PAPER ON THE DEVELOPMENT OF STANDARD FORMULAE FOR CALCULATION OF LOSS OF EARNINGS, LOSS OF SUPPORT AND GENERAL DAMAGES FOR THE ROAD ACCIDENT FUND (RAF)

PUBLIC COMMENT PAPER

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ACRONYMS / ABBREVIATIONS

ABBREVIATION	MEANING
ADR	Alternative Dispute Resolution
ALM	Asset Liability Model
DDDM	Data Driven Decision Making
GDS	General Damages
IT	Information and technology
LoE	Loss of Earnings
LoS	Loss of Support
ERA	Expected Retirement Age
NATIS	National Administration Traffic Information System
PCDP	Public Comment Discussion Paper
PFMA	Public Finance Management Act
RABS	Road Accident Benefit Scheme
RAF	Road Accident Fund
RTIS	Road Traffic Injuries
SF	Standard Formula
SFP	Standard Formula Project
VSM	Value Stream Map(ping)
WHO	World Health Organisation

EXECUTIVE SUMMARY

1. The RAF is currently beleaguered by procedural delays and processual inefficiencies, largely due to its predominant reliance upon human intervention within the traditional claim system characterised by lodgement of comparatively antiquated, manual and paper-based claims. These unautomated processes and non-digitalised procedures heavily depend upon the subjective assessments and subsequent written reports made by the multi-functional panel of experts which includes, among others, medical practitioners, actuarial specialists, legal professionals (attorneys), industrial psychologist and educational psychologists. Consequently, the RAF encounters average processing backlogs spanning three to five years, alongside significant discrepancies in compensation benefits. These discrepancies arise from the diverse criteria applied by different experts in evaluating General Damages (GDs), Loss of Earnings (LoE), and Loss of Support (LoS).

Summary of Main Points

2. Presently, the RAF claim procedure is characterised by its protracted turn-around times, complexity, lack of transparency, and dependence on the subjective and objective contributions from a plethora of clinical, legal, and actuarial experts. These contributions are crucial for the RAF's determination of settlement amounts.

3. The prevailing process is marred by subjective inputs and non-uniform judgments from medical, legal, and actuarial professionals.

4. The predominant reliance on subjective judgment has propagated disparities in settlement values for comparable road traffic injuries. This leads to inequity in settlement values.

5. Claimants without legal representation are more financially prejudiced in comparison to those whose claims are submitted and expedited by adept attorneys, who, in consequence, secure larger settlement values.

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Purpose of Proposed Solution

6. In response to these challenges, the RAF seeks to develop a standardised formulae for the accurate calculation of settlement values for Loss of Earnings (LoE), Loss of Support (LoS), and General Damages (GDs). Additionally, the creation of a streamlined online interactive platform to facilitate the computation of settlement amounts. This platform is to be complemented by the development of stringent medical categorisations for road traffic injuries, underpinned by international best practices and driven by research-based data.

GENERAL DAMAGES

7. The construed unfair and equitable payout for general damages cannot be argued against as there have been road accident victim cases with similar injuries that were compensated at different quantum amounts. This, despite all meeting the minimum criteria for general damages payout of at least 30% Whole Person Impairment (WPI) as dictated to by the current RAF Act and its Regulations.

8. Whilst the regulatory provisions determine the minimum criteria to be met for compensation, the silence on how this must be equitably executed has led to the current state of the unequal payouts. It therefore follows, without doubt that the determination of how these payouts must be carried out, and the calculation of the quantum thereof must be standardised to ensure equitable payout.

9. The derivation of a formula to calculate General Damages (GDs), cannot be based on anything else but the criteria that has already been established for the qualification for GDs. In ensuring that this formula takes all relevant and significant factors into account, a process of benchmarking against other social systems-based compensation benefits has led to the base consideration of the following:

9.1. The degree of impairment (WPI) is mandatory to be included in the formula.

9.2. A set fee or amount against which the degree of impairment has to be factored against, this shall be called VLGD (Value of Life for General Damages)

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10. The VLGD shall be determined using methods of the statistical nature and be benchmarked against other jurisdictions, where such exist.

11. Internal RAF data can be used to determine the shape of the payout distribution possibly with some adjustments to the quantum of payouts. Based on the other social system-based compensation, a cap shall also be considered.

12. The VLGD, as determined, shall also consider the gender specific determinations that may influence the cap and thus VLGD shall have consideration for gender while ensuring equity among the sexes.

13. When considering the above, it follows that the following derivation method to calculate the payout may as a factor of:

Payout For General Damage is a factor of:

13.1. WPI

13.2. VLGD.

14. When considering the above, and comparing against other social systems based compensation payouts, the formula is directly in line with these systems. However, the said systems have age of the claimant as an active exclusion as they cater for the working population of above 16 years of age.

15. Road accidents, and the general damages payout, are not segregating according to age thus the consideration for age as a factor.

16. The determination of whole person impairment based on the AMA Guides, is of such a nature that the determination of WPI is not entirely possible for children before bone maturation age. To this end, the inclusion of age needs to be factored accordingly to allow the inclusion of children in WPI determination as well as the inclusion of age as a factor in the payout formula.

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17. The adjustment to be done can only be considered once, so as not to prejudice the road accident victim. The relaxation of inclusion of children in the determination of WPI, is thus mandatory to be passed as a jurisdictional determination for the purposes of calculating General Damages in children and not for any other purpose. This exercise, is doing exactly this, namely:

17.1. Passing a jurisdictional determination to include children who have not reached bone maturity in the determination of WPI,

17.2. The factoring of age in the formula for the calculation of General Damages.

18. Therefore considering the argument about age, the calculation must then factor the following factors:

18.1. WPI

18.2. VLGD

18.3. Age

WPI as a Factor

19. The use of the AMA Guides has for some time been considered complex to the general doctor despite training. This complexity is appreciated and needs to be considered. As part of this consideration, the AMA Guides have been extensively analysed and a proposed jurisdiction determination proposed. This proposed jurisdictional is the use of the average classes in the AMA Guides tables, instead of the complex grade adjustment as contained in the methodologies.

20. It follows from the use of these averages that corresponding averages for the WPI in the formula, after categorisation should be factored in.

21. When considering the above argument in the formula for general damages payout, the calculation must consider the following:

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Payout For General Damage

21.1. Average of Category based on WPI

21.2. VLGD

21.3. Age

22. This categorisation of the WPI, shall be considered in ranges of 10's above 30% (minimum severity level), thus creating the following categories:

Table 1: Category classification

Category Classification	**WPI Range (%)**	**Average of Category based on WPI (%)**
Category 1	30 – 40	35
Category 2	41 – 50	45
Category 3	51 – 60	55
Category 4	>60	80

23. There are few cases that are actively above 60% WPI and hence the grouping of these into one category. The above categorisation thus classifies all non-serious injuries to be Category 0 and by default all that are less than 30%.

24. This categorisation is important to note the following on:

24.1. Single injuries may be easily categorised into each of the above categories.

24.2. Multiple injuries, as is common in road accidents, have to be considered and a combination method used to determine the WPI at the level of each injury before final categorisation.

24.3. Some single injuries may in themselves be leading to a high WPI immediately at the time of injury, e.g. Amputation at shoulder level.

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25. When considering the last scenario in the above categorisation, such injuries may then be considered for quick processing with minimal intervention at the time of injury. For this to be done, the following shall be the conditions to be met before minimal intervention can be considered.

25.1. Causality must have been established,

25.2. Liability must have been accepted by the RAF given the internal processes used to accept liability,

26. The above process of categorisation, lends the great possibility of mapping injuries in the acute phase, based on ICD10, to be mapped based on outcomes, where such outcomes are either; favourable, or guarded or adverse extreme in nature; to the WPI likely to be reached at the time of maximum medical improvement (MMI).

Apportionment

27. Quantified pre-existing injuries and diseases, have an impact on the final WPI. Where a database exist for each patient of the pre-existing WPI as a result of the pre-existing injuries or disease, the resultant WPI should be apportioned accordingly. In the South African context, such a database does not exist and would thus be difficult to establish so as to factor it in the WPI.

28. This, thus creates the next factor for consideration, the chronic diseases and pre-existing conditions impacting the final impairment. This factors that must be considered when adjusting the payout are:

Payout For General Damage

28.1. Average of Category based on WPI

28.2. VLGD

28.3. Age

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28.4. Pre-existing medical conditions Factor

29. It is important to note that the Payout above is a function. The exact formula will be derived post research on obtaining appropriate and testing the suitability of various formulas to arrive at the best fit.

Narrative Test

30. The RAF Act provides the four other scenarios where there may be a payout for general damages. This is referred to as the Narrative Test. This has been incorrectly interpreted and adulterated to the point of introducing subjectivity. It is the proposal of this process, that the four scenarios as contained in the provisions, be applied objectively without introducing subjective interpretation.

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LOSS OF EARNINGS

Current Practice

31. The current practice followed by the RAF in the calculation of the Loss of Earnings is to estimate future Loss of Earnings through postulations considering current earnings and future earnings for both the pre-accident and post-accident scenario.

32. The uncertainty of these postulations and the assumptions they are based on increases when considering post-accident projections as there are difficulties in assessing the level of impairment and functional capability into the future.

33. Minors and unemployed claimants present different challenges when projecting their earnings.

34. It is necessary for the RAF as a social benefit scheme to formulate a standard approach for compensation of its claimants in an equitable way.

Challenges with Current Landscape

35. The use of overly optimistic/pessimistic scenarios.

36. Expert judgement used in postulations is based on limited knowledge about future that affect future earnings.

37. Large variability in the derived postulations between individual claimants with similar circumstances.

Proposed Solution

Classification of claimants into cohorts

38. The RAF proposes an approach that first classifies claimants for Loss of Earnings into three cohorts, as described below.

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38.1. WorkForce: Unemployed, formal and uninformal, employment, and self-employed.

38.2. PSET: Post-matric status described by SAQA NQF level 5 and above

38.3. School: Pre-matric status described by South African Qualification Authority's (SAQA) National Qualification Framework (NQF) level 1 through to 4.

39. Following identification of the individual claimant's relevant cohort, it is essential to consider the other elements of the earnings projection, i.e., earnings (current and future) both pre-accident and post-accident, as well as life expectancy.

Occupational classifications

40. Occupational classification is a major factor of earnings projections. Occupational classification depends on which cohort a claimant is in. For each cohort, likely earnings are a product of transitional progress of the claimant's education and/or employment prospects. The following transitional probabilities will need to be estimates to enable earnings projection:

40.1. Workforce:

a. Probability of obtaining employment in one of the employment industries given the education background.

40.2. PSET:

a. Probability of graduating PSET and entering the workforce. The workforce model is adopted after this transition.

b. Probability of entering the workforce without graduating PSET. The workforce model is adopted after this transition.

40.3. School:

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a. Probability of graduating matric and entering PSET. The PSET model is adopted after this transition.

b. Probability of entering the workforce without graduating matric. The workforce model is adopted after this transition.

Data and Assumption requirements

41. The RAF will make use of analytical information with respect to transitional probabilities in line with claimants' path in Figure 2.

42. Earnings need to be normalized with respect to inflation while standard mortality tables need to be adjusted for medical conditions arising from the accident.

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LOSS OF SUPPORT

Current Landscape

43. The current practice of calculating LoS benefits is based on a pre-defined proportion of the deceased loss of earnings.

44. The proportion depends on whether the dependent is a spouse, child, or parent

Challenges with Current Landscape

45. The current method does not consider the possibility of spousal divorce and therefore eliminating the need for spousal support in the future.

Proposed Solution

46. The solution proposes an adjustment to the base loss of earning that considers possible elimination of support due to some possible future event that affect the dependent relationship. The events to consider are:

    46.1. Spouse: Spousal support should factor possibilities of divorce and/or remarry.

    46.2. Child support: Child support should factor age post which child support will cease.

    46.3. Parent: Parent support should consider possibility of death of a parent.

47. Deceased loss of earning should be based on LoE models described earlier, assuming a special, unlikely event where post-accident WPI is 100%.

Data and Assumption requirements

48. Probabilities of spouse remarriage and mortality tables.

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USER INTERFACE DESIGN

49. **Landing Page:** The entry point to the system, featuring the company logo and name, providing users with a familiar and branded interface.

50. **Login Page**: Users can securely access their accounts by entering their username and password. Forgot Password and Sign-Up options are available for password recovery and new user registration, respectively.

51. **Application Management** Page: After successful login, users are directed to the Application Management page, where they can view details of their applications, manage claims, update their profiles, and access report pages.

52. **Update Details Page**: Users can easily update their profile information, including username, password, email address, and other relevant details, ensuring accurate and up-to-date user data.

53. **Capture Claim Page**: Users can submit new claims through the Capture Claim page, providing essential details and information about their claims, such has loss of earnings, loss of support, and general damages.

54. **Report Page:** Users can access detailed reports and assessments related to their claims through the Report page, allowing them to review assessments of damages, injuries, and other relevant details. Reports can be downloaded for offline viewing or reference.

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CHAPTER 1: BACKGROUND

ROAD ACCIDENT INJURIES AND SURVIVORS

55. The global annual toll from Road Accident Injuries (RTIs) stands at a staggering loss of 1.3 million lives, with an additional 20 to 50 million survivors enduring permanent injuries and the resultant pain. These injuries, which include but are not limited to long-term disabilities such as paraplegia, quadriplegia, total visual impairment, brain damage, and the socio-emotional stigma associated with disfigurement, necessitate social insurance claims for Loss of Earnings (LoE), Loss of Support (LoS), and General Damages (GDs). The World Health Organisation (WHO) reports that around 60% of the 1.3 million road traffic injury fatalities occur among individuals aged 15 to 44, an age bracket that is crucially economically active. As such, road accident injuries are identified as the ninth leading cause of death worldwide among the 15 to 29 age group (WHO, 2022).

56. The incidence of road deaths is notably higher in the emerging economies of Africa, despite these regions having a relatively minor share of the world's motor vehicle ownership. Libya, located in North Africa, records the highest rate of road deaths with 73.4 fatalities per 100,000 people. In Southern Africa, Malawi leads with 35 deaths per 100,000 people. Within South Africa, Statistics South Africa (StatsSA) (2021) indicates that the country ranks 42nd globally, with a death rate of 25.1 per 100,000 people. Further supporting data from StatsSA (2022) and the National Traffic Information System (NATIS) (2023) highlight that the approximately 13 million registered motor vehicles in South Africa contribute to around 40 road fatalities daily, primarily due to poor driving behaviour on the roads.

LEGAL AND INSTITUTIONAL BACKGROUND OF RAF

57. The South African government, recognising the severe impact of road accident injuries and the resultant fatalities, as evidenced by global statistics, established the Road Accident Fund (RAF) through the enactment of the RAF Act No 56 of 1996. This legislation introduced a social benefit fund aimed at providing a compensatory safety net for victims of road accidents on South African roads, in line with the RAF Act

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of 1996. This initiative reflects the government's commitment to fulfilling Section 27 of the Constitution, which guarantees access to social security for all citizens.

58. Originally, the RAF was instituted as a fault-based system, necessitating the identification of a culpable party who would then be shielded from litigation concerning damages inflicted on other road users. This framework, as delineated in the RAF Act of 1996 and its amendments, was designed to ensure accountability and provide relief to victims.

59. The RAF provides the following:

59.1. Financial Benefit: This includes compensation for death, funeral expenses, medical expenses, loss of earnings and general damages incurred by a victim of road accidents.

59.2. Rehabilitation Services: For victims whose post-accident physical abilities are impaired by road accidents, the compensation covers medical treatments, physical therapy, vocational training to help victims to sustain themselves independently.

59.3. Legal Assistance: This includes empowerment of victims with legal knowledge to raise their awareness of legal rights they have including the rights to fair compensation.

59.4. Public Safety: The RAF undertakes initiatives to promote public safety on public roads in South Africa.

59.5. Support for Families: Upon the loss of a loved one through death, RAF provides financial assistance, counselling services and bereavement support.

RAF OPERATIONAL HISTORY

60. The RAF is a Schedule 3A Public entity according to the Public Finance Management Act (PFMA). In its current form as a fault-based, road accident social benefit compensation scheme in South Africa, the Road Accident Fund is a fifth-generation compensation scheme with a long ancestry dating back to 1942 when the Motor

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Vehicle Insurance Act of 1942 was promulgated. Originally underwritten and administered by a consortium of private sector insurers, the Motor Vehicle Insurance Act of 1942 was funded by compulsory annual premiums collected from South African motorists. Over the three decades of its existence prior to 1972, this maiden Motor Vehicle Insurance Scheme was subjected to four Commissions of Enquiry focusing on challenges associated with management of liabilities thereof. Only eight years after enactment of the Motor Vehicle Insurance Act of 1942, The Smit Commission of 1950 was set up, followed some four years later by the Corder Commission of Inquiry in 1954, thereafter the Du Plessis Commission of Inquiry of 1954 was the penultimate one before the final Moll Commission of Inquiry of 1964.

61. The second generation of statutory road compensation schemes were born with the enactment of the Compulsory Motor Vehicle Insurance Act of 1972. Like its predecessor Motor Vehicle Insurance Act of 1942, it was subjected to two Commissions of Inquiry namely the Wessels Commission of Inquiry (Van Wyk et al, 2019) and the Grosskopf Commission of Inquiry in 1981.

62. In 1986, the Motor Vehicle Accidents Act was passed with an innovative provision allowing for the introduction of a fuel levy to fund the compensation system. It was only reviewed once in 1987 under the auspices of the Viviers Commission of Inquiry.

63. Thereafter, the Multilateral Motor Vehicle Accidents Fund Act of 1989 ushered the fourth statutory road compensation scheme in South Africa. Like its immediate predecessor, it was subjected to only one Commission of Inquiry pursuant to an actuarial deficit in the sum of R1 billion which was presided over by the Melamet Commission of Enquiry in 1992 (Van Wyk et al, 2019).

64. Finally, the current Road Accident Fund (RAF) was born out of the enactment of the Road Accident Fund (RAF) Act of 1996 as a fifth-generation statutory road accident compensation scheme in South Africa. The most remarkable amendments to the RAF Act are the Road Accident Fund Amendment Act of 2005 which became effective on 1 August 2008. This was followed by the Satchwell Commission of 2002 which reviewed the equitability and affordability of the fund in view of the sustainability of compensating road accident victims in an inclusive way.

RAF HISTORICAL PRACTICE

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65. The Road Accident Fund (RAF) is a national public entity of South Africa listed according to schedule 3A of the Public Finance Management Act (PFMA) 1 of 1999. The RAF is an entity of the Department of Transport (DoT) and is a juristic person established by an Act of Parliament, namely the Road Accident Fund Act, 1996 (Act No. 56 of 1996), as amended (the RAF Act). Section 3 of the RAF Act stipulates that the objective of the Fund is the payment of compensation in accordance with the Act for loss or damage wrongfully caused by the driving of a motor vehicle.

66. The Road Accident Fund (RAF) functions as a government-backed public compensation scheme accessible to all road users across South Africa.

67. Tasked with providing compulsory social benefit coverage to South African road users, the RAF's responsibilities extend to the rehabilitation and timely compensation of road traffic injury claimants and their dependents affected by negligent driving. It also aims to promote safer road usage within the country.

68. Benefits under the RAF include General Damages, Funeral, Past and Future Medical Expenses, and Loss of Earnings (LoE), with Loss of Support (LoS) benefits designated for the dependents or beneficiaries of deceased claimants, contingent upon a verified breadwinner/guardian relationship.

69. The appraisal of monetary values for General Damages (GDs), Loss of Earnings (LoE), and Loss of Support (LoS) is conducted the RAF.. The RAF utilises The Quantum Yearbook by R.J. Koch (Quantum Yearbook) to ascertain settlement amounts for claimants.

70. The adjudication process for General Damages (GDs) by the RAF is initiated when the primary International Classification of Diseases (ICD) 10 code for the injuries sustained or subsequent complications are listed in the RAF Serious Injuries List. A Whole Person Impairment (WPI) rating of 30% or above, as per the American Medical Association (AMA) Guidelines, triggers awards for GDs. Conversely, WPI ratings below the stipulated 30% threshold often leads to the application of subjective narrative tests, underpinned by medical experts' reports, which have been subjective, thus leading to inequity in awarding GDs.

RAF SUSTAINABILITY CHALLENGES

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71. The RAF is currently beleaguered by procedural delays and processual inefficiencies, largely due to its predominant reliance upon human intervention within the traditional claim value chain characterised by lodgement of comparatively antiquated, manual and paper-based claims. These unautomated processes and non-digitalised procedures heavily depend upon the subjective assessments and subsequent written reports made by the multi-functional experts which includes, among others, medical practitioners, actuarial specialists, legal professionals (attorneys), industrial psychologist and educational psychologists. Consequently, the RAF encounters significant discrepancies in compensation benefits. These discrepancies arise from the diverse criteria applied by different experts in evaluating General Damages (GDs), Loss of Earnings (LoE), and Loss of Support (LoS).

72. The Actuarial Society of South Africa (ASSA) has highlighted the critical need for the RAF to refine its management of actuarial liabilities. By addressing this need, the RAF could significantly conserve taxpayer funds, particularly by curtailing opportunistic Loss of Earnings (LoE) claims submitted by ineligible individuals with minor road accident injuries. In the fiscal year of 2021, ASSA estimated that the RAF could have saved approximately R3 billion in settlement values allocated for non-pecuniary losses, such as pain and suffering, which represented 14% of the R18.4 billion LoE compensation benefits disbursed in that period. Moreover, it was observed that the LoE settlement values adjudicated by the RAF were roughly 25 times higher than those determined by the Workman's Compensation Fund under the Compensation for Occupational Injuries and Diseases Act (COIDA), as administered by the Department of Labour (DoL). This significant disparity not only undermines the principle of equitable claimant justice but also exerts undue pressure on the RAF's financial resources.

73. This financial strain is further exacerbated by the substantial economic impact of road accidents, costing the national fiscus R34 billion and the wider economy R174 billion, respectively. As of 2022, the RAF also reported owing R10.6 billion in legal fees to its panel of attorneys, although efforts have been made to reduce this figure by 75% to R3 billion.

74. The preface of the White Paper on the Road Accident Fund, approved by the Cabinet on 21 January 1998, states: "The system has evolved from the original private insurance to public compensation. The demands of a new socio-economic and constitutional dispensation - and with them, the constraints on public spending – require a transition from a delict-based compensatory system to a system of affordable

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state benefits." The white paper further reiterates that "the RAF in future will have elements of social welfare in the form of state benefits and risk cover. The main objective of the RAF is to provide adequate medical care and benefits to road accident victims, within an affordable and sustainable financial framework." According to the Satchwell Commission, the RAF has been operating on a model that is unsustainable, unequal, unaffordable, and inefficient.

75. Summary of Main Points

75.1. Presently, the RAF claim procedure is characterised by its protracted turn-around times, complexity, lack of transparency, and dependence on the subjective and objective contributions from clinical, legal, and actuarial experts. The subjective an objective contributions vary from expert to expert. These contributions are crucial for the RAF's determination of settlement amounts.

75.2. The prevailing process is marred by subjective inputs and non-uniform judgments from medical, legal, and actuarial professionals.

75.3. The predominant reliance on subjective judgment has propagated disparities in settlement values for comparable road traffic injuries. This leads to inequity in settlement values.

75.4. Claimants without legal representation are more financially prejudiced in comparison to those whose claims are submitted and expedited by adept attorneys, who, in consequence, secure larger settlement values.

76. The Department of Transport (2023) has identified enduring liquidity challenges within the RAF, dating back to 1981. These challenges have precipitated a surge in litigation and administrative expenses, undermining the RAF's financial integrity. Moreover, claimants typically endure a protracted wait of three to five years to receive compensation.

77. There is currently also a lack of correlation between the RAF's income and expenditure (including both claims and administrative costs). This is further exacerbated by the uncertainty in the nature of claims incurred. This makes it difficult for the RAF to implement sustainability plans.

