0.007469	0.004013	NA	NA
63	0.006912	0.003112	NA	NA
64	0.006292	0.002142	NA	NA

APPENDIX B
CONTINGENCY DEDUCTIONS FROM THE WIDOWERS POINT OF VIEW

TABLE B1. Contingency deductions for African males of different ages whose new spouse can be 5 years younger, the same age, 5 year older or 10 years older

Age of male	Age difference			
	–10	–5	0	5
29	NA	NA	0.150228	0.142921
30	NA	NA	0.152988	0.145642
31	NA	NA	0.155693	0.148325
32	NA	NA	0.158285	0.15093
33	NA	NA	0.16076	0.153452
34	NA	0.149456	0.163158	0.155911
35	NA	0.151457	0.165459	0.158286
36	NA	0.153347	0.16765	0.160561
37	NA	0.155086	0.16971	0.162714
38	NA	0.156647	0.171606	0.164707
39	0.143269	0.158011	0.173296	0.16651
40	0.144208	0.159151	0.174748	0.168101
41	0.144915	0.160044	0.175932	0.169443
42	0.145347	0.160661	0.176814	0.170502
43	0.145475	0.16097	0.177349	0.171245
44	0.1453	0.16095	0.177527	0.171652
45	0.144801	0.160576	0.177328	0.171701
46	0.143933	0.159791	0.176678	0.171333
47	0.142662	0.158556	0.175533	0.170504
48	0.140965	0.156835	0.173859	0.169179
49	0.138807	0.154597	0.171615	0.16731
50	0.136165	0.151824	0.168774	0.16486
51	0.133001	0.148466	0.165289	0.161769
52	0.129269	0.144466	0.161099	0.157968
53	0.124923	0.139776	0.156147	0.153398
54	0.119921	0.134344	0.150362	0.147992
55	0.114232	0.128126	0.143683	0.141693
56	0.107812	0.121081	0.136048	0.134446
57	0.100626	0.113168	0.127397	0.126185
58	0.092661	0.104368	0.117703	0.11687
59	0.083902	0.094659	0.106936	0.106454
60	0.074352	0.08403	0.095088	NA
61	0.064	0.072459	0.082135	NA
62	0.052827	0.059912	0.068037	NA
63	0.040821	0.046372	0.052763	NA
64	0.028011	0.031868	0.036336	NA

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TABLE B2. Contingency deductions for non-African males of different ages whose new spouse can be 5 years younger, the same age, 5 year older or 10 years older

Age of male	Age difference			
	–10	–5	0	5
29	NA	NA	0.082019	0.073832
30	NA	NA	0.083272	0.074771
31	NA	NA	0.084484	0.075651
32	NA	NA	0.08562	0.076447
33	NA	NA	0.086678	0.077152
34	NA	0.082008	0.087677	0.077771
35	NA	0.082932	0.088605	0.078288
36	NA	0.083793	0.089458	0.078691
37	NA	0.084569	0.090221	0.078913
38	NA	0.085248	0.090878	0.078975
39	0.077794	0.085824	0.091408	0.078858
40	0.078156	0.08628	0.091789	0.07854
41	0.078392	0.086602	0.092002	0.077991
42	0.078481	0.086776	0.09199	0.077182
43	0.078402	0.086779	0.091761	0.076077
44	0.078155	0.086598	0.091302	0.074648
45	0.077729	0.086221	0.090602	0.072864
46	0.077102	0.085618	0.089622	0.070677
47	0.076268	0.084784	0.088335	0.068039
48	0.075213	0.083697	0.086713	0.064849
49	0.073922	0.082345	0.084729	0.061081
50	0.072382	0.080719	0.082351	0.056658
51	0.070578	0.078795	0.079545	0.051482
52	0.068488	0.076548	0.07626	0.045333
53	0.066086	0.073951	0.072396	0.03814
54	0.063352	0.070977	0.067917	0.029704
55	0.060268	0.067602	0.062736	0.019767
56	0.056809	0.063804	0.056742	0.007968
57	0.052962	0.059565	0.049702	0.007469
58	0.048728	0.054886	0.041493	0.006912
59	0.044098	0.049753	0.031776	0.006292
60	0.03906	0.044145	0.019956	NA
61	0.033591	0.038031	0.004848	NA
62	0.027711	0.031427	0.004013	NA
63	0.021409	0.024321	0.003112	NA
64	0.014686	0.016708	0.002142	NA

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