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PURPOSE OF THE SOLUTION PROPOSAL

78. In response to these challenges, the RAF seeks to develop a standardised formulae for the accurate calculation of settlement values for Loss of Earnings (LoE), Loss of Support (LoS), and General Damages (GDs). Additionally, the creation of a streamlined online interactive platform to facilitate the computation of settlement amounts. This platform is to be complemented by the development of medical categorisations for road traffic injuries, underpinned by international best practices and driven by research-based data.

79. These formulae aim to ensure uniform compensation for comparable injuries, taking into account the severity and permanence of impairment, and the impact of impairments on both physical and mental wellbeing.

80. The objective is to devise a solution that:

80.1. streamlines the claims process through a lean, agile, technology-enabled platform with a digital interface,

80.2. minimises inaccuracies in claims leading to uniform awards for injuries,

80.3. guarantees equity and fairness in the actuarial calculation of settlement amounts,

80.4. improves the overall efficiency of the RAF claims management system, and

80.5. decreases the variation in final awards to claimants.

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81. **RAF Medical Objectives**

81.1. The Medical objective is to utilise objective, evidence-based, and data-driven standardised injury and disability classifications with universal acceptance such as the World Health Organisation (WHO)'s International Classification of Diseases (ICD) 10 which are then linked to the actuarial formulae to derive compensation calculations, ensuring accuracy and fairness in the assessment process.

81.2. It ensures that these standardisations are developed in alignment with the unique demographics of South Africa, acknowledging the diversity and specific needs of its population.

81.3. The medical standardisation process is aimed at solidifying a consistent approach to determining the severity of injuries, which is crucial for equitable compensation.

81.4. Implement Standardised Occupational Categorisations to enable the derivation of statistically consistent educational and earnings projections in a repeatable manner, thus improving the reliability of compensation assessments.

81.5. To incorporate current labour-force market trends, education system dynamics, and income levels into the model inputs to ensure that the formulae are reflective of contemporary socio-economic conditions.

81.6. To ensure a smooth transition from medical inputs to the actuarial calculation, facilitating the standardisation of calculated values for compensation and ensuring a seamless integration between medical assessments and financial compensations.

82. **RAF Administrative Objectives**

82.1. Formulate equitable formulae that accurately reflect the background of each claimant, ensuring that all compensations are fair and considerate of individual circumstances.

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82.2. Streamline and standardise the claims process to improve economy, efficiency and effectiveness (3Es) which collectively contribute towards the improved accuracy. Overall, this should facilitate a smoother and more accessible procedure for all parties involved.

82.3. Augment the overall transparency, fairness, and reasonableness of RAF claim assessments, making the process more open and understandable to claimants.

82.4. Alleviate the administrative burden within the claims processing workflow by simplifying the process, inputs, and calculations involved in awarding compensations.

82.5. Enhance the speed and effectiveness with which claims are settled, thereby reducing waiting times for claimants and increasing satisfaction with the RAF services.

82.6. Foster equity among claimants and/or injured parties, ensuring that compensation is not influenced by the claimant's choice of representation or lack thereof.

82.7. Contribute to the sustainability of the RAF by implementing practices that are economically viable, socially equitable, and administratively efficient.

82.8. Minimise the necessity for litigation to resolve settlements, along with the associated time and costs, thereby reducing the strain on both the claimants and the RAF's resources.

THE BENEFITS OF STANDARDISATION

83. The following are key features and benefits of the Solution:

83.1. **Direct access of claimants to RAF:** The solution will create access to claimants that currently struggle to claim from the RAF due to the inaccessibility of certain experts.

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83.2. **Fairness and standardisation:** The solution means that the quantification of benefits is a lot more objective. This will bring about more fairness and equity in the distribution of claims.

83.3. **Digital:** The solution is designed to be digital. This will reduce paper waste and produce a more carbon friendly method of producing reports.

83.4. **Operational efficiencies:** The solution is designed to streamline the process of processing a claim.

83.5. **Certainty leads to sustainability:** The solution brings about more certainty for the RAF regarding potential claims payouts. This means the RAF can better plan to have sustainability.

83.6. **Limiting fraud:** The successful implementation of the solution will reduce the ability of internal and external stakeholders committing fraud against the RAF. This is because the standardisation of the formula will reduce the chances of over settlements occurring. This is also because of having a central location where everything is managed and stored. This should lead to better monitoring in general.

83.7. **Improvements and enhancements:** The solution will be continuously improved using a two-pronged approach:

a. User Feedback – Users provide feedback on areas that require improvement. The RAF will thus implement these corrective changes.

b. Research Approach – Research will continuously be utilised to improve the solution.

83.8. **Efficiency:** The solution is designed to be easily updateable. This means that the assumptions can be updated by the RAF.

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CHAPTER 2 : GLOBAL COMPARISONS

84. This section provides a comparison of road accident compensation schemes (or close equivalents) across six countries, juxtaposing three first-world nations (Australia, the United Kingdom, and Germany) against three third-world countries (Namibia, Botswana, and Brazil). It evaluates each scheme based on structure, benefits, eligibility, and funding, drawing parallels and contrasts with South Africa's Road Accident Fund (RAF). The aim is to identify best practices and areas for potential improvement in managing road accident compensations. The conversion of various currencies to ZAR utilised the average exchange rate that was prevalent in February 2024.

85. First-World Countries:

85.1. **Australia: Transport Accident Commission (TAC) and Similar State-Based Schemes**:

a. **Overview:** The TAC is a 'no-fault' insurance scheme owned by the Victorian Government. This means if you are injured in a transport accident in Victoria you can make a TAC claim to help pay for the treatment and support you need, even if the accident was your fault.

b. **Coverage:** Includes medical expenses, rehabilitation, income support if you can't work because of your accident injuries, return to work support for you and your employer and a lump sum payment if you are eligible for compensation.

c. **Benefits:**

Table 2: Transport Accident Commission benefits

Benefit	Detail	Compensation
Income support	Temporary benefit while you recover enough to return to work.	

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Loss of earnings	If you continue to have a reduced capacity for work 18 months after your accident, you may be eligible to receive a loss of earning capacity benefit.	Statutory maximum rates exist.
Safety net income benefit	To a claimant: • who has returned to work after suffering a "severe injury" and has an impairment score of 50% or more, and • who is then terminated from their job or can no longer remain self-employed after returning to work.	
Common law damages	Intended to compensate for pain and suffering and economic loss that is not covered under the TAC's no-fault benefits.	

d. **RAF Comparison:**

- Funding Mechanism:
  - TAC is funded through vehicle registration fees in the state of Victoria, creating a direct link between vehicle use and contributions to the compensation fund. This method ensures that all vehicle owners contribute to the fund.
  - RAF, on the other hand, is funded through a levy on fuel, making the funding source broader as it encompasses all fuel consumers, not just vehicle owners. This difference in funding mechanisms reflects divergent approaches to pooling resources for accident compensation.

- Fault Basis:

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- TAC operates on a no-fault basis, meaning compensation is provided regardless of who caused the accident. This approach facilitates quicker payouts and reduces the need for lengthy legal processes.

- RAF, in contrast, is mostly fault-based, requiring proof of fault in most cases. This can lead to more complex legal proceedings and potentially longer waiting times for compensation, affecting the efficiency of the system.

▪ Scope of Coverage:

- Both TAC and RAF cover a wide range of benefits, including general damages and income support. However, TAC's no-fault model allows for a more inclusive approach, potentially covering more claimants.

- RAF's fault-based system might exclude certain victims from compensation if they are found to be at fault, which can limit the scope of coverage compared to TAC's model.

85.2. **United Kingdom:**

85.2.1. If a vehicle involved in an accident in the United Kingdom is insured, the insurance company of the at-fault driver is responsible for compensating the victims. This is part of the standard liability coverage that is mandatory in many countries. The extent of compensation and the types of costs covered (medical expenses, property damage, loss of earnings, etc.) depend on the specific terms of the insurance policy.

85.2.2. On a more generic basis, the Ogden Tables are also used in the United Kingdom to calculate the lump sum compensation in personal injury and fatal accident cases. These tables provide a standardised framework to assess how much money a claimant should be awarded for future losses, such as loss of earnings, cost of care, or future medical expenses, considering the time value of money and the claimant's life expectancy. The tables help in determining the present value of future financial losses or needs by applying discount factors

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that consider the probable rate of return on invested lump sum awards and the expected duration of the claimant's life or the period over which the financial loss is anticipated to occur. This allows for a more equitable and consistent approach to compensation in personal injury litigation and settlement negotiations.

85.2.3. **Motor Insurers' Bureau (MIB)**:

a. **Overview:** The MIB compensates victims of negligent uninsured or hit-and-run drivers for personal injuries. It is funded from the premiums of every insured driver and acts as a fund of last resort to ensure that no individual who is injured by an uninsured or untraced driver goes uncompensated.

   To make a personal injury claim for a car accident, you must prove that:

   - The other driver owed you a duty of care.
   - They breached this duty.
   - As a result of this breach, you suffered injuries.

   A time limit is set out by the Limitation Act 1980, and states that in order to claim general or special damages for a personal injury, your claim must be made within three years of your injury.

b. **Coverage:** MIB covers personal injuries and some property damages. Employer's Liability Insurance covers employee injuries or illnesses due to their work.

c. **Benefits**: MIB provides compensation for medical costs, loss of earnings, and other expenses. Employer's Liability offers lump-sum payments for serious injuries and pensions for dependents in fatal cases.

d. **RAF Comparison:**

   - Funding Mechanism:

     - MIB is funded by a levy on all motor insurance companies in the UK. This levy is essentially pooled from the premiums paid by insured drivers, making insured motorists indirectly contributors to the compensation of accidents involving uninsured or untraced drivers.

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- RAF is funded through a levy on fuel, which means every consumer who purchases fuel contributes to the fund, not just vehicle owners or insured drivers. This broader base potentially spreads the cost across a wider segment of the population.

- Fault Basis:

  - To claim from the MIB, the victim must establish that the other party was at fault, similar to RAF's fault-based system. However, MIB's process is specifically tailored to situations involving uninsured or untraced drivers, which can add a layer of complexity to the claim process, particularly in proving the claim in the absence of an identified counterparty.

  - RAF requires the claimant to prove negligence on the part of another driver, which can involve legal processes and potentially lengthy investigations. Both systems, therefore, share the complexity of fault-based claims, but MIB operates within a more narrowly defined scope.

- Operational Focus and Scope:

  - MIB in the UK primarily deals with claims against uninsured and untraced (hit-and-run) drivers. It acts as a mechanism to ensure that victims of such accidents are not left without compensation due to the lack of an identifiable or insured counterparty.

  - RAF has a broader operational focus, covering all road accident victims in South Africa, provided the accident was due to negligence. This includes accidents involving insured, uninsured, and unidentified vehicles.

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85.3. **Germany: Statutory Accident Insurance (Gesetzliche Unfallversicherung):**

a. **Overview**: Covers work-related and commuting accidents for all employees, offering a wide range of benefits with funding being through employer contributions.

b. **Coverage:** Includes medical treatment, rehabilitation, compensation for loss of earnings, and survivor benefits.

Should an occupational accident, commuting accident (i.e. accidents on the way to or from the workplace) or occupational disease occur, the statutory accident insurance provides complete medical, social and vocational rehabilitation for insured members, financial compensation, and if necessary, lifelong care.

c. **Benefits:** Compensation is based on previous income, with loss of earnings benefits reaching up to two-thirds of the annual earnings. Survivor pensions are provided in fatal cases.

d. **RAF Comparison:**

- Employment Relation:

  - Germany's system is specifically designed to cover work-related and commuting accidents, making it more limited in scope compared to RAF, which covers all road accidents, regardless of the context.

  - This focus on employment-related incidents in Germany aligns the compensation closely with employment insurance, differing from RAF's broader mandate to cover road accidents in general.

- Coverage and Benefits:

  - Both systems provide comprehensive benefits, including medical damages and income compensation. However, the German system's linkage to employment might offer more robust reintegration and rehabilitation services through workplace

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mechanisms, a feature that might not be as pronounced in RAF's model.

86. Third-World Countries:

86.1. **Namibia: Motor Vehicle Accident Fund (MVA Fund):**

a. **Overview**: State-run entity providing compensation and support to individuals affected by road accidents, financed through a fuel levy.

b. **Coverage**: Comprehensive coverage for medical and rehabilitation expenses, loss of earnings, and support for dependents in fatalities.

c. **Benefits**: Includes medical treatment, income compensation for temporary or permanent disability, and survivor benefits, including funeral grants and loss of support payments.

It operates on a hybrid system where all people injured in motor vehicle crashes, regardless of who caused the crash, receive fair and reasonable benefits (subject to some limitations and exclusions).

Table 3: Namibia MVA Fund benefits

Benefit	**Detail**	**Compensation (1 N$ = 1 ZAR)**
Medical Benefits	A person involved in a motor vehicle crash is eligible for an undertaking which provides f or medical treatment, injury management, rehabilitation and life enhancement.	Amounting up to N$1 500 000
Injury Grant	The Fund provides an injury grant. This is a cash grant that serves as compensation for injury in respect of any injured person.	To the value of up to N$100 000
Funeral Grant	The Fund provides a funeral benefit in respect of any	To the value of N$7 000

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	person who died in a road crash in Namibia.	
Loss of Earnings	Loss of earnings may be claimed by a survivor of a road crash with certain limitations and exclusions.	Limited to N$ 100 000
Loss of Support	Loss of support may be claimed by a dependant of a deceased and is limited to N$ 100 000, with certain limitations and exclusions.	Limited to N$ 100 000

d. **RAF Comparison:**

- Hybrid Compensation Model:

  - Namibia's MVA Fund operates on a hybrid model, offering compensation regardless of fault, akin to a no-fault system, but with certain limitations and exclusions. This model aims to provide a fair and equitable system while also deterring negligent driving.

  - RAF's approach, predominantly fault-based, requires proving another party's negligence to secure compensation, which can complicate and lengthen the claims process compared to Namibia's more streamlined hybrid approach.

- Funding Sources:

  - The MVA Fund in Namibia is financed through a fuel levy, similar to RAF, ensuring that all motorists contribute to the fund indirectly through fuel purchases.

  - This shared funding mechanism ties both funds closely to the road use and fuel consumption of their respective countries, making them dependent on these economic activities for sustainability.

- Compensation Caps:

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- Namibia's MVA Fund has established caps on certain types of benefits, such as medical benefits and loss of income.

- RAF, by contrast, does not impose explicit caps on the compensation amounts for individual claims. The compensation is determined based on the actual loss and damage suffered by the claimant, subject to the fund's assessment and legal processes. This can lead to significant variability in compensation amounts, reflecting the actual costs and losses incurred by victims.

86.2. **Botswana: Motor Vehicle Accident Fund (MVA Fund)**:

a. **Overview**: Similar to Namibia's Fund, it offers compensation and assistance to road accident victims, funded primarily through a fuel levy.

   It provides for automatic cover of claimants, irrespective of the cause of accident while providing limited cover to negligent parties hence it is referred to as a “hybrid compensation system”.

b. **Coverage**: Covers medical costs, income support, compensation for permanent disabilities, and benefits for dependents of deceased victims.

c. **Benefits**: Provides for, among others, medical care, rehabilitation services, income replacement, and loss of support payments for survivors.

   Any person injured in a road crash within the borders of Botswana is eligible to be covered up to a maximum of P1 000 000 in benefits as defined in the MVA Fund Act of 2007. However, a negligent party’s claim is limited to P300 000 and only to the extent of Medical Treatment and Rehabilitation.

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Table 4: Botswana MVA Fund benefits

Benefit	Detail	Compensation (P)	Compensation (R)
Medical Treatment & Rehabilitation	Claimants who have been injured due to road traffic accidents are eligible for medical assistance.	Up to P300 000	Up to R420 000
Loss of Earnings	• Severely injured claimants who cannot return to employment due to the nature of their injuries are eligible for Loss of Earnings, provided such loss is proven. • You will be paid for the period of your loss only (as proven). • If you have been offered an annual payment schedule, you are required to submit an affidavit confirming that you are still unemployed before disbursement of annual payments.		
Loss of Support	• Affidavits confirming socio-economic status of adult beneficiaries and that minor beneficiaries are still alive should be submitted to the Fund before disbursement of annual payments. • A home visit will be conducted before annual payment can be disbursed. • Spouses must inform the Fund if their marital status changes i.e. if they re-marry.	Up to P300 000 subject to a maximum monthly payment of P6 000	Up to R420 000 subject to a maximum monthly payment of R8 400
Funeral Expenses		Up to P7 500 to assist with funeral costs	Up to R10 500 to assist with funeral costs

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d. **RAF Comparison:**

- Scope of Coverage and Benefits:

  - Botswana's MVA Fund covers a broad range of benefits, including medical care, rehabilitation, income replacement, and loss of support payments, broadly similar to RAF's comprehensive coverage. However, Botswana introduces a cap on benefits for negligent parties, reflecting a hybrid approach to compensation.

  - RAF's system, while comprehensive, does not specifically cap benefits, including based on negligence, which could lead to different compensation dynamics between the two systems, particularly in handling claims involving contributory negligence.

- Claimant Coverage:

  - Both Botswana's MVA Fund and RAF aim to protect all road users, including passengers, pedestrians, and drivers.

  - Botswana's approach to automatic cover for claimants, irrespective of the accident cause, with limited coverage for negligent parties, offers an interesting contrast to RAF's need to establish fault in most cases.

86.3. **Brazil: DPVAT Insurance (Seguro de Danos Pessoais Causados por Veículos Automotores de Via Terrestre):**

a. **Overview**: Danos Pessoais Causados por Veículos Automotores de Via Terrestre (DPVAT) or Personal Injury Caused by Motor Vehicles on Land insurance is a mandatory insurance scheme providing coverage for personal injuries caused by motor vehicles, designed to offer immediate financial support to road accident victims, including drivers, passengers, and pedestrians, irrespective of fault.

b. **Coverage**: DPVAT covers three main areas: death, permanent disability, and medical/hospital expenses due to road accidents, ensuring victims or their families receive compensation without engaging in legal proceedings.

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c. **Benefits**: The scheme provides fixed compensation for death and permanent disability, with a cap on reimbursements for medical and hospital expenses, aimed at covering the immediate financial needs following an accident.

d. **RAF Comparison:**

- Fault Basis:

  - Brazil's DPVAT insurance operates on a no-fault basis, providing coverage for personal injury caused by motor vehicles to all parties involved in an accident, similar to Australia's TAC but unlike RAF's fault-based approach.

  - The no-fault system in Brazil simplifies the claims process, ensuring timely assistance to victims, which contrasts with the potentially lengthy and litigious process under RAF due to the fault determination requirement.

- Range of Benefits:

  - DPVAT offers fixed compensation for death and permanent disability and a cap on medical expenses, aiming for straightforward, immediate financial assistance post-accident.

  - RAF, while also providing for a range of benefits, including medical expenses and income support, may offer broader compensation in certain areas, such as pain and suffering or loss of support, due to its fault-based system allowing for more tailored claims based on the accident's circumstances.

87. This comparative analysis showcases the varied approaches to road accident compensation across countries, highlighting the balance between comprehensive coverage and the evolving schemes, all aimed at improving road safety and providing financial support to accident victims and their families.

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CHAPTER 3 : GENERAL DAMAGES

CURRENT LANDSCAPE

88. Current process:

88.1. The current process is defined by various inputs to the three compensation benefit products.

88.2. Submission of claim is triggered by receipt of all required medical documents in compliance with the internal RAF processes and procedures detailed in the RAF Standard Operating Procedures (SOPs).

88.3. The current process begins with the determination of the seriousness of Road Traffic Injuries (RTIs) using standard coding schemes (the World Health Organisation's International Classification of Diseases and Injuries). Once the level of severity has been established, there is then a need to estimate the General Damages quantum.

88.4. Often the RAF utilises past experience (award in previous cases of similar clinical status) and legal precedents from case law where courts have awarded damages.

88.5. The current process of manually capturing the claimant's medical condition and severity assessment thereof is flawed. Admittedly, it is not uncommon to find discrepant settlement values being awarded to claimants with comparable RTI severity and similar medical categorisations who, from a claimant justice and equitability perspective, should receive the same quantum of compensation benefits.

88.6. A secondary problem is the comparability and contradistinction of serious injuries such as, among others, paraplegia vis-a-vis quadriplegia.

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88.7. A tertiary problem is assessing the individualised impact of the same RTI classification on the different occupational needs and ergonomic requirements of claimants in their respectively varied workplaces. Given the dichotomy of jobs and occupations between those which are skills-based and predominantly reliant upon exercise of motor skills such as playing a guitar or keyboard (much usage of fingers) or soccer (legs) versus those which are cognitive-based such as public speaking (critical thinking), it becomes controversially difficult to assess a hand injury to a pianist vis-a-vis a poet. There is therefore a need to develop evidence-based and scientific models to estimate and derive an award for the claimant without undue prejudice as well as to establish equity, parity, and fairness in the award system.

89. Summary of current injury assessment process:

89.1. The starting point of adjudication or calculation of award is the determination of the seriousness of injury (assessment of injury severity).

89.2. This uses the diagnostic approach which applies the American Medical Association (AMA) or Narrative Test guidelines to determine the category of injury either as serious or non-serious injury.

89.3. A serious injury thus qualifies for General Damages and a non-serious injury would be disqualified for General Damages.

89.4. Further categorisation utilises the ICD 10 codes to classify an injury into the RAF serious injuries list.

89.5. The General Damages for a serious injury require the application of WPI assessment using the AMA guidelines.

89.6. WPI that is greater than the thirty percent (> 30%) minimum threshold qualifies for compensation for future medical care and General Damages.

89.7. WPI less than thirty percent (< 30%) requires medical experts to participate in the resultant assessment using the narrative test.

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89.8. Post the categorisation of the injury, the RAF officer uses he Quantum Yearbook to calculate the quantum of General Damages to award.

89.9. The limitations identified in the Quantum Yearbook result in inaccurate and non-scientific calculations.

89.10. Should the legal representation of the claimant not accept the proposed award, the process would follow the HPCSA tribunal review process.

89.11. The tribunal may concur with the RAF award outcome or reject it altogether.

89.12. The HPCSA Tribunal-reviewed assessments are on average 64% in agreement with the outcome of the RAF.

89.13. The claimant also has the option to pursue the legal route of litigation to challenge the outcome of this process and this currently exposes the RAF significant legal risk.

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90. Injury and coding management process:

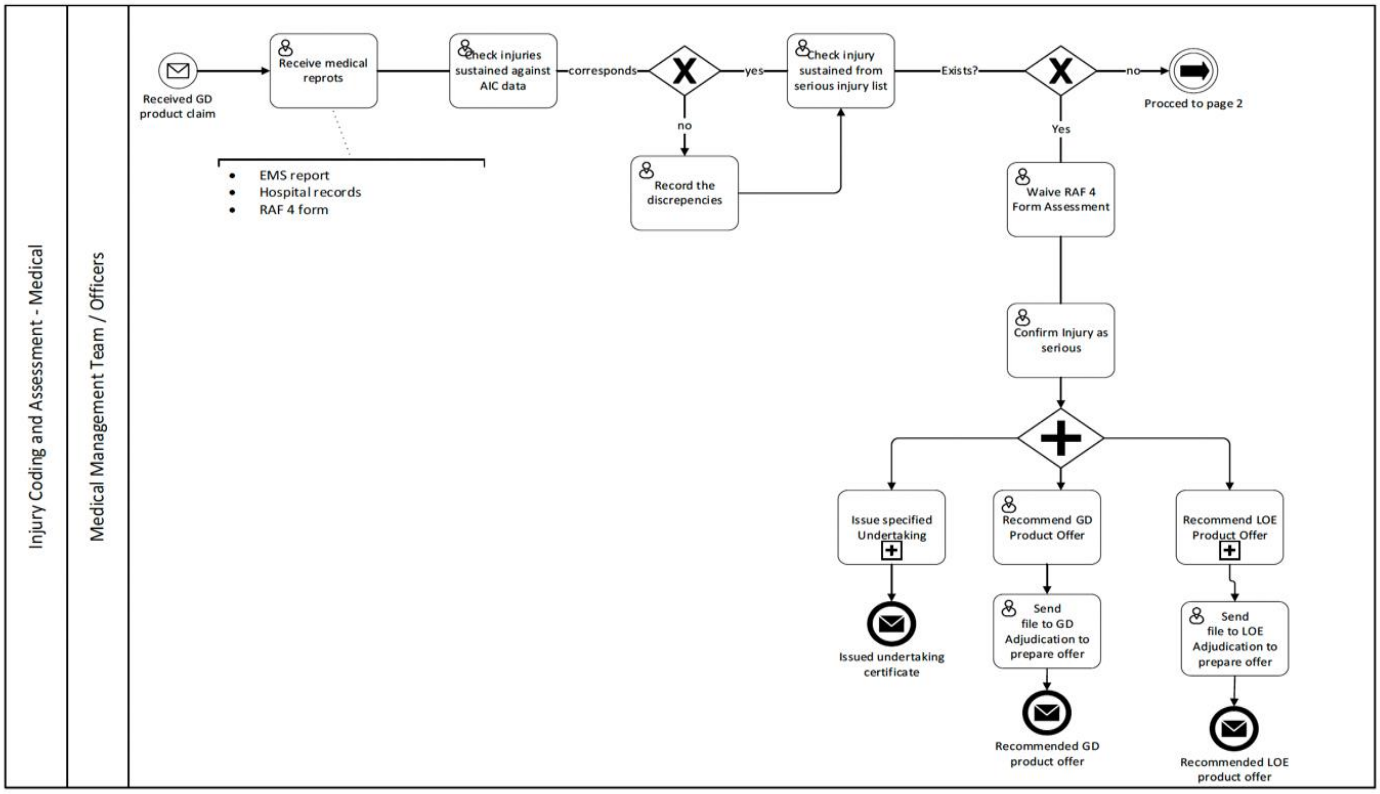

Figure 1: Injury and coding process: part 1

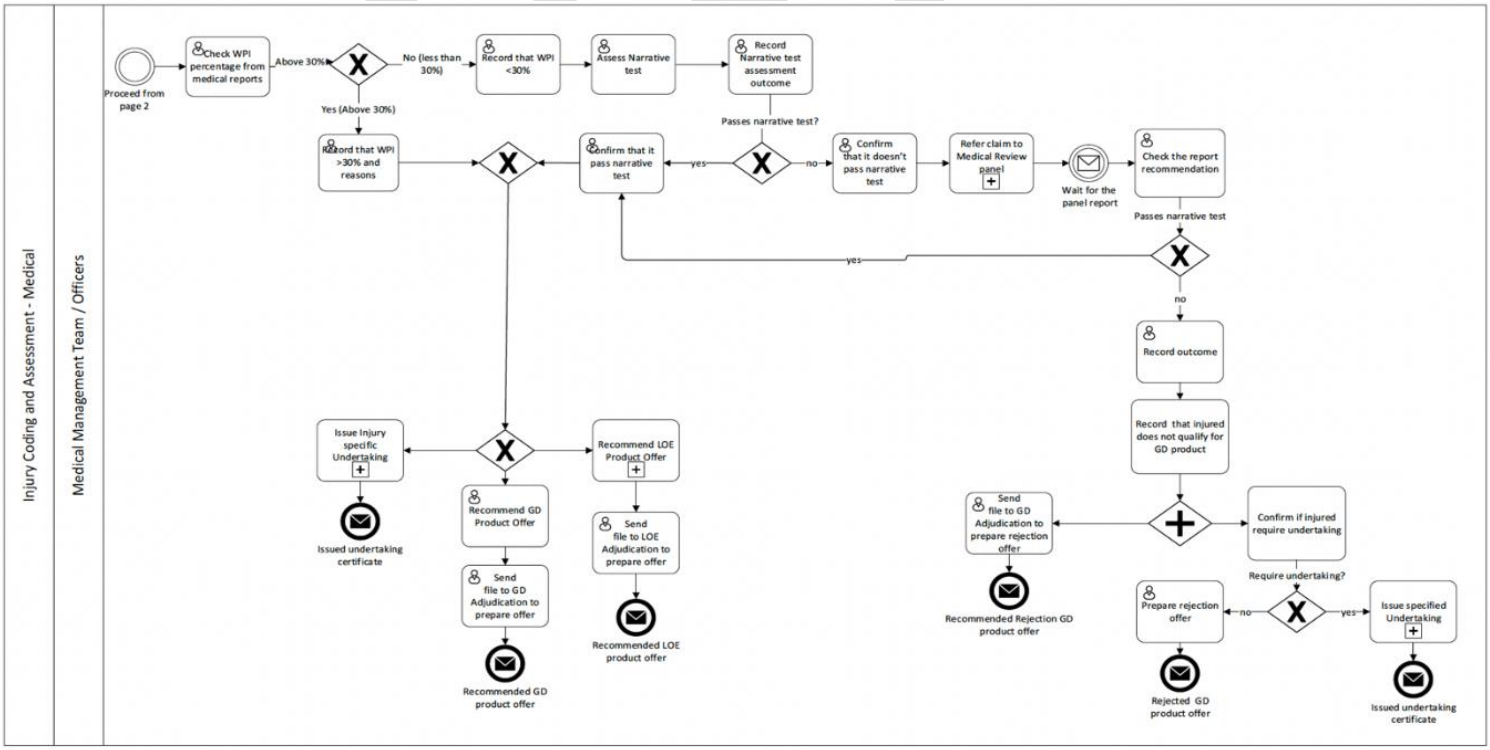

Figure 2: Injury and coding process: part 2

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PROPOSED SOLUTION

90.1. Project overview

a. The current process of formulating a RAF claim is time-consuming, complex, and non-transparent. There are many specialists required to write expert witness reports which are used to eventually justify calculation of the final quantum of the settlement value. The process followed currently involves a lot of judgment by medical, actuarial, industrial psychology and educational psychology experts, among others.

b. The significant application of subjective judgment and personal assessment has led to inequity in computation of settlement value quantum.

c. The Standard Formula is expected to resolve some of the challenges encountered by the RAF with respect to consistent, fair, and transparent calculations for Loss of Earnings, Loss of Support, and General Damages products.

90.2. Project objectives: The overall objectives of the Standard Formulae Project are to:

a. Ensure claimant justice and equity across injured third parties, regardless of who rated their impairment.

b. Speedier payments to third parties because of fewer questions and challenges inherent in a complex assessment and claims adjudication environment.

c. Resolution of injured claimants', assessors, and adjudicators frustrations, which facilitates the speedy resolutions of claims thereby lowering the administrative burden on the users and the RAF.

d. Comparable statistics permitting case comparisons, tracking, and research.

e. Reduced litigation over impairment percentages.

90.3. The solution design:

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a. The currently proposed and supported solution for General Damages is as outlined in this section of the document after extensive consultation and engagement with key stakeholders. The consultative process yielded two solutions whose details are contained in Appendix B. Respective comparisons, risk assessments and Cost-Benefit Analyses (CBAs) of these two solutions were done and the merits and demerits thereof highlighted.

b. RAF's current SI list has its advantages of ease of use and simplicity in application with the potential to develop Straight Through Processing (STP) at some point. However, the SI list fails to comprehensively isolate and distinguish between the serious and non-serious WPIs. It, however, contains injuries that when assessed for the WPI contribution, are mixed with both serious and non-serious according to the current regulatory provisions.

c. The reliance on the AMA Guides on WPIs also has challenges of complexities and inconsistencies of application resulting in falsified reporting and many other potential actions by assessing practitioners.

d. The two stand-alone solutions, however, can be hybridised to synergistically yield the acceptable and more desirable outcomes. Notwithstanding, there is need for proactive risk mitigation plans arising out of the adoption and implementation of the hybrid solution. By adopting this approach, the RAF will realise benefits that align with the strategic position currently under way.

90.4. Inputs and outputs:

a. Inputs

- Internal data from RAF: Claims data for the last few years (e.g., 5 years).

- External data from RAF:

  - If necessary, external data that may be relevant to the model/project.

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- Any documents that may be useful in understanding the Current State at RAF as well as any context with respect to the Standard Formula project.

- Tribunal cases and decisions reached to enable comparison of historical data to assumptions made.

- Range of previous awards for each injury by the categories proposed.

b. Outputs

- **Output 1: Road Accident Injuries Classification Framework**:

  - Develop a standardised classification framework of injuries considered serious.

  - Ensure the framework is:

    i. comprehensive to cater for all body systems,

    ii. inclusive of all serious injuries within each body system that may result from motor vehicle accidents,

    iii. applies ICD-10 codes and Classification, and

    iv. considers poly-trauma and pre-existing conditions.

- **Output 2: Severity Grading System Linked to WPI:**

  - Re-establish an injury severity grading system (ISGS).

  - Anchor the use of the AMA assessment as the regulated tool acceptable to determine rating of seriousness on injury using the Whole Person Impairment (WPI) approach for each injury category.

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- **Output 3: Narrative Test Subjectivity Assessment**

  - Regulatory framework review

    i. Review expectations of the regulatory framework and requirement for the subjective test

    ii. Definition of outliers of WPI assessment due to injury complication or progression and the alternative consideration and objective assessment thereof

  - Expert stakeholder engagement

    i. Engagement with relevant stakeholders to determine relevance of subjective assessment tools in injury assessment, classification and severity grading to ensure alignment with global standards and legal requirements.

  - Developing a regulation 3 (1) (b) (iii) injury list

    i. Develop a list of potential injuries based on the 4 Regulation 3 conditions that will account for all impairments currently covered in the narrative test.

    ii. Add these conditions through a mapping process to the revised SI list.

- **Output 4: Research on Monetary Value of Life for General Damages**

  - Conduct in-depth research on methodologies for assigning monetary values to injuries by considering international best practice while aligning with the context of South Africa[1].

[1] However, it is generally accepted that the Road Accident Fund is the only motor vehicle accident social security scheme globally that offers compensation a for general damages

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- Comparison with previous RAF awards and judgement

- Research and document the historical awards in previous claims and identifying ranges of awards in prior claims processed.

- Establish a calculated amount for Value of Life Amount in Accordance with Road Accident Act:

  i. Review the provisions of the Road Accident Fund Act of South Africa to determine appropriate caps for compensation.

  ii. Establish amounts for each injury by WPI rating and categorise these to link to injury categorisation.

  iii. Ensure that the capped amounts align with the legal framework and provide fair and equitable compensation for victims.

90.5. Revised Serious Injuries List

a. RAF is dedicated to developing a comprehensive list of injuries called the "Revised Serious Injuries List[2]" to ensure uniform application when assigning injury severity. This list will be coded using the AMA Guides methods (see figure below).

b. The serious injuries (SI) list including its development framework must withstand rigorous scrutiny and testing and enable congruence when applying clinical judgment in comparison to the comprehensive and time-consuming process when assessing the injury using the AMA Guides. The undertaking must ensure - accuracy, reliability, and consistency with AMA Guides[3] when designating injury seriousness.

   - By establishing a comprehensive list of serious injuries that consider various medical scenarios including pre-defined serious injuries that are known to result in serious impairment, polytrauma, incomplete recovery due to biological and non-biological factors, pre-existing impairment inter alia, this will aid the RAF in case adjudication and allocating

[2] The injuries included in the Revised Injuries List will be mapped to a codified list the RAF1 ICD-10 codes

[3] The AMA Guides are the current standard for assessing the impact of the serious injury on the third party's residual functional ability as a result of the injury.

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monetary values to establish fairness, equity and transparency of the and the adjudicating process.

- In addition, this will facilitate simplicity and fast-tracking of the claims process and remove unwarranted and complexity for the RAF, claimants and medical professionals including expert assessors.

RATIONALE FOR THE SOLUTION

90.6. RAF regulatory framework

a. The starting point is that in terms of Section 17 of the Road Accident Fund Act, the obligation of the Fund to compensate a third party for non-pecuniary loss such as "pain and suffering and losses of amenities and enjoyment of life", is limited to compensation for a serious injury only. Subsection 1A stipulates that “Assessment of a serious injury shall be based on a prescribed method.”

b. Regulation 3 prescribes the methods of assessment to be applied in determining which injuries qualify for compensation.

- **Regulation 3(1)(b)(ii):**

  - If the injury resulted in 30 per cent or more Whole Person Impairment (WPI) as provided in the AMA Guides, the injury shall be assessed as serious.

- **Regulation 3(1)(b)(iii):**

  - An injury which does not result in 30 per cent or more Impairment of the Whole Person may only be assessed as serious if that injury:

    - resulted in a serious long-term impairment or loss of a body function;

    - constitutes permanent serious disfigurement;

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- resulted in severe long-term mental or severe long-term behavioural disturbance or disorder; or

- resulted in loss of a foetus.

90.7. The RAF Serious Injury List

a. Based on prior research work, the Fund has identified a predetermined schedule of injuries that will always qualify as serious when assessed against the AMA 30% Whole Person Impairment threshold specified in Regulation 3(1)(b)(ii).

b. These injuries have been listed and referenced as the Serious Injury (SI) list and has been pre-determined to agree with Seriousness or a Whole Person Impairment (WPI) of above 30% based on prior consultations with relevant medical experts.

90.8. Based on this understanding, the objective to standardise the calculation of the award for General Damages requires the following refinements:

a. Injury Severity Classification:

- The International Classification of Diseases and Related Health Problems (ICD) is the main classification system used for population-based injury surveillance activities but does not contain information on injury severity. ICD-based injury severity measures can be empirically derived or mapped, but no single approach has been formally recommended anywhere in the medical community.

  - To address this gap, researchers and healthcare professionals have developed various approaches to derive or map injury severity measures using ICD codes. These approaches can range from simple algorithms based on diagnosis codes to more complex methods involving injury-specific scoring systems or machine learning algorithms.

  - It is thus clear that ICD coding alone cannot be adequately relied upon by the Road Accident Fund to assess injury severity as it

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attempts to quantify the extent of the injury (whole person impairment) to the third party and assign some form of meaningful of proportional compensation[4] under General Damages.

b. Impairment due to Polytrauma or Multiple Injuries:

- In clinical practice, severity of trauma is related not just to the severity of individual injuries, but also to the combined effects of multiple injuries. This scenario is prevalent in the RAF environment since most motor vehicle accidents that result in significant impairment are of high velocity in nature. The clinical coding practice of identifying a single primary diagnosis and secondary diagnoses allows for ease of classification. In clinical practice, multiple injuries (polytrauma)[5] are typically graded using the Injury Severity Score (ISS), which is an empirical system based on the Abbreviated Injury Scale (AIS) grades for the three worst body regions.

- AIS divides the body into six regions: head and neck, face, thorax, abdomen, pelvis, and extremities, and external.

- The AIS was specifically designed for motor vehicle injuries but has been validated for blunt and penetrating trauma. Its usefulness has been demonstrated in other areas including research, education, audit, and most importantly for this exercise - **allocation of resources.**

- Specific injuries in each body region are coded on a scale of 1 (**minor**), 2 (**moderate**), 3 (**serious, not life threatening**), 4 (**severe, life threatening, survival probable**), 5 (**critical, survival uncertain**) and 6 (**unsurvivable**).

  The challenge is amplified when one attempts to assess injury severity when the discreet ICD10 codes do not adequately cater for the

[4] In this context, by 'proportional compensation' we imply a situation where based on the severity of the injury suffered by the third party and the resultant impact it has on his or her life (impairment), the GD monetary compensation (the award) is directly linked to the extent of impairment (impact of injury) on the third party's life.

[5] Ching-Hua et al. In the acute phase, consensus seems to be the AIS/ISS does not reflect the physiological course after injury, which can be very dynamic in nature and may profoundly influence outcomes. Therefore, the definition of polytrauma by the number of injured body regions would make it difficult to be distinguished from the concept of "multiple trauma". To improve the specificity of the polytrauma definition, some additional qualifying criteria. A combination of injury severity, relevant pathophysiologic change, or physiologic changes in the clinical condition is useful.

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multidimensional nature of polytrauma especially for non-contiguous and multi-system injuries which have an overall impairment impact at a whole person level[6,7,8.]

- A further sharpening of the definition for polytrauma as it relates to the classification of injury severity for the RAF including a linkage to the anticipated long-term multidimensional functional consequences of severe multiple injuries after trauma is important to determine a validated severity modifier for polytrauma.

c. Rationalise the AMA Guides as a singular tool for Assessing Impairment:

- The current gold-standard for assessing impairment is the AMA Guides which is also recognised in the RAF Act and Regulations and is included in RAF 4 Form.

  The Guides are considered generally helpful in enabling a standardised model and aim to solidify impairment ratings; however, accuracy of application and consistency continue to remain an issue. Significant variation using the Guides has been reported with some persons receiving more than one rating of impairment for the same condition[9.]

- Common critiques of the AMA Guides 6th edition are that they are too complex, are sometimes lacking in evidence-based methods, and rarely yield consistent ratings. Many international jurisdictions and institutions mandate use of the AMA Guides, but few are adopting the current edition due to the increasing difficulty and frustration with their implementation.

[6] Lyons RA, et al. Measuring the population burden of injuries--implications for global and national estimates: a multi-centre prospective UK longitudinal study. PloS Medicine. 2011; 8(12):e1001140. doi: 10.1371/journal.pmed.1001140
[7] Haider AH, et al. Influence of the National Trauma Data Bank on the study of trauma outcomes: is it time to set research best practices to further enhance its impact? Journal of the American College of Surgeons. 2012; 214(5):756-768. doi: 10.1016/j.jamcollsurg.2012.01.050.
[8] Ministry of Health and Long-Term Care. Ontario Trauma Registry 2017–2018 Report on Injury and Trauma in Ontario. 2018. Available online: https://www.traumacentre.on.ca/docman/volume-1-issue-2-july-2019/193-otr-2017-2018-report-on-injury-and-trauma-in-ontario/file .
[9] Return to work patterns for permanently impaired workers. Texas Monitor. 1996;1:7 & ette AM, Haley SM, Tao W, Ni P, Moed R. Prospective evaluation of the AM-PAC-CAT in outpatient rehabilitation settings. Phys Ther. 2007;87(4):385-398. doi:10.2522/ptj.20060056.
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- **Complexity**: The AMA Guides are known for their complexity, with intricate algorithms and criteria for assessing impairment across various body systems. This complexity can make it challenging for healthcare providers to consistently apply the guidelines, leading to variability in ratings[10].

- **Lack of evidence-based methods**: Critics argue that some aspects of the AMA Guides lack robust evidence-based support. This can undermine the reliability and validity of impairment ratings, particularly when assessing conditions or injuries where the evidence base is limited or evolving[11].

- **Inconsistency**: Due to the complexity of the guidelines and subjective interpretation of criteria, impairment ratings often vary between different evaluators. This inconsistency can lead to disputes and challenges in legal and insurance contexts.

- **Difficulty in implementation**: As previously noted, the increasing difficulty in implementing the AMA Guides 6th edition has led to frustration among stakeholders. This difficulty may stem from both the complexity of the guidelines themselves and challenges in applying them consistently and accurately[12].

- **Difficulty in interpretation**: The Guides have also become more and more complex, and increasingly difficult to interpret and apply in practice. The 5th and 6th edition of the Guides include impairments for pain and psychological effects of injuries. These have been found to be extremely hard to assess with any sort of

[10] Harris IA, et al. Association between compensation status and outcome after surgery: a meta-analysis. JAMA. 2005;293(13):1644-1652. doi:10.1001/jama.293.13.1644.

[11] Bhandari M, Swiontkowski M. Management of acute hip fracture. N Engl J Med. 2017;377(21):2053-2062. doi:10.1056/NEJMcp1611090. &
MacKenzie EJ, Shapiro S, Eastham JN. The nature of traumatic brain injury in the United States. In: Narayan RK, Wilberger JE Jr, Povlishock JT, eds. Neurotrauma. McGraw-Hill; 1996:3-18.

[12] Gopinath B, Jagnoor J, Harris IA, Nicholas M, Casey P, Blyth F, Maher CG, Cameron ID. Prognostic indicators of social outcomes in persons who sustained an injury in a road traffic crash. Injury. 2015;46(5):909-917. doi:10.1016/j.injury.2014.12.009. &
Carroll LJ, Holm LW, Hogg-Johnson S, et al. Course and prognostic factors for neck pain in whiplash-associated disorders (WAD): results of the Bone and Joint Decade 2000-2010 Task Force on Neck Pain and Its Associated Disorders. Spine (Phila Pa 1976). 2008;33(4 Suppl):S83-S92. doi:10.1097/BRS.0b013e3181643eb8.
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consistency, and issues continually arise in relation to relative pain and the validity of qualitative claims[13].

- **Poor documentation by practitioners**: Poor documentation is generally widespread, even with AMA certified practitioners, most notably incomplete and inaccurate entries are widespread.

- A clearer, simpler approach is needed. Those injuries which are determined to result in a permanent impairment qualify for an "impairment rating" using the WPI scales (i.e., a serious injury is one that results in Whole Person Impairment of ≥ 30%), upon which the General Damages monetary values are determined for each case.

- The RAF seeks to ensure that the consistent objectification of a physical loss linked to General Damages must be “impairment” rather than “disability”. Disability and its consequences are considered to be adequately addressed in the Past and Future Medical Expenses which seeks to provide comprehensive medical assistance in order to ensure adequate provisions and medical adjustments are provided for the third party.

[13] Brigham C. Impairment Resource Discussions. https://www.impairment.com/ama-guides/
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91. **Standardisation Framework Outline**

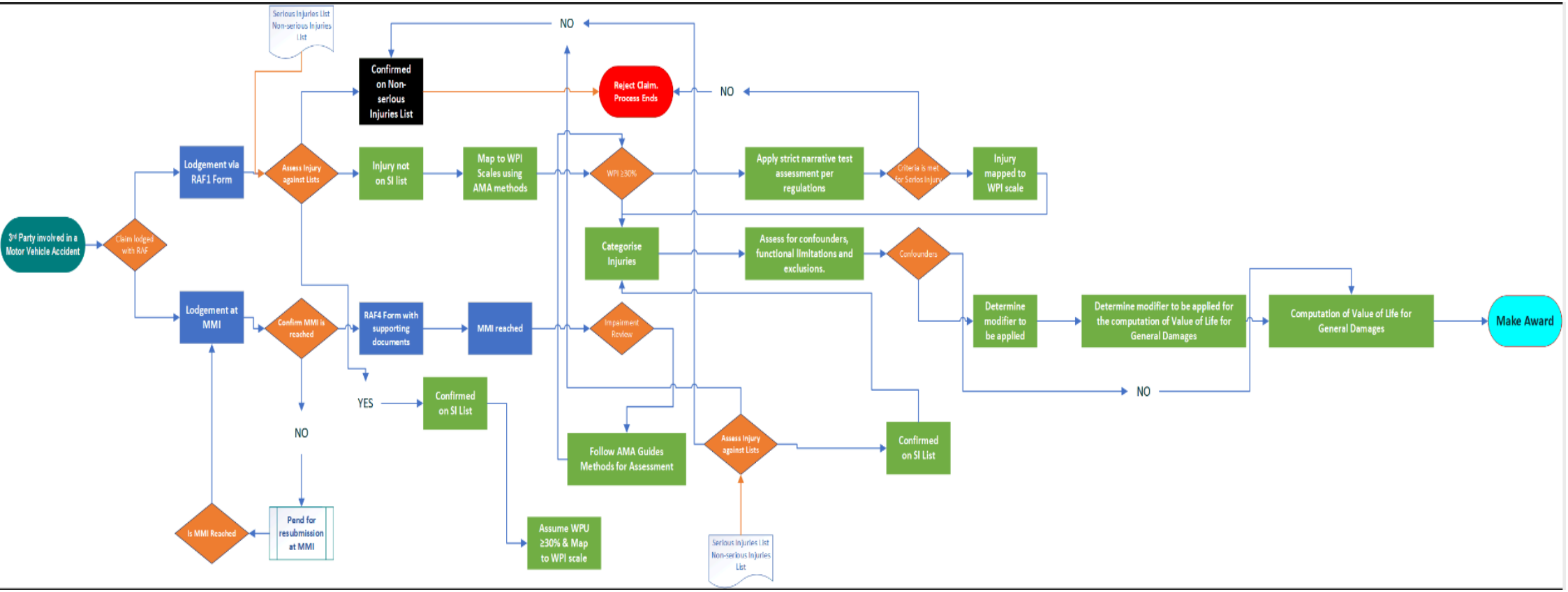

Figure 3: Schematic for the Standardisation Framework illustrating the Solution for GDs

DETAIL OF SOLUTION

91.1. Goal 1: A mapping of all SI listed injuries to a WPI in a standardised manner:

a. Adopt the current RAF Serious Injuries (SI) list in its current form and incorporate this as an accepted baseline standard to create a starting point for the assignment of the seriousness status of injuries.

b. Undertake a mapping[14] of the SI list and Addendum List Injuries to a WPI scale whereby those injuries would compute a WPI ≥ 30% (Work-in-Progress).

c. This is critical to enable the Revised Injuries List credibility for gazetting. In the alternative, should there be a significant lack of internal consistency, this finding may support the repudiation of the AMA Guides as a tool for assessing impairment.

d. There are important considerations to consider in mapping the SI list:

- **Conflating impairment with disability:**

  - Measures of impairment are fundamentally different from measures of disability. Two persons with identical injuries will have the same impairment score but may be assessed at drastically different levels of disability. For example, a professional piano player and an administrator may each lose their fifth digit (little finger). Their impairment rating could be identical; however, the professional piano player will be left with a significant impact on their earning capacity, while the administrator will probably see a minimal effect in their work performance. Impairment compensation relates solely to the effect of the injury on the body, while disability compensation includes the injury's specific effect on employment, social and recreational performance.

[14] Due to the complex nature of Goal 3, this particular deliverable may, in agreement with the RAF, be deferred for Phase 2.

- Currently there are significant disparities of impairment ratings and post injury settlements raising fundamental questions about social justice with the assessment determination processes.

- **Impairment[15]:**

  - Impairment refers to any loss or abnormality of psychological, physiological, or anatomical structure or function. It is a medical term used to describe the physical or mental limitations resulting from injury, illness, or congenital conditions.

  - Impairment is typically assessed by healthcare professionals through clinical examination, diagnostic tests, and medical history review.

  - Examples of impairment include loss of limb function, reduced range of motion in a joint, cognitive deficits, or sensory impairments.

- **Disability[16]:**

  - Disability, on the other hand, refers to the limitation or restriction of activity or participation in society resulting from impairment. It encompasses the broader impact of impairment on an individual's ability to perform daily tasks, engage in work, participate in social activities, and fulfil roles within their community.

  - Disability is influenced not only by the severity of impairment but also by environmental factors, societal attitudes, and individual coping strategies.

[15] American Medical Association. Guides to the Evaluation of Permanent Impairment. 6th ed. American Medical Association; 2008.
World Health Organization. International Classification of Functioning, Disability and Health (ICF). World Health Organization; 2001. Available at: https://www.who.int/standards/classifications/international-classification-of-functioning-disability-and-health.
[16] World Health Organization. International Classification of Functioning, Disability and Health (ICF). World Health Organization; 2001. Available at: https://www.who.int/standards/classifications/international-classification-of-functioning-disability-and-health.
Institute of Medicine (US) Committee on Disability in America. The Future of Disability in America. National Academies Press; 2007. doi: 10.17226/11898.
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- Disability is often assessed through functional evaluations, such as assessing an individual's ability to perform specific tasks or activities of daily living.

- Disability can be temporary or permanent, partial or total, and may vary in severity over time.

91.2. Establish evidence-based guidance on injury specific timelines from date of injury to expected time of MMI for the Revised Serious Injuries List.

a. This will be used as a tool to inform presumptuous assignment of WPI when the injury cannot be considered to have reached MMI, this is particularly relevant for disputed case and other cases where the assessor prefers the use of the AMA Guides as a reference point to establish level of impairment.

b. Secondarily, this may be used as a guide to inform claim prescription, e.g., if the claim must prescribe at 5 years since date of injury, the system driven MMI date linked to the type of injury can be used as a basis for condoning a late claim or justifying lack of condonation if MMI has long been reached. This will provide:

   - Establish evidence based rehabilitative periods or timeline for MMI linked to accepted medical guidance to healing and rehabilitative period by system.

   - Establish that the third party has indeed reached MMI.

   - Based on researched rehabilitative periods a MMI of 12 months as indicated in RAF 4 is within acceptable norms

c. Injury Transitioning:

   - A process of transitioning the common initial clinical presentation list to functional limitations, where the limitations can either be physiological or anatomical, is thus acceptable or desirable.

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- This is to ensure that the conditions in the CICP list are mapped to functional limitations.

- Further mapping will allow the clinical progression to be monitored for congruency, implying the following:

d. No minor common initial clinical presentation may progress to a severe form without the listing of diagnosed and codified complications;

e. Such complications can be monitored and documented under the RAF case management protocols to prevent scamming the scheme or listing of unrelated injuries as part of the RAF 4 process; [OBJ]

f. Impairment Assessment and Maximal Medical Improvement (MMI):

- Impairment ratings are typically performed after the third party attains "maximum medical improvement", a point at which medical recovery from the injury has reached a plateau with no foreseeable significant improvement expected in the person's future (see ***Figure 4*** and ***Figure 5*****)** notwithstanding appropriate medical care.

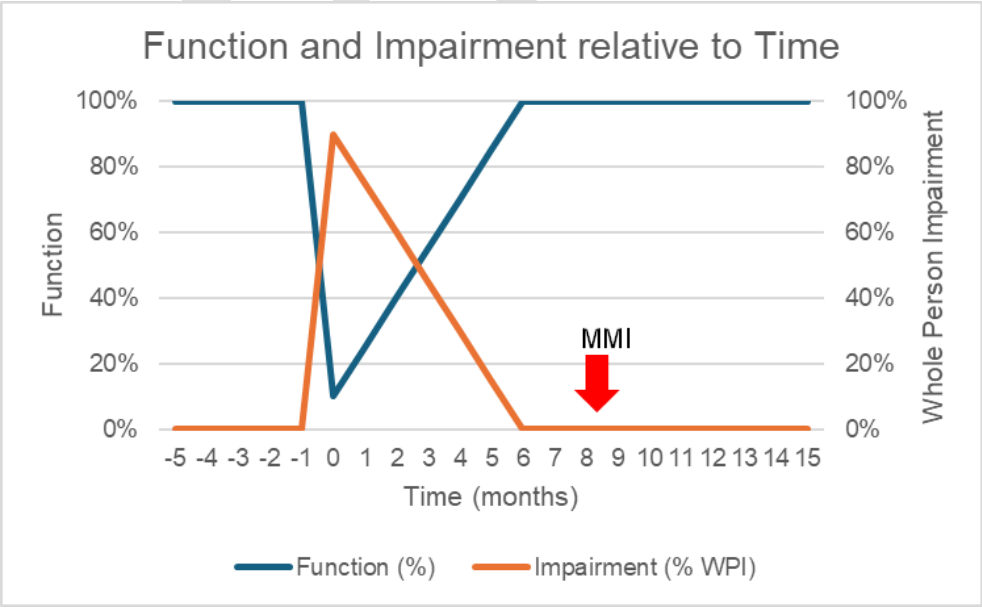

Figure 4: Recovery graph illustrating "no impairment at MMI[17]**"**.

[17] This figure demonstrates injury recovery for an individual who shows no signs of impairment. An injured individual may show impairment at the time of the injury, but after a recovery period may show no signs of impairment.
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- The point at which the persons start to plateau after which no further “significant” improvement is expected is referred to as the point where MMI has been reached. This does not necessarily mean that the individual has fully recovered or that they are back to their pre-injury state; rather, it indicates that their condition has stabilised.

- MMI is typically determined by a medical practitioner based on clinical evaluation, diagnostic tests, and medical records. The practitioner assesses the individual's medical condition, functional limitations, and prognosis to determine if further medical treatment is likely to result in meaningful improvement.

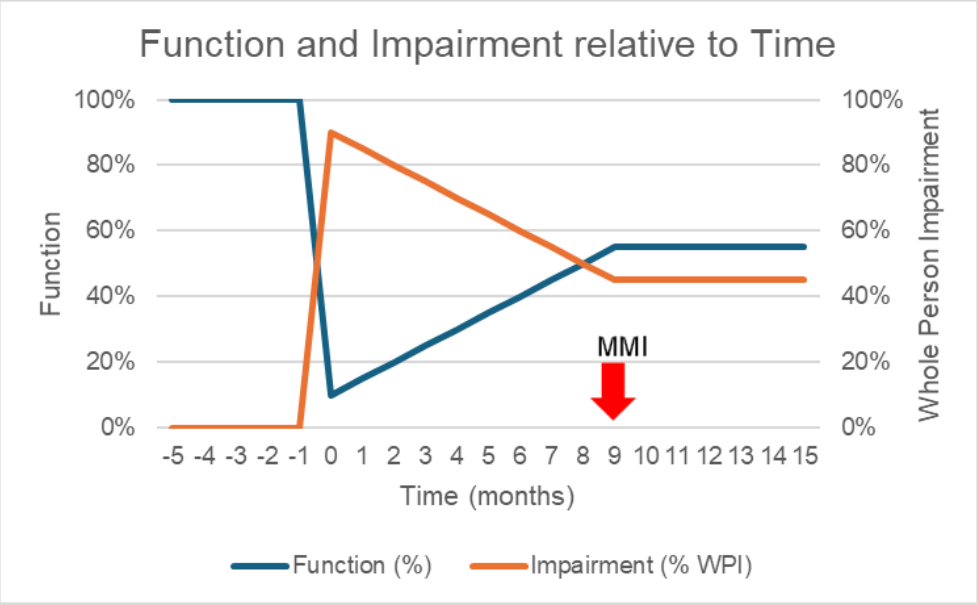

Figure 5: Recovery graph illustrating "45% whole person impairment at MMI

Table 5: Sample of Average Rehabilitative Period

Body System	Average Rehabilitative Period till MMI	Source of reference
Injuries to the Upper Limb	6 weeks to several months, depending on severity	TBA
Injuries to the Lower Limb	6 weeks to several months, depending on severity	S. Poiraudeau, F. Rannou et al.[18]

[18] S. Poiraudeau, F. Rannou, M. Revel. Functional restoration programs for low back pain: a systematic review. Annales de Réadaptation et de Médecine Physique, Volume 50, Issue 6, 2007, Pages 425-429, ISSN 0168-6054, https://doi.org/10.1016/j.annrmp.2007.04.009. (https://www.sciencedirect.com/science/article/pii/S0168605407001237)

		Bendix T, Bendix AF et al.[19]
Injuries to the Thorax	Weeks to months for respiratory rehabilitation, particularly after severe lung injuries or surgeries.	TBA
Injuries to the Abdomen and Pelvis	6 weeks to several months, depending on severity	TBA
Injuries to the Head and Face	Rehabilitation periods vary weeks - months.	TBA
Injuries to the Spine	Highly variable, from a few weeks for minor nerve injuries to several years for complex neurological rehabilitation after spinal cord injuries or traumatic brain injuries.	TBA
Mental Health Disorders classified as Serious Injuries	Highly variable, especially in cases of post-traumatic stress disorder (PTSD) or emotional trauma. Psychosocial rehabilitation may involve therapy and support over an extended period.	TBA
Integumentary System (Skin)	Weeks to months for wound healing and scar management. Extensive burn injuries may require longer-term rehabilitation.	TBA

g. A mapping of any additional injuries above 30% WPI that are currently excluded in the SI list is also being undertaken. An extract of this is indicated in the table below.

h. This process will create the Revised SI List.

[19] Functional restoration in chronic low back pain. T. Bendix, A. F. Bendix, E. Busch, A. Jordan, Tom Bendix MD. First published: April 1996. https://doi.org/10.1111/j.1600-0838.1996.tb00076.x

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Table 6: Sample of the Serious Injury Mapping Process

Coded number	Main Categories	WPI Upper Range
1	Injuries to the Upper Limb:	
1.1	Fracture of shoulder and upper arm:	
S42.21	Fracture of upper end of humerus	Complicated, unstable, or infected
S42.81	Fracture of other parts of shoulder and upper arm	28% WPI if completely dysfunctional
1.2	Injury of nerves at shoulder and upper arm level:	
S44.0	Injury of ulnar nerve at upper arm level	Entrapments differ from total transaction
S44.1	Injury of median nerve at upper arm level	Entrapments differ from total transaction, Pure Median = 27%
S44.2	Injury of radial nerve at upper arm level	Entrapments differ from total transaction
S44.3	Injury of axillary nerve	21%WPI Max
S44.4	Injury of musculocutaneous nerve	25UEI% and 15%WPI MA
S44.7	Injury of multiple nerves at shoulder and upper arm level	Brachial Plexus maximum 100%UEI = 60% WPI but can be as little as 1%
1.3	Injury of blood vessels at shoulder and upper arm level:	
S45.0	Injury of axillary artery	Acute Only Condition and MMI different. Function?
S45.1	Injury of brachial artery	Acute Only Condition and MMI different. Function?
S45.7	Injury of multiple blood vessels at shoulder and upper arm level	Acute Only Condition and MMI different. Function?
1.4	Injury of muscle and tendon at shoulder and upper arm level:	
S46.7	Injury of multiple muscles and tendons at shoulder and upper arm level	ROM may not exceed the Above in Row 7
1.5	Crushing injury of shoulder and upper arm:	

S47	Crushing injury of shoulder and upper arm	ROM may not exceed the Above in Row 7, however consider each regional function
1.6	Traumatic amputation of shoulder and upper arm:	
S48.0	Traumatic amputation at shoulder joint	60% WPI
S48.1	Traumatic amputation at level between shoulder and elbow	>30 % %
S48.9	Traumatic amputation of shoulder and upper arm, level unspecified	30 - 60% WPI
1.7	Injury of nerves at forearm level:	
S54.0	Injury of ulnar nerve at forearm level	Max 35 UEI <20 WPI
S54.1	Injury of median nerve at forearm level	Max 45UEI Max 27WPI
S54.2	Injury of radial nerve at forearm level	21 % Max
S54.7	Injury of multiple nerves at forearm level	Combinations may exist. Each assessed individually
1.8	Injury of blood vessels at forearm level	
S55.0	Injury of ulnar artery at forearm level	PVD Max 39%WPI, can be as low as 0% in isolation
S55.1	Injury of radial artery at forearm level	PVD Max 39%WPI, can be as low as 0% in isolation
S55.7	Injury of multiple blood vessels at forearm level	PVD Max 39%WPI, can be as low as 0% in isolation

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i. Add an Addendum (next phase of the solution) that lists potential injuries that were accounted for by the Narrative Test based on Regulation 3(1)(b)(iii);

- The legislation for assessment of injuries allows a subjective assessment where the injury is 1) not listed on the "non serious injuries" list, and 2) where the injury is considered to have resulted in less than 30 per cent of WPI. In this case the medical practitioner should apply the "narrative test".

  - The solution will develop an additional list researched and based on historical claims data to account for injuries with Whole Person Impairment (WPI) less than 30% that would meet the threshold if accompanied by a condition on the current “narrative test list”[20] OBJ.

  - This will become an addendum to the SI list that represents all possible Narrative Injuries.

  - Should the Revised SI List to WPI mapping process not yield the expected outcome[21], injuries on the revised list will be mapped against a sample of previously adjudicated cases.

- Under the Solution, the Narrative Test shall be interpreted in line with descriptions as contained in the AMA Guides, however the subjective interpretation shall be set aside.

- There may be a need to refer to this provision as Clinical Conditions of Significance and shall be listed as follows:

  - Epilepsy not in the range of 30% and above at WPI,

[20] Regulation 3(1)(b)(iii):

An injury which does not result in 30 per cent or more Impairment of the Whole Person may only be assessed as serious if that injury:

(aa) resulted in a serious long-term impairment or loss of a body function;
(bb) constitutes permanent serious disfigurement;
(cc) resulted in severe long-term mental or severe long-term behavioural disturbance or disorder; or
(dd) resulted in loss of a foetus.

[21] The expected outcome is that a specified injury should yield the same level of impairment (i.e., same WPI percentage) across different subjects.

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- Serious disfigurement covering more than 50% of the face,

- Mental and behavioural impairment of 30% WPI and above (in line with other social security benefits (i.e. COID),

- Loss of a Foetus.

- Because there are reasons to question the application of the narrative test based on observations in reviews of its use, Slabbert and Edeling[23] make various arguments on the weaknesses of the application of the narrative test where "the need for the narrative test arises particularly under two groups of circumstances; namely when the nature of the impairment cannot be dealt with adequately by the methodology of the AMA Guides, and when the circumstances of the injured result in serious disability even though the impairment taken in isolation may not have been seen as serious", …providing "a safety net providing an alternative assessment where the AMA Guides would not result in a finding of serious injury according to the prescription of the Regulations".

- In the context of impairment being a test essentially for activities of "daily living, which includes basic activities such as grooming, toileting, feeding, dressing and bathing, as well as advanced activities such as driving a car, sexual function, money management, shopping, housework and moderate activities", they recommend that "a person should be tested not only against activities of daily living when using the narrative test, but also according to the roles he or she plays in life".

- Based on this, an alternative consideration should the research of historical findings not yield a defensible addendum list of narrative test injuries, RAF recommends:

  - Structured Objective Guideline for Application of Narrative that would be informed by the International Classification of Functioning, Disability and Health (ICF)

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i. Classification of health and health-related domains as the functioning and disability of an individual occurs in a context

ii. WHO framework for measuring health and disability

iii. ICF enables documentation at a higher level of detail.

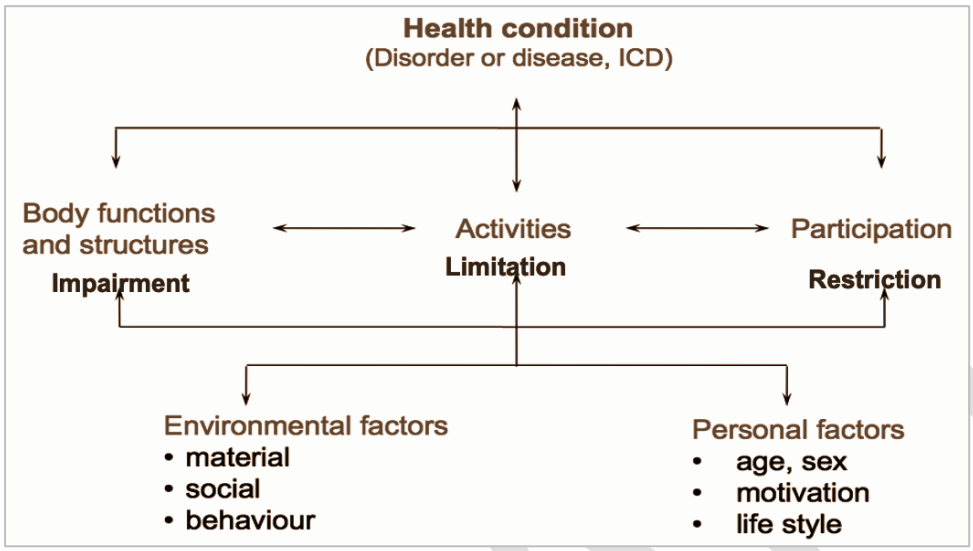

Figure 6: The ICF Model: Interaction between ICF components

- Application of the model

i. patient functional history assessed for basic ADLs

ii. self-reporting functional assessment tools report

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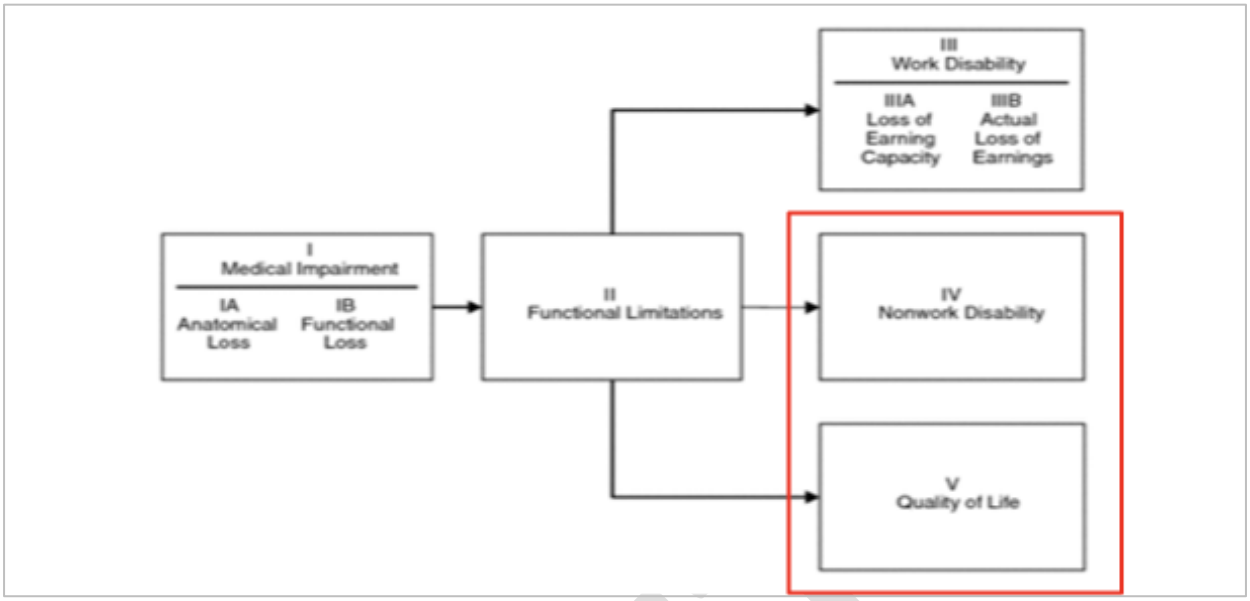

Figure 7: Self-reported functional assessment component.

- Expert Stakeholder Engagement

  - Engagement and Opinion piece of relevant stakeholders to determine relevance of subjective assessment tools in injury assessment, classification and severity grading to ensure alignment with global standards and legal requirements.

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Table 7: Sample impairment functional classification

Sample impairment functional classification

Grade	Slabbert and Edeling[22]	Functional Class Functioning and disability associated with these health conditions	ICF codes and functional levels[23]
0	Normal – 0 percent	No symptoms with strenuous activity (independent)	No problem: The person has no problem at any time or only very infrequently.
1	Class 1 - Mild abnormalities – 1 percent to 10 percent - defined as "Alteration in MSCHIF but patient is able to assume all usual roles and perform ADLs"	Symptoms with strenuous activity; no Symptoms with normal activity Symptoms with normal activity (independent) (independent)	Mild problem: The problem is present less than 25% of the time, with a tolerable intensity, and has only rarely occurred in the last thirty days.
2	Class 2 - Moderate abnormalities – 11 percent to 20 percent - defined as "Alteration in MSCHIF that interferes with ability to assume some normal roles or perform ADLs	Symptoms with normal activity (independent)	Moderate problem: The problem is present between 25% and 50% of the time, with an intensity that sometimes interferes with daily life.
3	Class 3 - Severe abnormalities – 21 percent to 35 percent - defined as "Alteration in MSCHIF that significantly interferes with ability to assume normal roles or perform ADLs	Symptoms with minimal activity (partially dependent)	Severe problem: The problem is present between 50% and 95% of the time, with an intensity that occurs frequently and partially alters daily life.
4	Class 4 - Most profound abnormalities – 36 percent to 50 percent - defined as "Alteration in MSCHIF that prohibits performance of normal roles or performance of ADLs	Symptoms at rest (totally dependent) (totally dependent)	Complete problem: The problem is present more than 95% of the time, with an intensity that totally alters daily life.

[22] Slabbert, M., & Edeling, H. J. (2017). The Road Accident Fund and serious injuries: the narrative test. *Potchefstroom Electronic Law Journal*, *15*(2), 267–290. https://doi.org/10.17159/1727-3781/2012/v15i2a2488

[23] ICF is WHO's framework for health and disability. ICF classifies functioning and disability associated with health conditions. It is the conceptual basis for the definition, measurement and policy formulations for health and disability. It is a universal classification of disability and health for use in health and health related sectors.

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j. Determine a methodology for Confounders and develop Modifiers to account for them.

- In conducting literature research, a list of confounders or variables that need to be factored in establishing the percent WPI at MMI have been established as:

  - Polytrauma
  - Age
  - Pre-existing Medical Conditions (comorbid medical conditions)
  - Pre-existing Impairment
  - Negligent Medical Care.

k. Polytrauma Confounders

- As noted above, polytrauma is clinically defined as the simultaneous occurrence of severe injuries involving multiple body regions, with the severity of each injury assessed using the Abbreviated Injury Scale (AIS). Specifically, polytrauma is universally accepted to be defined[24] "as cases with an Abbreviated Injury Scale (AIS) $\geq$ 3 for two or more different body regions and one or more additional variables from five physiologic parameters (hypotension [systolic blood pressure $\leq$ 90 mmHg], unconsciousness [Glasgow Coma Scale score $\leq$ 8], acidosis [base excess $\leq$ −6.0], coagulopathy [partial thromboplastin time $\geq$ 40 s or international normalised ratio $\geq$ 1.4], and age [$\geq$70 years]).

[24] Butcher N, Balogh ZJ. The definition of polytrauma: the need for international consensus. Injury. 2009 Nov;40 Suppl 4:S12-22. doi: 10.1016/j.injury.2009.10.032. PMID: 19895948.

- This definition has been validated in high-income countries and has application in resource-limited settings such as South Africa[25] for polytrauma patients in the acute setting as well.

- Although this is an acute stage definition, it provides a consistent and repeatable clinical diagnostic criterion to apply as a confirmation of polytrauma.

- The AIS coding system categorises and code injuries by body region (anatomical location) and severity with a simplified numerical code from 1 to 6, where 1 represents a minor injury and 6 represents a maximal injury with unsurvivable outcome.

- The application of a consistent diagnostic criteria becomes important to identify claimants for whom it can be expected that the long-term multidimensional functional consequences of severe multiple injuries after trauma (polytrauma) would validate the use of a modifier to account for their expected worse outcomes in comparison to the single trauma claimant.

l. Polytrauma impact on long term functional assessment

  - Trauma related injuries are a main cause for long-lasting morbidity and disability especially in younger patients with their productive years ahead. This statement does not seek to encroach on the benefit area that is defined and awarded for by LoE but to expand on how a modifier can be used to account for the long term worser outcomes for claimants with polytrauma.

[25] Milton M, Engelbrecht A, Geyser M. Predicting mortality in trauma patients - A retrospective comparison of the performance of six scoring systems applied to polytrauma patients from the emergency centre of a South African central hospital. Afr J Emerg Med. 2021 Dec;11(4):453-458. doi: 10.1016/j.afjem.2021.09.001. Epub 2021 Oct 28. PMID: 34765431; PMCID: PMC8567159.
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m. Age Confounders[26]

- Treatment of confounders will be considered at this stage as follows:

- Age and its impact on the functional limitations as demonstrated by the examples below-

  - A pre-ossified bone structure, may heal entirely by the time ossification occurs, leading to minimal functional limitations,

  - A gynaecological (urogenital) injury may have occurred in a postmenopausal woman with no childbearing potential, implying less functional limitations for such a claimant,

  - A male person of an age above 60 may also be a subject of minimal urogenital limitations.

n. Correction for Pre-Existing Impairment and Underlying Medical Conditions

- Epilepsy and its impact on functional limitations,

  - Whilst the WPI derived from epilepsy as a solitary remnant of the injury may not reach 30% of WPI, the regulatory framework in the South African context precludes the claimant from gainful employment in certain sectors of the economy. The claimant who is of working age, may be deferred to the loss of likely earnings, however the pre-employable claimant may need to be considered under the general damages.

- Regulatory restrictions and systems regulated elsewhere,

  - The SA Regulations on Hearing Impairment has a deviation from AMA Guides due to the 4KHz frequency being the distinguishing

[26] Confounding may occur when the effects of a confounder are not controlled for or accounted for in the analysis. This can lead to a spurious association between the independent (injury) and dependent variables (functional limitation), making it appear as though there is a direct relationship when, in fact, the relationship is due to the confounder.
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element of NIHL from traumatic hearing impairment. This is thus to be considered in the categorisation of the injuries.

- Managing Confounders to Impairment Assessment:

  - Another medical phenomenon that commonly impacts impairment at MMI may be a departure from the expected pattern and level of the person's recovery (see *Figure* 8).

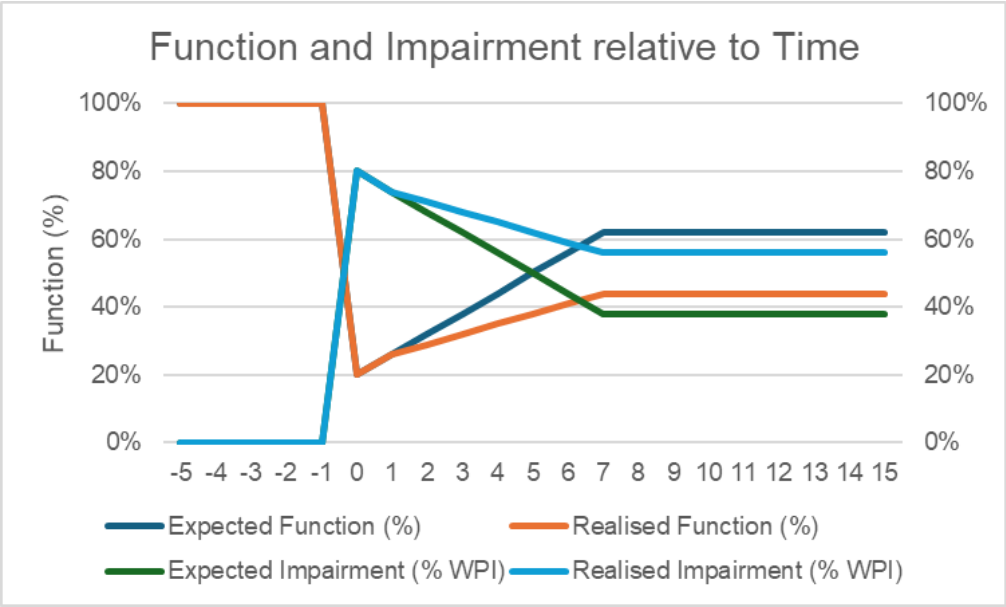

Figure 8: Recovery graph illustrating expected versus realised loss of function showing 38% expected WPI versus 56% Realised WPI at MMI"

  - There are scenarios where a person has a pre-existing impairment that results in a lower functional score at the time immediately preceding injury and even with maximal recovery, pre-existing loss of function cannot exceed the starting point level of function (*Figure* 9).

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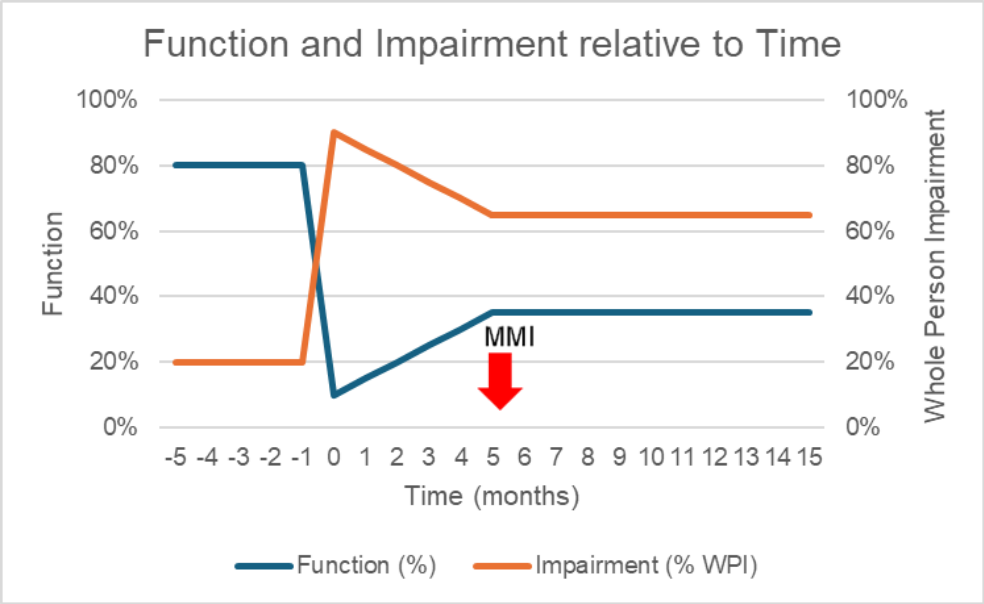

Figure 9: Recovery graph illustrating pre-existing loss of function (20% WPI before the injury) and "65% whole person impairment at MMI".

o. There are specific factors that my impact a person's ability to recover fully in line with what would be expected in other subject, these factors may be – age, pre-existing medical condition (e.g. diabetes), quality of medical care provided, compliance with treatment etc.

p. Implement a systematic approach to identify and account for confounding factors that may influence the assessment, such as pre-existing conditions or lifestyle factors.

- Include a thorough review of the injured individual's medical history to differentiate between injuries directly resulting from the accident and those related to pre-existing impairments conditions to enable application of a modifying factor.

- Engage medical professionals to provide insights into the impact of underlying health conditions on the severity of injuries sustained.

- Utilise statistical models and expert input to adjust compensation calculations for confounders, ensuring fairness and accuracy.

`

q. Develop an adjustment methodology for the said confounders list such that if %WPI at MMI is X, then the Apportioned WPI after adjustment is Y[27]

$$Y = \sum_{\substack{1 \le i \le j \\ i=Assessed\ WPI \\ j=confounder\ impact}} WPI(i,j)$$

$$where\ Y\ is\ the\ Apportioned\ WPI$$

Figure 10: Adjustment methodology formula

- The Fund may need to consider these cases that progress to determine the reason for further deterioration, which reasons may include:
  - Comorbidities,
  - Negligent treatment,
  - Other occupationally related aggravators.
- Baseline injuries, with pre-existing conditions and other confounding factors as listed above, may thus be documented properly for apportionment.
- Injuries that are minor, but complicate further, may need to be considered for possible reopening in order to determine final WPI when the treatment plan has reached finality and a maximal rehabilitation period have been afforded the claimant.
- Consideration must be factored that major injuries may themselves heal completely to ultimately have little or no functional limitations.
- Major injuries may remain as they are and be directly congruent with the functional limitations. from serious injury to 1) healed 2) constant or

[27] The impact of the confounder may be non-linear such that in some instances the Final WPI may a product i.e. an adjustment factor. Different confounders may require different adjustment criteria such the final formula is derived as a composite of various adjustment factors.
`

3) complicated and non-serious injury to 1) healed 2) constant or 3) complicated]

r. Categorise the injuries and determine a monetary award calculation for Value of Life, Pain and Suffering for each injury.

- The final step is to calculate a monetary value of the condition in line with the injury, its severity its impairment and adjusting for confounders or pre-existing medical injuries.

- This solution will use the AMA Guides to categorise the impairment associated with the revised SI list. Injuries will be categorised into various categories, starting with category 0 to category 4. The solution does not require amendment of the regulatory framework, but rather be pragmatically applied to the fullest. The categories created shall be as follows:

  - Category 0: From 0% to 29% WPI and shall be referred to as non-serious injuries,

  - Category 1: from 30 – 40% WPI,

  - Category 2: from 41 – 50% WPI,

  - Category 3: from 51 – 60% WPI,

  - Category 4: from 60% WPI and above.

s. Categorisation of Injury: Exclusion Criteria from further consideration of injury for award:

- Exclude all sub 30% WPI injuries as reported by AMA trained medical practitioner[28] or medical specialist on RAF 4

t. Categorisation of Award:

[28] As defined in Road Accident Fund Act 56 of 1996 (as amended) and Road Accident Fund Regulations, 2008
`

- Categorised Injuries will be awarded monetary award based on injury grade which are classified as follows:

  - Category 1 – to be awarded at the average of the range 30 - 40% of the actuarially calculated monetary value of life for GDs

  - Category 2 - to be awarded at the average of the range 41-50% of the actuarially calculated monetary value of life for GDs

  - Category 3 - to be awarded at the average of the range 51 – 60 % of the actuarially calculated monetary value of life for GDs

  - Category 4 - to be awarded at the average of the range > 60 % of the actuarially calculated monetary value of life for GDs

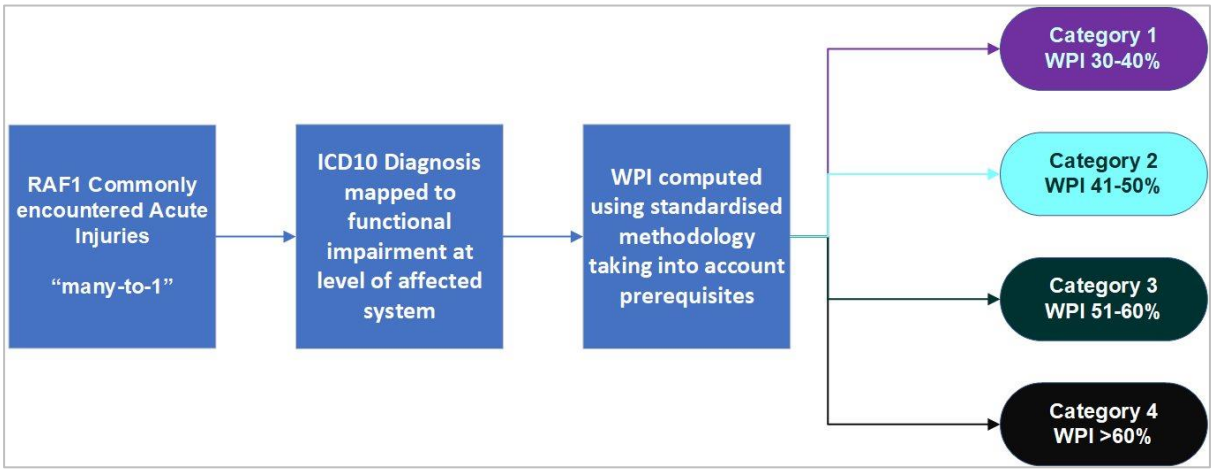

Figure 11: Adjustment methodology formula

u. Categorisation Process

- Categorisation can only be achieved for unitary injuries in their singular form. A condition may have ranges of impairment depending on the severity of functional limitations. The RAF intends to have a standardised tool to ensure proper range alignment. Polytrauma or injuries involving multiple regions are subject to combinations and a standardised tool must be used to determine this.

`

- Cat 1 = All conditions, as defined in the AMA Guides, which conditions meet the minimum of 30% WPI up to and including 40% WPI.

- Cat 2 = All conditions, as defined in the AMA Guides, which conditions meet the minimum of 41% WPI up to and including 50% WPI.

- Cat 3 = All conditions, as defined in the AMA Guides, have a minimum 51 - 60% WPI up to the highest value possibly attainable.

- Cat 4 = All conditions, as defined in the AMA Guides, have a minimum > 60% WPI up to the highest value possibly attainable.

- The categories will carry a GDs Multiplication Factor (GDMF) which is proposed to be the mean of the range.

- NB: The Fund may prefer a 3 Category Classification rather than a 4-Category Classification system, as this will increase the monetary value given the confounders, though such a value of pay out shall not exceed the monetary value of life for general damages.)

- The solution reinforces and initiate the process by the RAF1 submissions, banking and referencing the RAF1 to ensure the RAF4 to be submitted is congruent to the RAF1 for anatomical structure and initial ICD10 Code according to anatomical system.

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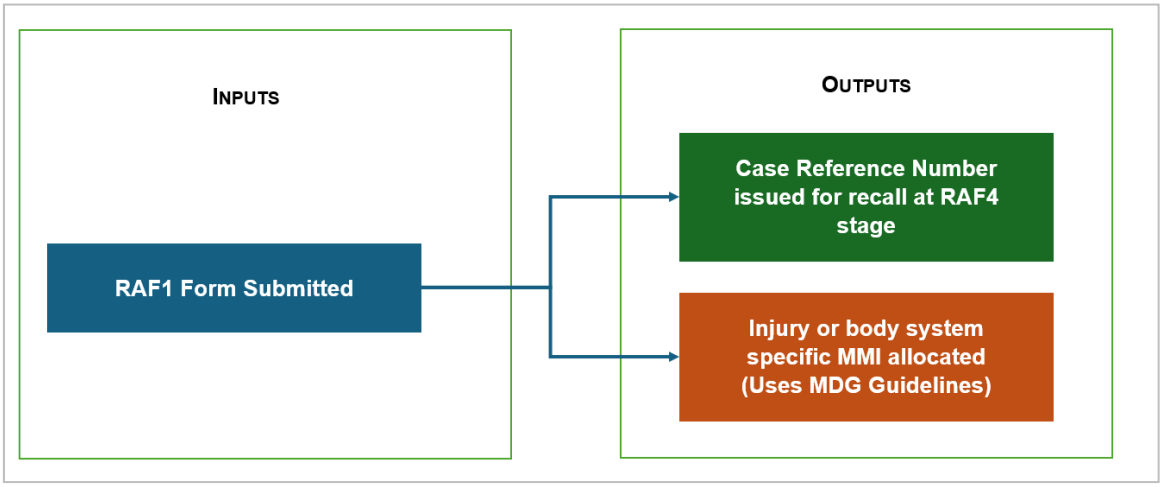

Figure 12: Inputs-outputs representation

- Each anatomical system shall be provided a minimum period to MMI in line with researched and published data for return-to-work durations as the MMI guide.

- The RAF1, using the ICD10 codes, shall be mapped against the codified AMA Guides List of descriptions to ensure that the range of solitary injuries at WPI is immediately computed.

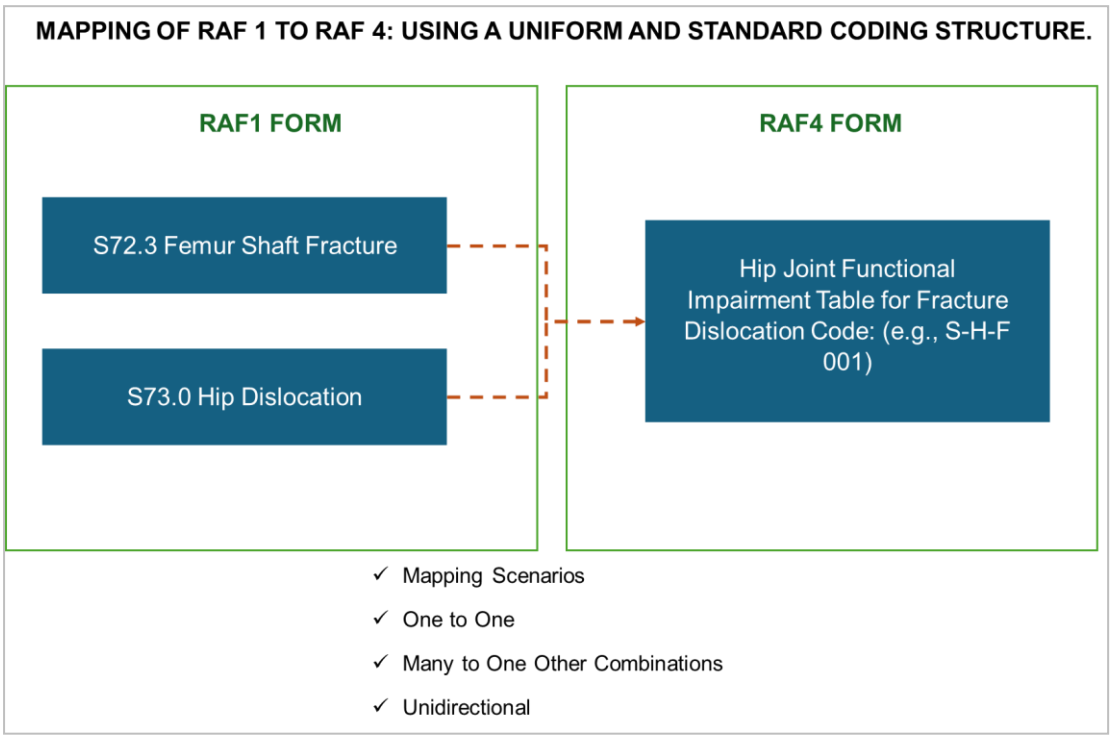

Figure 13: RAF1 to RAF4 mapping

`

- ICD10 Codes that are not aligned to injuries shall be reason for repudiating a claim unless listed as co-morbidities, in which case they will be allocated towards apportionment. Codes that align to a functional impairment table shall then be processed to determine the range within which they fall.

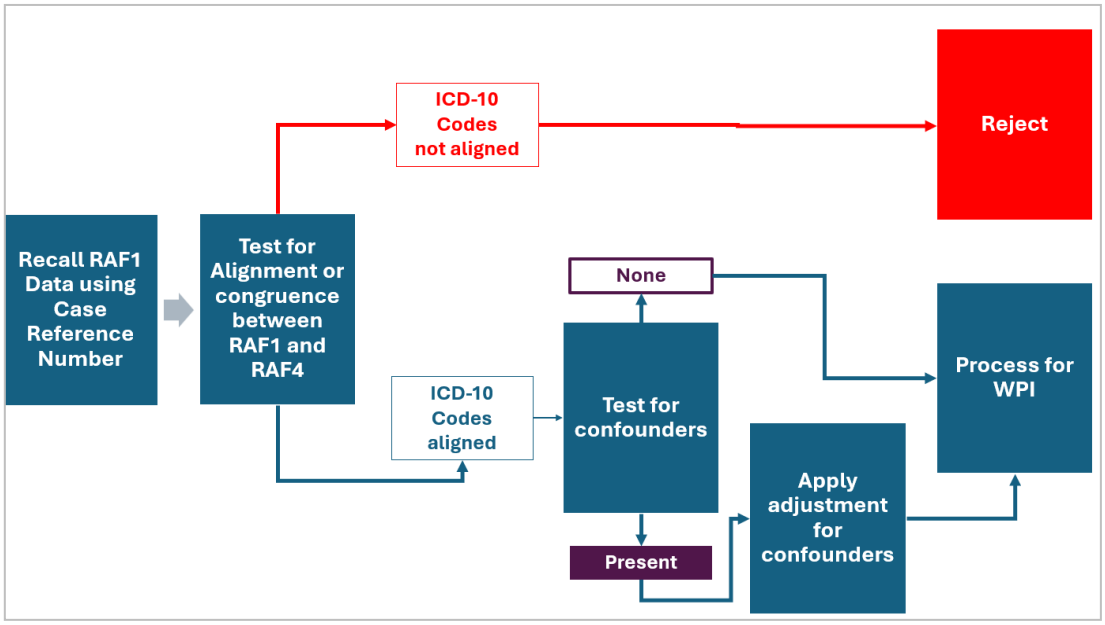

Figure 14: ICD 10 Code alignment flow

- The processing for WPI, shall always yield a range, and all tables within the AMA Guides shall be provided with a range for ease of application.

- Each description within the AMA Guides shall be included and coded for the Solution with reviews of updates being provided on an annual basis, and all descriptions shall be listed for ease of reference and for each range.

- All RAF 4 submitted shall have to carry a functional loss description.

v. GDMF for each Category

- Cat 1 = 35%

- Cat 2 = 45%

`

- Cat 3 = 55%

- Cat 4 = 80

w. Computed Value of Life for General Damages (CV-LGD)

- V[29] shall be the placeholder for the rigorously designed CV-LGD, and V shall have the value of 0 at death.

  - Payout, FOR THE FIRST INJURY, shall thus be, for each category.

  - Cat 1 = 35% *V

  - Cat 2 = 45%*V

  - Cat 3 = 55%*V

  - Cat 4 = 80%*V

- The confounders for Age shall be considered as an adjustment factor μ, where the average annual contribution to value of life for general damages is considered for each year lived, and μ shall reach the value of 1 when the years of life with the most contribution are considered.

- Pre-existing medical conditions shall be considered as another adjustment factor β, where the duration and multiplicity shall weigh heavily and β shall have the value of 1 where there is no chronic or pre-existing condition.

- Payout for subsequent injuries shall follow an apportionment process as defined below.

[29] V - The "value of a statistical life" (VSL1) is an economic concept used to quantify the economic value society places on preventing a statistical risk of death. It represents the monetary value people are willing to pay for reductions in the risk of death, or are willing to accept for increases in the risk of death. This is further defined in Appendix 2

`

- Cat 3 shall only be eligible for a once in a lifetime GDs payout.

- Cat 1 and Cat 2 shall have further apportionment and only if at a higher category, shall a further payout be made i.e.: A First Injury occurs, and claimant is compensated at Cat 1 level.

    - Scenario 1: Second injury leads to WPI (combined for injury 1 and 2) is still in Category 1. There is no further payout.

    - Scenario 2: Second injury leads to WPI (combined for injury 1 and 2) is in Category 2. The payout is the difference between 10%*V (45%X – 35%V)

- For Cat 2 to Cat 3, the pay-out is the difference and amounts to 10%*V

- The RAF shall maintain a database of all GDs payouts which should indicate at prompt of Primary Key Field, the history of payouts.

x. Functional Limitations:

- Functional limitations (based on the very premise of the AMA Guides) need to be documented in line with the prescripts of the AMA Guides, which dictate the proper documentation of the following:

    - Functional History

    - Clinical Evaluation at the stage of MMI

    - Clinical Studies at the stage of MMI

    - Overall conclusions

- A WPI for the causally linked injuries, shall then be derived from this process.

`

- Any other WPI, contributed to the overall WPI by confounders, shall be properly apportioned in line with the AMA Guides methodology, to derive a causally linked WPI which shall then be used for determining the general damages and categorisation to be followed.

- All injuries are to be considered at MMI, the stage at which, by AMA Guides definition, further deterioration is unlikely in the next 12 months, or even if there is deterioration, such a change (improvement / worsening) shall not be more than 5% of the observed functional loss.

- It must also be noted that due to the general pathophysiological mechanisms of motor vehicle accidents, most injuries do not occur in singular form, but are rather of a polytraumatic nature especially to adjacent organs and thus the possible combinations of these should be always elucidated.

- Finally, no injuries, in their combined form, shall ever exceed the 100% WPI. Equally, no person with residual function (i.e., not dead), may be awarded 100% WPI.

- In considering the categorisation of injuries, the description of the functional limitations, i.e., specific organ, organ system or bodily region, shall thus be used. The impairment so derived, shall be categorised in groups of 20% above the threshold, and each group considered per anatomical region to have the linkage and congruence with the Common Initial Clinical Presentation list mapped with the residual functional limitations at the time of maximal medical improvement (MMI).

- The determination of functional limitations is presupposed on certain capabilities being minimum standards required to be able to meet the entry criteria for the full assessment and alignment with the AMA Guides as the guiding document. For each system, a set of pre-requisites are to be defined and strictly adhered to in order to standardise the methodology.

`

y. Summary of Standardisation Framework

Table 8: Assessment pre-requisites

Body System	Anatomical Region	Pre-Requisite	
		Functional Assessment	
		Clinical Examination	
		Clinical Investigations (tests)	

z. Assumptions

- Some assumptions MUST be made as a mandatory standard.

- All assumptions and recommendations are to be in line with current regulations.

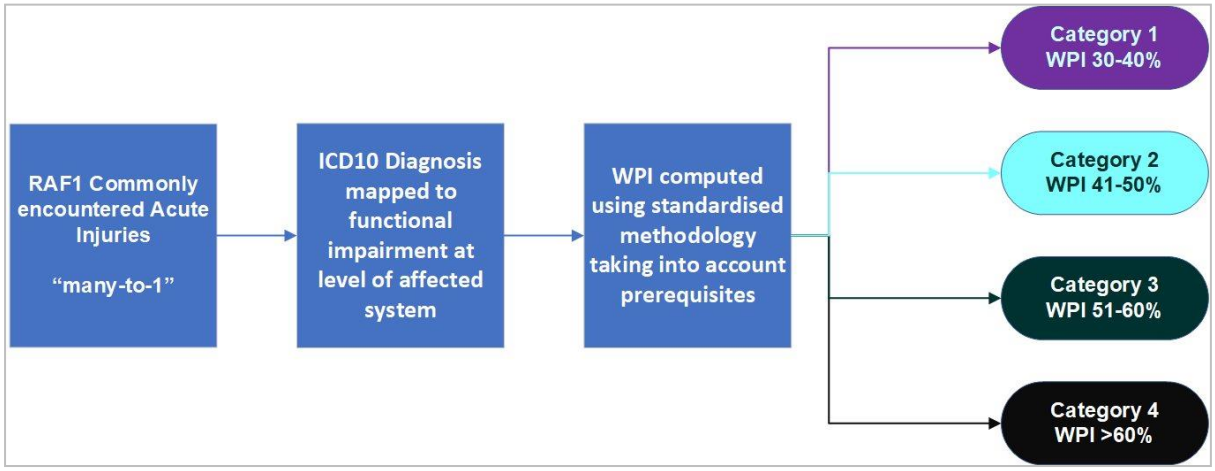

Figure 15: Proposed classification framework and Seriousness Grading

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RISKS AND POSSIBLE MITIGATION

Table 9: Risks and mitigations

Risk	Mitigation
Complexities of the AMA Guides and its applications	Reduce the complexities of the AMA Guides by the following: • The most difficult step in the allocation of final impairment value is the adjustment in the Tables. By averaging the class range, the complexities will be removed. Average the class range instead of adjusting it and have this as a jurisdictional determination, a process respected by the AMA Guides. A process to do this can be outlined in other activities.
Medical reports risk of overstating WPI (fraudulent reports)	• All clinicians can generate RAF1 and describe functional limitations in line with AMA Descriptions, but may struggle with RAF4 at adjustment as outlined above. Averaging will sort this step and any deviation from descriptions will be easily picked up. This will eliminate fraudulent reports, and when coupled with peer review mechanisms, the portion of fraudulent medical reports will go down. The RAF will have substantial savings on the GDs payout in this manner.
Unreliable medical reports (not due to fraud)	• Consider a system of peer review of the submitted reports that links to a maintained database of SA Trained and active assessing doctors and have the CPD linked accreditation through active participation.

`

91.3. The medical aid industry continually practices outsourced peer review mechanisms to ensure there is consequence management emanating from such processes. The RAF may also consider this for medical reports submitted to them.

DATA REQUIREMENTS

91.4. RAF will require the following sample data to verify certain assumptions relevant for Solution 1:

a. A mini sample of claims file data to test compliance of injuries classification seriousness to the intention of the serious injuries list currently used to determine the seriousness during the development and testing phases.

b. A sample of claims with diagnosis poly trauma to provide reference to historical methodology to compare to reference methodology for standardisation.

c. A sample of claims filed to provide ranges of monetary claims awarded to test the compiled reference monetary value data determined in research.

MEDICAL GDS PROCESS ENHANCEMENT RECOMMENDATIONS

91.5. The Online Road Accident Injuries Compensation System is envisaged as a digital platform designed to simplify and standardise the process of filing and managing claims for road accident injuries. In terms of the Act, the RAF must accept or reject the claimants RAF 4 serious injury assessment report within the stipulated time frame from the date on which injury occurred and the date on which the RAF 4 report was submitted, and this shall remain as is.

91.6. This solution aims to enhance predictability, accessibility, transparency and efficiency, ensuring a fair and swift resolution for all parties involved.

91.7. Process Flow Optimisation:

a. Step 1: Claimant Facing

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- User registration and authentication

- Inputs of personal data

b. Step 2a: Clinician Facing

- Treating clinician[30] captures RAF 1 .MMI1. MMI Duration is allowed to pass before the RAF 4 is captured.

c. Step 2b: Clinician Facing

- Treating / Assessing clinician captures RAF 4[31.] This step generates WPI (manual or system driven)

d. Step 3: Medical Adjudicator Facing Verification

- Adjudicator tests for congruence between RAF 1 and RAF 4 to ensure ICD10 in RAF 1 aligns with functional limitations listed in RAF 4. If incongruent, the application is declined.

- Verification of submitted data in RAF 4 by assessing clinician done by RAF Medical Adjudicator

- This step generates WPI (manual or system driven)

e. Step 4: Congruence Test

- Confirmed WPI

- There is alignment or non-alignment of confirmed WPI

[30] A treating clinician is a medical professional who provided treatment to the third party.

[31] RAF 4 can only be captured by an AMA trained clinician, this is referred to in this document as an Assessing Clinician who may or may not be the treating clinician.

`

- If there is non-alignment in final WPI then request for additional supporting information and refer claim back to Step 2 (ii)

- If aligned, then progress to categorisation

92. **Common System Components**[32]

92.1. Periodic Updates:

a. Implement a mechanism to cross-reference injuries with the current regulations and update the system as regulations change or are updated.

b. Implement a mechanism to annually review award increase and reference injuries list review by an independent body.

c. Regularly update the system to align with any changes in the Road Accident Act or related regulations.

d. Maintain communication with legal and medical authorities to stay informed about any modifications to the criteria.

e. Security and Privacy Measures:

f. Implement robust security measures to protect sensitive medical and personal information as required by the Protection of Personal Information Act (POPIA).

g. Adhere to privacy regulations to ensure confidentiality and compliance with data protection laws.

92.2. Communication:

[32] These are features of the system that will be uniform irrespective of the selected Solution option.
`

a. Automated Notifications: Set up automated notifications to keep claimants informed about the status of their claims and any additional requirements.

b. Notifications and updates on claim status, requests for additional information, and resolution progress

c. Clearly defined stages (e.g., claim saved incomplete, claim filed, estimated assessment award, under review

92.3. Verification and Validation:

a. Authentication: Implement user authentication to ensure the validity of claims and prevent fraudulent activities.

92.4. Validation Process:

a. We will define a validation process to verify the authenticity of the medical professional providing information and support documentation.

b. We will define a validation process to verify the accuracy of the captured information against completed medical asses, approved, denied with explanations for each status.

92.5. Legal Compliance:

a. We will ensure that the system complies with local laws and regulations governing personal information (POPIA), injury claims and compensation.

b. The system will be regularly updated to align with any changes in legislation or regulations.

92.6. Automated Decision Support:

`

a. An automated Decision Support System (DCS) will be developed over time to provide insights based on current and future historical data and legal precedents to lessen the burden and demand for human input.

b. The DCS will be render decision for automated assessments against historical values and outcomes to enable periodic review of standard inputs.

PRE-EXISTING MEDICAL CONDITIONS

Impact of pre-existing Chronic Medical Conditions in determining impairment at maximal medical improvement for road accident victims

93. It has been long-established that pre-accident factors have a negative impact on long-term outcome after polytrauma, these include higher age at the time of accident, female gender, chronic diseases, lower educational levels and substandard social environment. Among trauma-related factors the overall injury severity significantly influences the short- and mid-term outcome, but not the long-term quality of life in polytraumatised patients.

94. Chronic conditions and comorbidities can significantly affect the recovery process following major trauma. Chronic conditions such as diabetes, heart disease, chronic obstructive pulmonary disease (COPD), and others can weaken the body's ability to heal and increase the risk of complications during recovery.

95. Comorbidities, which are the presence of two or more chronic conditions in the same individual, can further complicate recovery. For example, a person with both diabetes and heart disease may have impaired wound healing and a higher risk of cardiovascular complications following trauma.

96. These conditions can affect various aspects of recovery, including:

96.1. Healing – Chronic conditions can impair the body's ability to heal wounds, fractures, and other injuries, leading to delayed recovery times and increased risk of infections.

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96.2. Mobility and Functioning – Conditions such as arthritis or neurological disorders can affect mobility and functionality, making rehabilitation and physical therapy more challenging.

96.3. Complications – Chronic conditions can increase the risk of complications such as infections, blood clots, and organ failure during the recovery process.

96.4. Psychological Impact – Dealing with chronic conditions alongside the physical and emotional trauma of a major injury can also impact mental health and overall well-being, potentially prolonging recovery.

97. From the literature, potential determinants of functional outcome have been identified. These determinants of functional outcome have been grouped into:

97.1. socio-demographic (age and gender, education level (typically divided into primary school level or higher education), household composition (divided into households existing of a single person or more persons), and co-morbidity (defined as a previous disease at the time of trauma)),

97.2. injury (ISS, Revised Trauma Score (RTS), and injury location), and

97.3. health care related characteristics.

98. Co-morbidity is often divided into:

98.1. a group without a co-morbidity,

98.2. a group with only one co-morbidity and

98.3. a group with two or more co-morbidities.

99. Absence of co-morbidity has been established as an independent predictor for less mobility (refer to impairment) related limitations (OR =0.5), limitations for usual activities (OR=0.4), pain or discomfort (OR=0.2) and anxiety or depression (OR=0.3).

`

Table 10: the charlson comorbidity index

Number	Condition	Original CCI	Quan's Updated CCI	Elixhauser Comorbidity Index
1	Myocardial Infarction	1		
2	Peripheral Vascular Disease	1		1
3	Cerebrovascular Disease	1		
4	Congestive Heart Failure	1	2	1
5	Peptic Ulcer Disease	1		1
6	Diabetes Mellitus	1		1
7	Diabetes Mellitus with end-organ damage	1	1	1
8	Chronic Pulmonary Disease	1	1	1
9	Connective Tissue Disease	1	1	1
10	Dementia	1	2	
11	Mild Liver Disease	1	2	1
12	Moderate and Severe Renal Disease	2	4	1
13	Hemiplegia	2	2	
14	Metastatic Cancer	2	6	1
15	Leukaemia	2	2	1
16	Lymphoma	2	2	
17	Moderate or Severe Liver Disease	2	4	1
18	Acquired Immune Deficiency Syndrome	2	4	1
19	Alcohol and Drug Dependence			1
20	Pulmonary Circulatory Disorder			1
21	Hypertension			1
22	Hypothyroidism			1
23	Obesity			1
24	Malnutrition			1
25	Anaemia			1
26	Psychosis			1
27	Major Depression			1
28	Neurologic or Neurodegenerative Disorder			1
29	Other Paralysis			1

`

ESTIMATING THE VALUE OF A STATISTICAL LIFE FOR ROAD ACCIDENT VICTIMS

Definition of the value of a statistical life

100. The "value of a statistical life" (VSL) is an economic concept used to quantify the economic value society places on preventing a statistical risk of death. It represents the monetary value people are willing to pay for reductions in the risk of death or are willing to accept for increases in the risk of death.

101. VSL is often used in cost-benefit analysis to assess the benefits of policies or projects that affect mortality risks, such as safety regulations, healthcare interventions, or environmental policies. By assigning a monetary value to the prevention of death increases in the risk of death, policymakers can either:

101.1. compare the costs of implementing such measures with the benefits they provide in terms of lives saved or injuries prevented, or

101.2. compare the costs introduced by the increased risk as a result of a programme measured against the benefits they provide in terms of broader societal welfare.

102. For the Road Accident Fund, VSL can be estimated using various statistical techniques based on individuals' behaviour (contingent valuation or stated preferences) in a market where risks of mortality are increased by the driving of motor vehicles within the Republic. While it has limitations and controversies, VSL will be able to provide a practical way to incorporate the value of human life into economic decision-making processes, i.e., the compensation awarded when an individual suffers non-pecuniary loss due to the driving of motor vehicles.

Definition of Willingness to Accept

103. In welfare economics, "willingness to accept" (WTA) refers to the minimum compensation that an individual is willing to accept in exchange for giving up or forgoing a particular good, service, or opportunity or accepting a negative change in personal circumstances. It's a concept often used in analysing individual preferences and welfare in the context of economic decision-making.

`

104. WTA is important as it helps economists understand the subjective value individuals place on different goods or changes in their circumstances. By computing WTA, the RAF will be able to understand what individuals are willing to accept as compensation for impairments suffered as a result of a motor vehicle accident.

105. This can be estimated by a contingent valuation or preference survey through asking individuals how much compensation they would require for the resultant change in personal circumstances as a result of an injury suffered during the motor vehicle accident.

106. Overall, WTA may help the Fund make more informed decisions about resource allocation, regulation, and policy aimed at improving overall societal welfare.

Modelling the Value of a Statistical Life

107. We consider a standard single-period VSL model. The individual maximises his (state-dependent) expected indirect utility which is given by -

$$V \equiv p.u(w)+(1-p).(v(w)$$

where ***p*** is the probability of surviving,
u(w) is the utility of wealth w^3 if he survives, and
v(w) is the utility of wealth w if he dies, where
u > v and ***u' > v'*** ≥ 0

Figure 16: Expected Indirect Utility

108. Similarly, the willingness to accept (WTA) for a mortality risk increase

$$\Delta \boldsymbol{p} \equiv \boldsymbol{\varepsilon}$$

$$\Delta \boldsymbol{p} \equiv \boldsymbol{\varepsilon}$$

is denoted P(ε) and is given by the following equation -

$$V= (p- \varepsilon).u(w+P(\varepsilon))+(1-p+\varepsilon).v(w+P(\varepsilon))$$

At any wealth level, both utility and marginal utility are larger if alive than dead.

`

Preference elicitation

109. As mortality risk reductions per se are non-marketed goods, we will have to rely on non-market valuation methods in order to estimate VSL. These methods can be classified into two types, revealed- and stated-preferences methods. Both approaches have their strengths and weaknesses. Revealed preference (RP) methods use the information from choices made by individuals in existing markets, whereas stated preference (SP) methods employ hypothetical market scenarios.

110. In RP studies information is obtained from situations where individuals make actual trade-off decisions, either implicitly or explicitly, between wealth (foregone consumption) and physical risk. Economists usually prefer RP to SP methods when non-marketed amenities are to be evaluated. With actual (and often repeated) choices, individuals have incentives to identify and understand the choice alternatives. Hence, preferences elicited in RP studies are not only based on actual behaviour and thus are expected to be more consistent, but are also assumed, compared to hypothetical choices made by respondents in SP studies, to be made on a more informed basis. In this case, using historical settlements may be indicative of revealed preferences as opposed to conducting new research in surveys to establish stated preferences.

Confounders

111. Age – The theoretical prediction of the effect of age on VSL is indeterminate, since the relationship is determined by the optimal consumption path which depends on assumptions on discount factors, saving opportunities, etc. Regarding empirical evidence, the findings in most studies support that VSL follows an inverted U-shape, is declining, or is independent of age.

112. Health status – It is intuitive to expect that people in good health should be willing to accept more when there is an increased risk of fatality, since they in a sense have more to lose. However, health may also affect the marginal utility of wealth, which may potentially have some offsetting effects. Moreover, health is expected to negatively affect the VSL through its positive effect on survival probabilities (the dead anyway effect) and to positively affect the VSL through its positive effect on the future flow of incomes and from reduced health care expenditures (the wealth effect).

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PROPOSED STANDARD FORMULAE AND METHODOLOGY FOR GENERAL DAMAGES

113. To establish the formula that will be used in the computation of GDs, considering the range of factors that have been outlined in the sections above, the RAF will consider making use of a statistical modelling approach, specifically multivariate regression analysis.

114. The main objective of this is to model the relationship between the dependent variable (the GD compensation amount) and multiple independent variables (such as age, gender, WPI, underlying diseases, base value, and other variables which may be relevant).

115. This statistical modelling approach will include:

115.1. Collection of data – This includes information from historical settlements made by the RAF with respect to GD, as well as information on factors that could influence the level of the GD awarded to claimants, such as the severity of the injury, age of the claimant, medical expenses incurred, emotional distress, and so on.

115.2. Selection of appropriate variables – This involves identifying key variables that are relevant to determining general damages, including demographic information (age, gender), characteristics of the injury (type and severity – as determinable by the WPI factor described in this document), economic factors (lost income, medical expenses), and any other factors that may be pertinent.

115.3. Conducting the regression analysis – By using appropriate statistical methods and software, a regression analysis will be conducted on the data collected using appropriate regression techniques.

115.4. Specification of the model – Making use of the regression analysis, an appropriate model will be developed to output the level of compensation to be awarded for GDs, based on the selected variables.

115.5. Evaluation of the model – An assessment of the goodness-of-fit of the regression model will be performed to evaluate its predictive accuracy.

`

The interaction effects will be analysed to identify any potential interactions between variables and assess whether their combined impact differs from the sum of their individual effects. This will identify which variables have the most significant impact on the compensation formula, guiding stakeholders on areas that may require special attention or further investigation.

115.6. Interpretation and application of the model – It will be important to interpret the coefficients of the regression model to understand how each variable could affect the compensation awarded for GDs. The established model equation will also be tested for new cases based on their characteristics to predict the level of GDs compensation.

115.7. Validation and refinement of the model – As additional data becomes available, it will be important to validate the established model equation for GDs, refining it as needed to improve its accuracy and reliability. Sensitivity analysis will also be performed to assess the impact of changes in individual variables on the overall compensation amount.

116. By utilising this statistical modelling approach, the resulting formula for general damages compensation will encompass the subtleties of age, gender, WPI, underlying health conditions, and the base value, thus guaranteeing a thorough and precise reflection of the factors impacting compensation payouts. This approach aligns with both legal mandates and the practical guidelines set forth by the RAF.

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CHAPTER 4: LOSS OF EARNINGS (LOE)

CURRENT LANDSCAPE

117. The Loss of Earnings (LoE) involve futuristic assumptions about earnings capacity of the claimant.

118. The Road Accident Fund leverages the use of an external panel of medical experts to complete an assessment of the case that enables the RAF to establish postulations. The expert panellists are mainly Industrial Psychologists and/or Educational Psychologists as the case may be. Other specialists may also co-opt as and when required.

119. The common challenge as observed is large variability in the derived postulations leading to settlement values and the use of non-standard indicators often leading to overstatement of the settlement estimates.

120. There seems to be inconsistent co-relation between current economic data, labour market performance, employment data, university and school completion rates, and other socio-demographic data that is used to inform these estimates. The overall conclusion is that the estimates are largely subjective.

121. This is particularly problematic in younger claimants where the estimates must heavily rely on theoretical assumptions as there is no basis to establish the individualised level of performance in future educational endeavours and/or the job market performance for the individual.

122. In adults who have established careers, the scenario is often better, as there is available historical data – employment records, income history, job performance data, reference check through work-site visits, and other reports from current and previous employers. This data is then used to establish projected earning potential and ceilings into the future with much closer to reality estimates.

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123. The worksite assessment seeks to assess the cognitive, emotional, and physical abilities of the claimant in terms of assessing the ability to perform in the current or alternative jobs. However, the challenge herein is often evaluating the potential for placement into alternative employment or other career opportunities that reduce the potential lost earnings.

124. The result is as follows:

124.1. Overly optimistic scenarios.

124.2. Utilisation of subjective and generic approaches to postulating without being case-specific.

124.3. Lack of harmonisation between Industrial Psychologist (IP) Reports and Educational Psychologist (EP).

124.4. Disjuncture between Occupational Therapist (OT) and IP and EP reports.

124.5. Unreliable and unrepeatable Actuarial model and stated assumptions.

124.6. Wide variations in job or career choice and estimated postulations.

124.7. Little recognition of potential for change in earnings potential following medical treatment of the injury.

124.8. No correlation between current education and the job-market performance of individuals and the theoretical assumptions.

124.9. Use of non-standard psychometric tests in assessing career performance potential.

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THE RAF CLAIMS PROCESS

125. The diagram below depicts the current end-to-end process map followed by claimants.

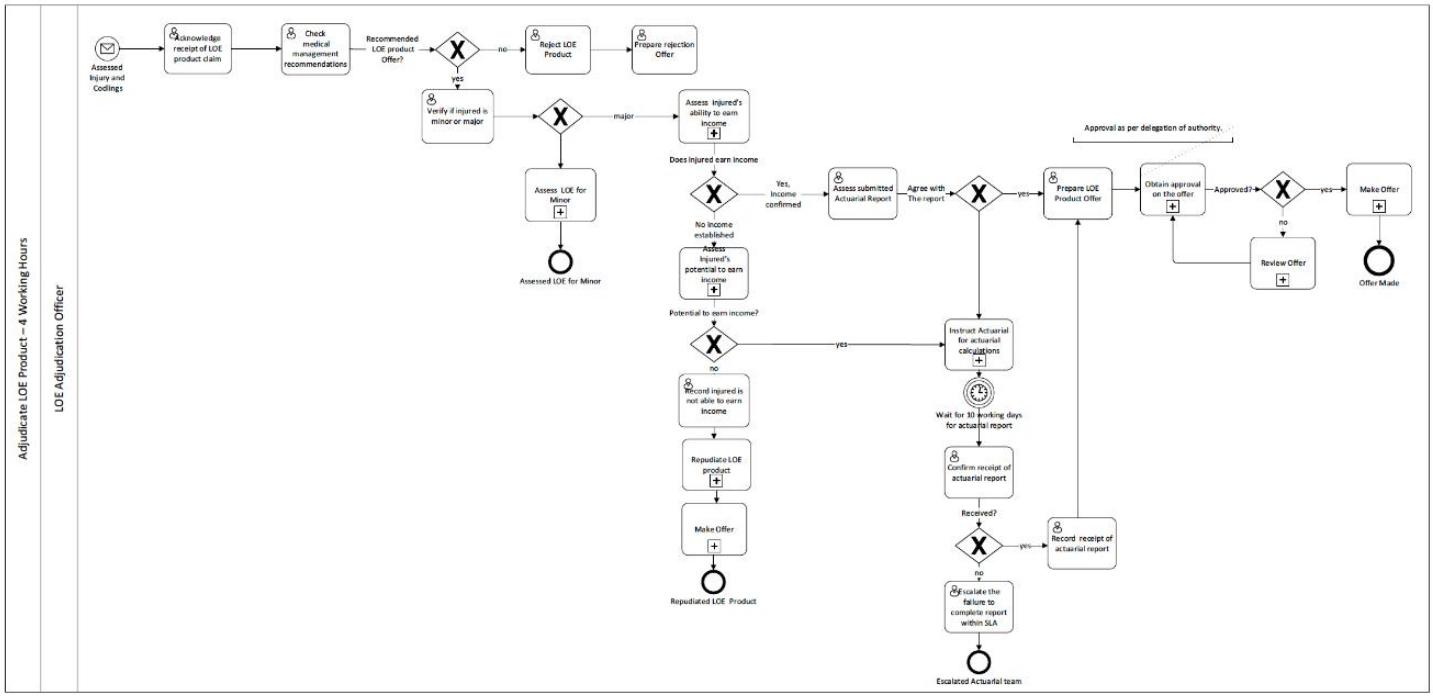

Figure 17: Loss of Earnings process flow

The RAF actuarial operation and process

126. Currently, the RAF's 5 main regions of Johannesburg, Pretoria, Cape Town, Durban and East London send electronic instructions by email to a central mailbox for Requests for Calculations (RfCs) which require the RAF actuarial team do calculations for them.

127. For purposes of avoiding bottlenecks and delays, the RfCs are categorised into four (4) priority rankings based on urgency levels:

127.1. **Level 1: Critical** – these RfCs are issued on the day of the trial and require a finalised actuarial report to be availed within a turnaround time (TAT) of 3 working hours from the time the instruction is received;

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127.2. **Level 2: High** – these RfCs assignments are issued 10 days prior to trial and require the furnishing of a finalised actuarial report within an 8 working hour TAT from receipt of instruction;

127.3. **Level 3: Normal** – RfCs issued more than 10 days but less than 30 days before trial require an actuarial report within 24 working hours which amount to the equivalent of 3 working days from the time the instruction is received;

127.4. **Level 4: Low** – these RfC assignments are issued more than 30 days before trial with the expectation of an actuarial report within 32 working hours or 4 working days from receipt of instruction. This priority category includes all unrepresented matters.

128. At present, most cases received by the RAF are in the Level 4 urgency level category which provide sufficient room for out-of-court settlements which are much quicker and less costly.

129. Approximately 2 000 LoE and Loss of Support (LoS) cases are settled on a monthly basis. On average, the RAF does calculations for around 450 to 460 cases month-on-month. The balance thereof either obtains default judgement or, if they are below the R500,000 threshold, are merely settled without actuarial calculations or defendant actuarial calculations.

THE ACTUARIAL MODEL AND ASSUMPTIONS FOR LOE CLAIMS

130. The loss of earnings experienced by the injured individual in an LoE matter is the difference between the pre-accident income forgone following onset of the accident (opportunity cost) and the actual RAF social insurance compensation benefit (post-accident earnings).

131. The loss is split into ‘past’ loss and ‘future’ loss. Past refers to the period between the date of accident and the date of on which the calculation is performed, whereas future refers to the period from the date of calculation onwards.

132. The past loss of earnings is the difference between the net of tax income that the injured would have earned had the accident not occurred and the post-accident net of

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tax income that they earned. This income is assessed from the date of the accident to the date of calculation, without allowing for interest.

133. For future loss of earnings, the present value (PV) of future earnings had the accident not occurred (pre-accident earnings) is calculated by discounting the net of tax projected earnings, allowing for interest and mortality.

134. Similarly, the present value (PV) of post-accident future earnings is calculated by discounting the net of tax projected earnings, allowing for interest and mortality.

135. The future loss of earnings is the difference between the above-mentioned present values (PVs).

136. Inflation assumption

136.1. General inflation refers to the rate at which the general level of prices for goods and services is rising. This escalation of prices of goods and services leads to a decline in purchasing power of the South African Rand (ZAR). Inflation is measured by the Consumer Price Index (CPI) published by Statistics South Africa as a benchmark for general inflation.

136.2. Earnings inflation refers to the rate at which the earnings of the injured or deceased are escalated due to growth. In the absence of career progression/postulation, the RAF assumes that the earnings increase in line with general inflation.

136.3. It is important to note that earnings may be split into a number of components, and different components may grow at different inflation rates.

136.4. For foreign nationals who work outside of South Africa, the RAF uses published inflation rates for that country and salary scales for past earnings. For future inflation, the future inflation that is used is such that the net discount rate is approximately 2.5% per annum.

136.5. The following webpages are also used to obtain inflation calculators:

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136.6. https://fxtop.com/en/inflation-calculator.php

136.7. https://www.inflationtool.com/

137. The assumed rate above inflation that the injured earns on their claimed amount in the future is called the net discount rate. This rate should be somewhere between the long-term bond yield, the risk-free rate of return on index linked bonds after tax, and the return which can be earned on a diversified portfolio of assets.

138. The relationship between the interest rate (i), the inflation rate (f) and the net discount rate (r) is shown below:

$$(1+i) = (1+r)\ X\ (1+f)$$

Figure 18: Interest rate-inflation relationship

139. The RAF uses a net discount rate of 2.5% per annum in its LoE and LoS calculations.

140. Mortality refers to death. It is affected by age (the older a person gets, the higher the probability of dying), gender (females generally live longer than males) and socio-economic status (the more one earns, generally they have better access to medical and other amenities and hence the better their mortality).

141. The life tables that the RAF uses to model mortality in the South African population are the life tables found in the Quantum Yearbook. There are six tables which are constructed from the South African Life Tables 1984-86 (SALT 84-86). These life tables are guided by an individual's annual income.

142. The RAF only uses the moderate Life Tables 2 to 5 and thus excludes the Life Tables 1 and 6 which are viewed as being too extreme. Life Table 2 is the same as South African Life Tables 1984-86 (SALT 84-86) Whites and Life Table 5 is the same as South African Life Tables 1984-86 (SALT 84-86) Coloureds. The RAF only uses Life Table 2 in calculations for minors.

143. In cases involving impaired mortality or foreign nationals, adjustments to life expectancy may be necessary. These adjustments are made based on

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recommendations from medical experts such as orthopaedic surgeons, specialist physicians, neurosurgeons, and others.

144. The probabilities of survival and death are accounted for in the RAF's LoE and LoS calculations using life tables. Additional detail on the specific assumptions around this are provided in this paper.

145. Contingencies refer to events that have a likelihood of occurring with uncertain outcomes and are difficult to quantify. These events have the potential to impact earnings, expenses, or the need for support in both the past and future.

146. Examples thereof include changes in taxation rates, fluctuations in inflation, early death or retirement, divorce, remarriage, adoption, changes in general health, accidents, labour strikes, and periods of unemployment, among others. These factors are typically considered by attorneys when determining the level of contingencies to take into account for claims.

147. Contingencies are implemented as a percentage deduction from the projected income for each year. Their level typically involves negotiation among parties involved and/or decisions by the court. For illustrative purposes, the RAF often applies the general contingencies as found in the Quantum Yearbook to both past and future calculations.

148. It is very common to apply a past contingency deduction of 5%. This can be increased if the accident occurred a long time before the calculation date or if there are other factors that warrant a higher-than-normal contingency deduction. Regarding future contingency deductions, the so-called normal contingency deduction to apply is 15%, which is also adjustable on a case-by-case basis.

149. For accidents that occurred on or after 1 August 2008 a yearly limit is applied on the amount that can be claimed from the RAF, and the RAF will accept liability to compensate only up to this limit. It is generally referred to as the "RAF Cap" or "the CAP" and is adjusted on a quarterly basis in line with Consumer Price Inflation (CPI).

150. The CAP is applied per the Supreme Court ruling in **RAF v Sweatman**, which in essence states that tax, the net discount rate and survival probabilities are applied to

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the loss before the limit's application. Additionally, due to rulings in the matters **Sil vs RAF and Nel vs RAF**, contingencies and merit apportionment deductions are also accounted for before the limit's application.

151. Merits apportionment is the allocation of responsibility or fault for a road accident among the parties involved. It is a process used to determine the degree of liability or blame that each party bears for an accident. Merits apportionment seeks to assign a percentage of responsibility to each party involved based on their level of contribution to the accident.

152. This percentage represents the proportion of liability that each party bears for the accident. The compensation amount may be reduced proportionately to the victim's allocated percentage of responsibility for the accident. A merits apportionment of 80% in favour of the injured (or 20% against the injured) means that the injured is only entitled to 80% of the claim.

153. Inputs into the model are obtained from the claim file that is provided to the RAF claims administrator by claims officers in RAF's regional offices. These inputs include the following information for LoE and LoS matters:

153.1. Name of Injured

153.2. Date of birth

153.3. Gender

153.4. Date of accident

154. The pre-accident and post-accident income projections, as outlined by Industrial Psychologists, earning experts, Forensic Accountants or in some cases, as Instructions by Attorneys or Claims Handlers.

155. The following reports are considered as helpful aids to LoE and LoS calculations:

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155.1. Occupational Therapist report

155.2. Orthopaedic Surgeon report

155.3. Educational Psychologist report (especially when the injured is a minor)

155.4. Neurosurgeon report

155.5. Specialist Physician report

155.6. Life expectancy report

155.7. Medical Specialist report

156. The Industrial Psychologist provides a pre-accident career postulation. The Industrial Psychologist postulates the pre-accident scenarios based on the reports listed above. This is what the Industrial Psychologist opines would have happened had the accident not happened.

157. The Industrial Psychologists use the reports listed above in postulating how the Injured will progress in future after the accident has occurred.

158. When working on LoE calculations, the following information is to be taken into cognisance:

159. The Injured's income at the time of the accident should be obtained from the reports provided above. When such information is unavailable, the RAF uses the income stated in the Industrial Psychologist report.

160. The RAF takes account of the Injured's actual earnings from the time of the accident to date. If there are any employment changes, these should be accounted for. In the Industrial Psychologist report there is usually an outline of the Injured's employment history.

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161. Periods off work

161.1. If the Injured is absent from work as a result of the accident and they receive a reduced income or no income at all, the RAF accounts for this reduced income in the calculations.

161.2. Sick leave received whilst the Injured is off work is also accounted for in the calculations. However, annual leave and gratuitous payments received whilst the Injured is off work are accounted for in the calculations.

161.3. If there is no indication of whether the Injured received an income or not whilst off work, it is assumed that they received their normal guaranteed income only (excluding benefits such as overtime and shift allowance) and deference is made to factual information.

161.4. If advised that the injured was on sick leave and annual leave after the accident, the RAF assumes that the injured was on sick leave for six weeks (as per the Basic Conditions of Employment Act). It can also be assumed that the remainder of the period off work was annual leave.

162. Periods of unemployment

162.1. Where the Injured is unemployed due to accident-related reasons, the RAF accounts for the period of unemployment.

162.2. If the unemployment is due to reasons not related to the accident (e.g. pregnancy, incarceration etc), a loss of earnings is not assessed during the period of unemployment.

162.3. The expected retirement age (ERA) is the age at which a person retires from active employment. Normal earnings stop, and claimants may then become eligible for retirement benefits (lump sum, pension, provident fund payout etc). ERA differs between different industries, and by individual.

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163. When valuing retirement benefits for LoE matters, two methods are considered by the RAF:

163.1. Valuing retirement benefits explicitly based on the actual fund rules.

163.2. This method operates under the assumption that both the employee and employer contributions are invested and remain untouched until retirement. The outcome varies depending on whether the retirement fund involved is a defined benefit or defined contribution fund. Upon retirement, the injured individual may receive either an annuity/pension or a combination of an annuity/pension and a lump sum payment. However, for capping purposes, the RAF typically assumes that any lump sum received will be converted into an annuity upon retirement.

163.3. Employer's contributions as non-taxable income

163.4. For this method, the RAF accounts for the employer's contributions as non-taxable income. These benefits are accounted for each month/week from the time of the accident until the date of retirement. No benefits are accounted for after retirement.

164. It is important to note that losses may extend beyond the date of retirement if the injured was entitled to post-retirement benefits.

165. The RAF will generally be instructed on the ERA to assume in the calculations. In the absence of any guidance, the RAF will typically assume the following:

165.1. For employed individuals: ERA of 65.

165.2. Self-employed individuals: ERA of 70.

166. In the event that the Injured has passed away by the time of trial or settlement, the estate retains a right to compensation for past loss of earnings accrued to the date of death.

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167. For dates on or before the 20th day of the month, the calculation date is taken as the first day of the following month. After the 20th, it is taken as the first day of the second month after the current one.

THE ANALYSIS OF INCOME FOR LOE MATTERS

168. A wide range of income categories are considered for the calculation of loss of support and loss of earnings. These include those listed below.

169. Salary/Wages

169.1. This pertains to the consistent income earned by individuals through employment under an institution or individual. The gross salaries of employees are typically documented in various forms such as payslips, salary advice notes, employer's certificates or certificates of employment, IRP5 or employee's tax certificates, employment contracts, and similar documents.

169.2. Employment benefits may include basic salary / wages, medical aid subsidies, bonuses, overtime pay, retirement funding and allowances such as those for housing, phone or transport – which are all subject to personal income tax as per rules of the South African Revenue Service (SARS). When only one payslip is available, the RAF's best practice is to use the year-to-date taxable earnings shown to estimate the annual income.

169.3. The RAF assumes that the approximately 50% of allowances are consumed for personal use e.g., cell phone allowance and transport allowance. In cases where allowances are specified, the RAF only accounts for 50% of the benefits in both LoE and LoS calculations.

169.4. The net salary after the tax deduction is used in loss of earnings and loss of support calculations.

169.5. Net Profit

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169.6. This refers to the earnings of self-employed individuals (business owners). Net profit is calculated as business revenue minus expenses, information which is typically found in the financial statements of the business, along with shareholding details. Further analysis of profit and any related projections can be obtained from a forensic accountant report.

169.7. Profits from a sole proprietorship and a partnership are subject to individual tax as per the SARS rules. Companies and small business corporations are subject to different tax rates published by SARS. Company and small business corporation owners withdraw business net profits as dividends. In addition to the applicable business tax, dividends tax is therefore also applicable.

169.8. Net profits after tax deductions are used in the calculation of loss of earnings and loss of support calculations.

169.9. If no information is provided with regards to the type of the business, the RAF assumes that the business is a sole proprietorship and that all the profits are distributed to the injured/deceased, before personal income tax is then applied.

170. Retirement benefits

170.1. This includes a regular pension and/or lump sum benefits received by a person who has retired, resigned or has been retrenched. A benefit schedule from the retirement fund administrator shows the benefits received. Pensions are usually increased annually by retirement fund administrators based on the fund rules. If no information is provided about how the pensions increases, the RAF assumes that they increase in line with CPI.

170.2. Retirement benefits are classified either as defined contribution or defined benefit.

170.3. A defined contribution pension plan is one where the employer and employee make contributions, and those contributions are invested over time to provide a payout at retirement. The final benefit amount of the pension is unknown because it is based on contributions and growth, and investment returns are

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unpredictable and subject to market volatility. For calculation purposes, the RAF assumes that the investment returns grow in line with earnings inflation.

170.4. Defined benefit plans provide specific and predictable benefit (or amount of income) at retirement. Essentially, a defined benefit plan offers guaranteed income for life. They are usually calculated based on the final pensionable salary, years of service and age at retirement.

170.5. Pensions are subject to personal income and retirement lump sums are subject to retirement lump sum tax (based on the nature of the retirement).

170.6. The RAF deals with pension benefits as follows:

170.6.1. Accounted for based on the applicable fund rules post-retirement; or

170.6.2. By allowing for non-taxable income equivalent to the employer's retirement fund contributions as part of monthly/weekly income.

171. Reported income

171.1. In the absence of the source documents indicating the actual income received, earnings are taken as reported by the Assessors, Industrial Psychologists or other medical experts.

171.2. In some cases, the RAF may have data on past salary increases (e.g. government employees, industry papers, minimum wages etc). The RAF may also have information regarding likely salary growth in future (industry standards, or indication by the employer). Alternatively, the RAF may be instructed by the industrial psychologist or attorneys to assume a certain level of growth.

171.3. In LoE calculations, the following earnings information is used:

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171.4. Income at the time of the accident.

171.5. Income received during the period the Injured was off work following the accident.

171.6. Income received after the injured returned to work to date, where applicable.

171.7. Postulated earnings for the pre-accident and post-accident scenarios.

171.8. Retirement income or an estimate thereof.

172. Risk benefits

172.1. Risk benefits are a type of insurance where benefits are paid out if a person passes away, or is unable to work anymore, or someone in their family passes away.

172.2. Risk benefits typically cover life assurance, disability benefits and funeral cover. The employer's contributions are not accounted for in LoE calculations.

172.3. A rule of thumb regarding risk benefits is that if the employer contributes towards the risk benefits, then the RAF accounts for the risk benefits in its calculations. However, death benefits (and all benefits received as a result of death e.g., pension benefits to dependants) are not accounted for based on the Assessment of Damages Act. Some examples of risk benefits are group life, income protection benefits and funeral cover.

173. Self-employment or Business income

174. Income from self-employed persons or business owners may be received in one of the following forms:

174.1. Forensic accounting report – this expert report indicates the profit history from the period prior to the accident to date. Furthermore, the Forensic accountant

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postulates on the likely pre-accident and post-accident scenarios. In some instances, this report will indicate what the past loss is and what the postulated future pre-accident and post-accident career scenario should be.

174.2. Reported income by means of affidavits.

174.3. When no information is provided, the RAF uses self-employment earnings per the Quantum Yearbook, depending on the type of work they were doing, normally assuming the median earnings on the applicable scale.

175. Foreign earnings

175.1. There are cases where a person who works outside of the borders of South Africa is involved in an accident within the borders. In these cases, the RAF makes the following changes to the assumptions used:

175.1.1. Use tax rates that are applicable to the Injured's country or state;

175.1.2. Use life tables that are applicable to the Injured's country or state;

175.1.3. Use past inflation that is applicable to the Injured's country or state;

175.2. Regarding future inflation, the RAF only needs to achieve a net discount rate of 2.5% per annum.

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DEDUCTIONS AND NON-DEDUCTIBLES FOR LOE MATTERS

176. Disability grants and state old pensions

176.1. Disability Grants are financial benefits provided to individuals living with a disability who are South African citizens, permanent residents, or refugees residing in South Africa. To qualify for a Disability Grant, both the disabled person and their spouse (if applicable) must meet the criteria outlined in the Means Test.

176.2. Disability Grants are available for individuals between the ages of 18 and 59, while State Old Age Pensions are accessible for those aged 60 and above until death. Information relating to the Disability Grant received and State Old Age Pensions can be found from letters or printouts from the South African Social Security Agency (SASSA).

176.3. According to the ruling of Kapa v RAF (2018), the State Disability Grant should be deducted from the total loss of earnings. The RAF values the income of the Disability Grant separately, assuming that the injured will not satisfy the means test after the settlement of their claim. Therefore, no account is taken for the Disability Grant in future (from the calculation date until death).

176.4. These grants are not subject to any taxes. The actual values are accounted for in loss of earnings calculations without any deductions.

177. Unemployment Insurance Fund (UIF) benefits

177.1. The UIF benefits are received by a person when their employer terminates them from service. This is a tax-free benefit. Actual UIF benefits are accounted for in LoE calculations.

177.2. It is important to note that although the employer contributes to UIF, the employer’s contributions cannot be taken as income.

178. Disability/Income protection benefits

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178.1. If the Injured has Disability/Income Protection policies, they may receive financial compensation if they are disabled, either in an accident or due to an illness, and are unable to work. The benefits stop if the person returns to work. The amount paid can either be a lump sum or a recurring income benefit.

178.2. These benefits are not taken into consideration in LoE calculations if the person subscribed to them in their personal capacity. If a person had already been receiving these benefits before the accident and they die as a result of an accident, then we account for them in loss of support calculations.

178.3. It is important to note that Disability/Income protection benefits are tax-free.

179. Compensation for Occupational Injuries and Diseases Act (COIDA)

179.1. If a person gets injured, contracts a disease or dies while working, they or their dependants can claim from the Compensation Fund. The Compensation Fund pays compensation to permanent and casual workers, trainees and apprentices who are injured or contract a disease in the course of their work and lose income as a result.

179.2. If an individual gets injured or dies while on duty as a result of a motor vehicle accident, the capitalised value of the COIDA pension is accounted for as a deduction from the LoE. The capitalised value is deducted after the application of merits apportionment and the CAP.

180. Commuting Journey Policy (CJP) - Rand Mutual Assurance

181. CJP enhances employee protection by providing cover if an employee dies or becomes disabled as a result of an accidental injury which occurred while:

181.1. Journeying between home and work on a reasonable, direct route.

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181.2. Travelling to and from company sanctioned events such as Sports, Memorial Services and Funerals.

182. If an individual gets injured or dies while commuting to or from work as a result of a motor vehicle accident, the capitalised value of the CJP pension is accounted for as a deduction from the loss of earnings or loss of support. The capitalised value is deducted after the application of merits apportionment and the RAF CAP.

MACROS USED IN THE MODEL

183. Below is a refined description of the macros within the model:

184. LoE Form:

184.1. A user-friendly form designed to facilitate the input of necessary information for the report. This includes:

184.2. Actuarial and Regional staff involved in the case.

184.3. Link and reference numbers for tracking purposes.

184.4. Details of the injured party and date of the accident.

184.5. Details of Plaintiff and Defendant Industrial Psychologist and joint minutes.

185. Result generation macro:

186. This macro consolidates outcomes from various scenarios onto a single worksheet named "Results". To ensure that the pasted values are kept up to date with the latest inputs and calculations, the macro allows for refreshing of results.

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187. Report creation macro:

187.1. This macro populates a report with essential details derived from the calculations, encompassing:

187.2. Actuarial and Regional staff involved in the case.

187.3. Link and reference numbers for tracking purposes.

187.4. Details of the injured party and date of the accident.

187.5. Details of Plaintiff and Defendant Industrial Psychologist and joint minutes.

187.6. Contingency deductions

187.7. Details of the CAP (if applicable)

187.8. Computed results.

188. These functionalities are designed to enhance the efficiency and accuracy of data entry, result generation, and report creation within the model, particularly in the assessment of LoE scenarios.

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CURRENT PRACTICE

189. The current practice followed by the RAF in the calculation of the LoE is to estimate the loss of earnings in the future as a result of the accident.

$$LoE_{age}^{WPI} = f(IP)_{age} - f(IP)_{age}^{WPI}$$

where

$age = Age\ of individual\ on\ day\ of\ accident.$

$WPI = Post\ accident\ WPI.$

LoE_{age}^{WPI}
$= Expected\ Present\ value\ of\ a\ loss\ of\ pojected\ earnings\ until\ ERA\ of\ an\ indidual\ who\ suffered\ injuries$
$with\ an\ incremetal\ WPI\ of\ \alpha\ resulting\ from\ a\ South\ African\ Road\ accident.$

$ERA = Expected\ Retirement\ Age.$

$f(IP)_{age}$
$= Expected\ Present\ value\ of\ future\ earning\ projected\ until\ ERA\ from\ the\ IP\ report\ of\ an\ individual\ aged\ x$

$f(IP)_{age}^{WPI}$
$= Expected\ Present\ value\ of\ future\ earning\ projected\ until\ ERA\ from\ the\ IP\ report\ of\ an\ individual\ aged\ x$
$with\ WPI\ of \alpha\ after\ suffering\ certaing\ injuries\ resulting\ from\ a\ South\ African\ road\ acciden$

Figure 19: Current practice LoE formula

190. This formula requires the RAF to consider the claimant's current earnings as well as future expected earnings prior to the accident and post the accident.

191. The amount that the RAF estimates as a claim is the difference between the pre- and post-accident earnings.

192. Due to the uncertainty related to future earnings, which are attached to future job grades changes as well as regular salary/wage increases (and annual bonuses) to keep pace with inflation, it is inevitable that there are various postulations and assumptions made in projecting future earnings.

193. The uncertainty of these postulations and assumptions increases when considering post-accident projections as there are difficulties in assessing the level of impairment and also functional capability into the future.

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194. Pre-accident earnings:

194.1. For the pre-accident calculations, there is a need to consider a standard path of earnings progressions for the claimant.

194.2. For cases where the claimant is employed in the formal sector, this estimation of future earnings can be quite complex and difficult to estimate objectively given the uncertainty associated with individual progression paths at work.

194.3. In cases where the claimant is employed in the informal sector or self-employed, it is more challenging to accurately estimate the current earnings as well as future earnings.

194.4. For minors and claimants yet to enter the workplace, the expected earnings at the expected start of employment are difficult to objectively estimate. Similar challenges around future earnings are also present for this group of individuals.

195. Post-accident earnings:

195.1. Similar challenges to the above are encountered here.

195.2. In addition, there are major challenges regarding the expected earnings potential for the impaired lives as there is limited objective evidence of the propensity of the claimants to shift from their occupation to any occupation for which the claimant might be qualified or capable of performing.

195.3. Furthermore, the actuarial assumptions for this calculation require mortality adjustments to account for the impairments due to the accident.

196. The problem of uncertainty, expert judgements, and subjectivity:

196.1. The RAF seeks to standardise the formula for the calculation of both the Loss of Earnings and Loss of Support to achieve equity among the claimants.

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196.2. Standard formulae for calculating compensation amount are necessary since the Fund is financed in a standard manner through collecting a fixed amount based on a litre of fuel across all South African motorists.

PROPOSED SOLUTION

Classification of claimants into cohorts

197. The principle driving the proposed solution is to ensure as much objectivity as possible. This entails the use of statistical evidence as much as possible to estimate for earnings at the start of normal employment as well as the potential for future earnings.

198. Just as any social benefit scheme provides equitable benefits to its beneficiaries, it is necessary for RAF to provide equitable compensation to all its beneficiaries.

199. Equitable compensation implies that all users of South African roads can expect equal compensation for equal loss in expected future earnings.

200. Given the funding model for the RAF is based on the fuel levy, which is charged on a flat rate basis (i.e., the rate is set per litre of fuel purchased and does not consider socio-economic status, or any other factors), it makes sense to consider a payout that is standard across the spectrum of claimants.

201. The solution proposes that the RAF consider an approach that first classifies claimants for Loss of Earnings into three cohorts, as follows.

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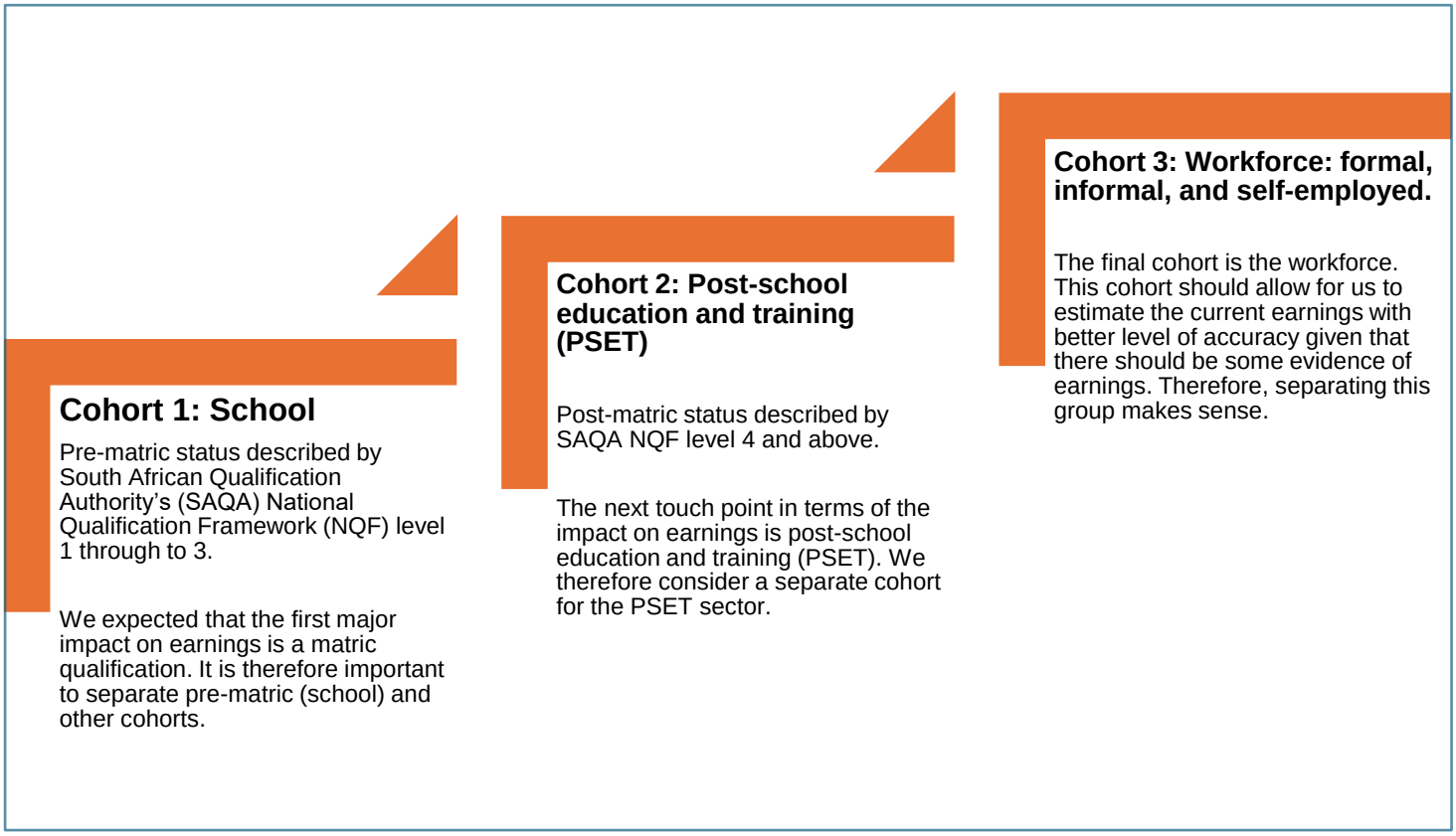

Figure 20: Life stage cohort categories

202. Once the cohorts have been defined, it is essential to consider the other elements of the earnings projection, i.e., earnings (both current and future), as well as life expectancy.

Occupational classifications

203. In the projections of pre-accident and post-accident earnings, it is necessary to input a current earnings figure. This figure will likely differ between different cohorts. The earnings will depend on the claimant's qualifications and experience.

204. The RAF proposes a solution proposes that adopts an industry or occupation classification system that will enable the model to estimate the likely earnings for individuals (both current earnings and future earnings). Only specific industries with evidence of actual salaries or wages will be considered.

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205. Where industries are fairly homogenous, that is, similar in terms of salaries and earnings progression, such industries will be grouped together.

206. The RAF proposes that the industry classifications are balanced, that is, representative while not being too many to ensure that the model can capture the earnings potential in an accurate way but remain simple.

207. The COIDA industry and occupation list below provides a list to be considered for for the proposed solution. Below the are industries in consideration:

Table 11: Occupation classification

Class	Description
I	Agriculture, Forestry, etc.
III	Fishing, etc.
IV	Mining, Quarrying, Sand Pits, etc.
V	Building Construction, etc.
VI	Foods, Drinks, Tobacco, etc.
VII	Textiles, etc.
VIII	Wood Industry, Upholstery, etc.
IX	Printing And Paper Industry, etc.
X	Chemical Industries, Rubber, Oil, Paint, etc.
XI	Leather Industry, etc.
XII	Glass, Bricks, Tiles, Concrete, etc.
XIII	Iron, Steel, Artificial Limbs, Galvanizing, Garages, Metals, etc.
XIV	Jewellers, Diamonds, Asbestos, Bitumen, etc.
XV	Trade, Commerce, etc.
XVI	Banking, Insurance, etc.
XVII	Air, Road Transport Hauliers, etc.
XVIII	Local Authorities, Divisional Councils, Power Stations, etc.
XIX	Personal Services, Hotels, Flats, etc.
XX	Entertainment, Sport, etc.
XXI	Medical Services, Animal Hospitals, etc.
XXII	Professional Services, etc.
XXIII	Educational Services, etc.

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208. We expect to have sub-categories for some of the industries above to allow for the impact of injury on physical and non-physical jobs. This refinement is designed to offer a more intricate comprehension of the ramifications of injuries within each sector of industry.

209. Projected earnings (where there is missing evidence, e.g., for minors) will be allowed for at an average industry/occupation level for the claimant and not at an individual level.

Current earnings

210. During pre-accident and post-accident earnings projections, it is necessary to input a current earnings figure. This figure will likely differ between different cohorts. The earnings will depend on the claimant's qualifications and experience.

211. Pre-accident current earnings will be actual earnings where the is objective evidence in support of the actual earnings.

212. Where the claimant is not yet employed, average earnings for all or specifically chosen industries will be considered.

Projected future earnings

213. The model sums past and future losses.

214. For past losses, prevailing information will be used to set value of earnings in the model.

215. For future loses, earnings will be estimated using current earnings where they are available. Otherwise, current earnings will be estimated using average industry earnings taking impairment into account (for post-accident computations).

216. The RAF proposes that the model considers inflationary (CPI) and promotional increases until retirement.

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217. A similar model is proposed for prior-accident and post-accident. However for post-accident projections, the model needs to allow for the severity of impairment.

218. The RAF proposes that the WPI (injury severity tiers) are used as an input into the calculation of the probabilities for post-accident earnings.

219. Given the cohorts defined above, we expand below on the details for each cohort.

Cohort 1: School

220. The figure below shows various possible paths for an individual who is still in the schooling system until they start earning in one of the pre-identified employment industries.

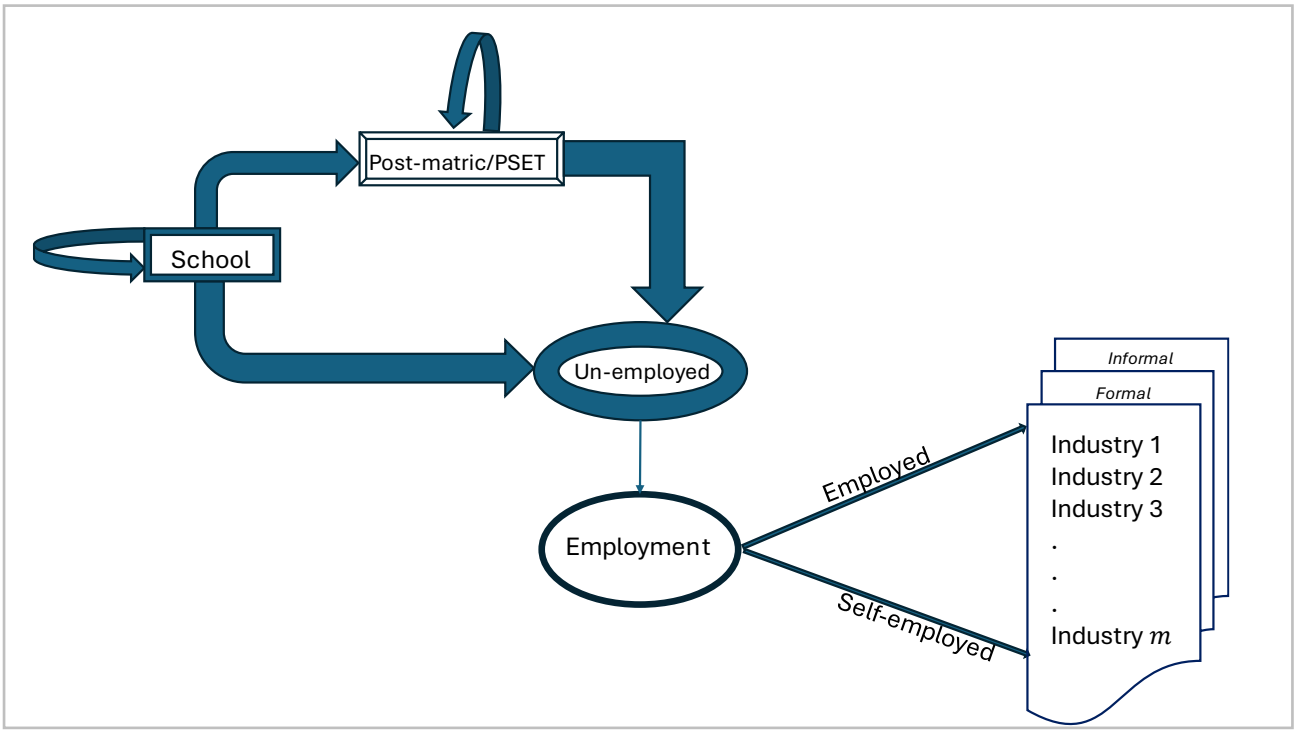

Figure 21: Cohort 1 – School

221. The model will consider the average earnings at the employment entry age for this cohort, i.e., when the claimant was expected to start earning an income.

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$$E\left[\boldsymbol{LoE}_{age}^{WPI}\right] = \sum_{work\_year=1}^{ERA}\left[\sum_{j=1}^{n} e_j \times \ \boldsymbol{Pr}_j(future\ employment|school) \times \ {}_{work\_year}\boldsymbol{Pr}_{age} - \sum_{work\_year=1}^{n} e_j^{WPI} \times \ \boldsymbol{Pr}_j^{WPI}(future\ employment|school) \times work\_year\boldsymbol{Pr}_{age}^{WPI}\right]$$

Figure 22: Cohort 1 formula

Where,

$E\left[\boldsymbol{LoE}_{age}^{WPI}\right]$=Expected Loss of Earnings due to accident that occurred at age and resulted in injuries of WPI.

age=Age at which accident happened.

$work\_year$= Year of working, measured from date of accident.

ERA=Expected Retirement Age.

$\sum_{work\_year}^{ERA} x$=Sum of values of x for all years of working until ERA.

$PV\ (x)$=Present value of values of x.

e_j=Pre-accident average earnings in industry j.

e_j^{WPI}=Post-accident average earnings in industry j.

${}_{work\_year}\boldsymbol{Pr}_{age}$=Probability of surviving a period of $work\_year$ for an individual aged age.

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$_{work\_year}\boldsymbol{Pr}_{age}^{WPI}$=Transitional probability of an individual aged age to survive $work\_year$ with a given WPI.

$\boldsymbol{Pr}_j(future\ employment|school)$=Pre-accident probability of employment in j industry given an individual is still at school on day of accident.

$\boldsymbol{Pr}_j^{WPI}(future\ employment|school)$= Post-accident probability of employment in j industry given an individual is still at school on day of accident.

222. To ensure an objective and equitable calculation, we propose that the projected earnings follow the general prospects of the average South African School student based on statistical evidence as much as possible.

223. This entails tracking the cohort 1 claimant and estimating the point at which they enter the workforce as depicted in figure above.

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Cohort 1A: individuals that fail to matriculate.

224. A proportion of the school cohort might not matriculate and enter the workforce at the point they exit the school system. The path model for this sub-cohort is given below.

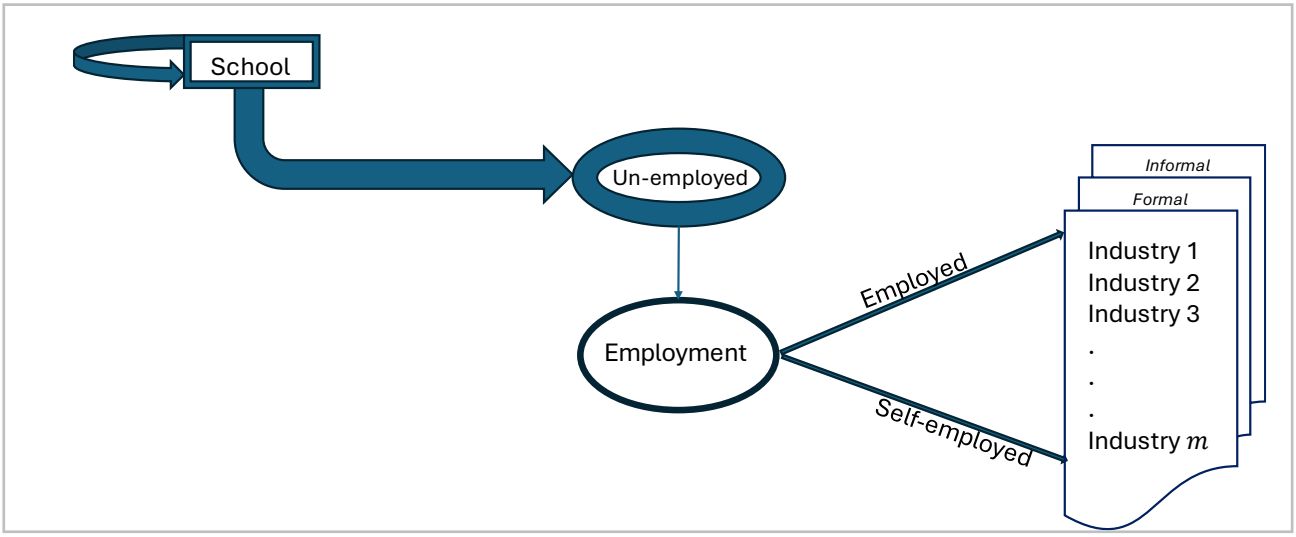

Figure 23: Cohort 1A – Individuals that fail to matriculate

225. The model will need to estimate the likelihood of failure to matriculate, i.e., failing to obtain a Matric certificate (for whatever reason). Based on desktop research, it is reasonable to expect that the Department of Basic Education (DBE) and/or Statistics South Africa (Stats SA) might be able to provide this information.

226. The model will then estimate the probability of the individual who fails to matriculate securing employment into one of the industry classifications considered.

227. Earnings can be estimated based on average earnings for that industry classification. The RAF will utilise information from credible sources to assist in estimating the average earnings per industry category for an individual who doesn't have a matric certificate.

Cohort 1B: individuals that matriculate and enter the workforce.

228. A proportion of the school cohort will matriculate and choose to enter the workforce.

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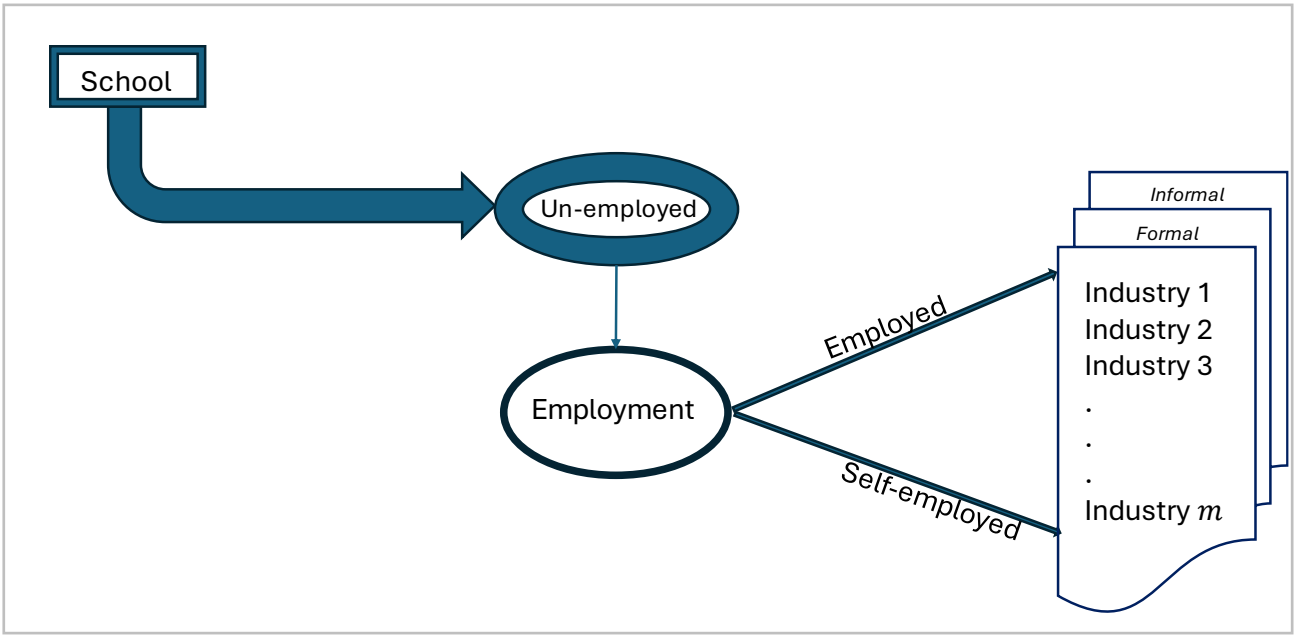

Figure 24: Cohort 1B – Individuals that matriculate and enter the workforce

229. The model will need to estimate the likelihood of graduating matric, i.e., obtaining a matric certificate with the appropriate grades to enter the workforce.

230. For this sub-cohort, the model will then estimate the probability of the individual obtaining a matric certificate securing employment into one of the industry classifications considered.

231. The earnings can be estimated based on average earnings for that industry classification.

232. The RAF will use relevant data sources to assist in estimating the average earnings per industry category for an individual who has a matric certificate.

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Cohort 1C: individuals that matriculate and continue to PSET.

233. The remaining proportion of the school cohort will matriculate and continue to the PSET sector.

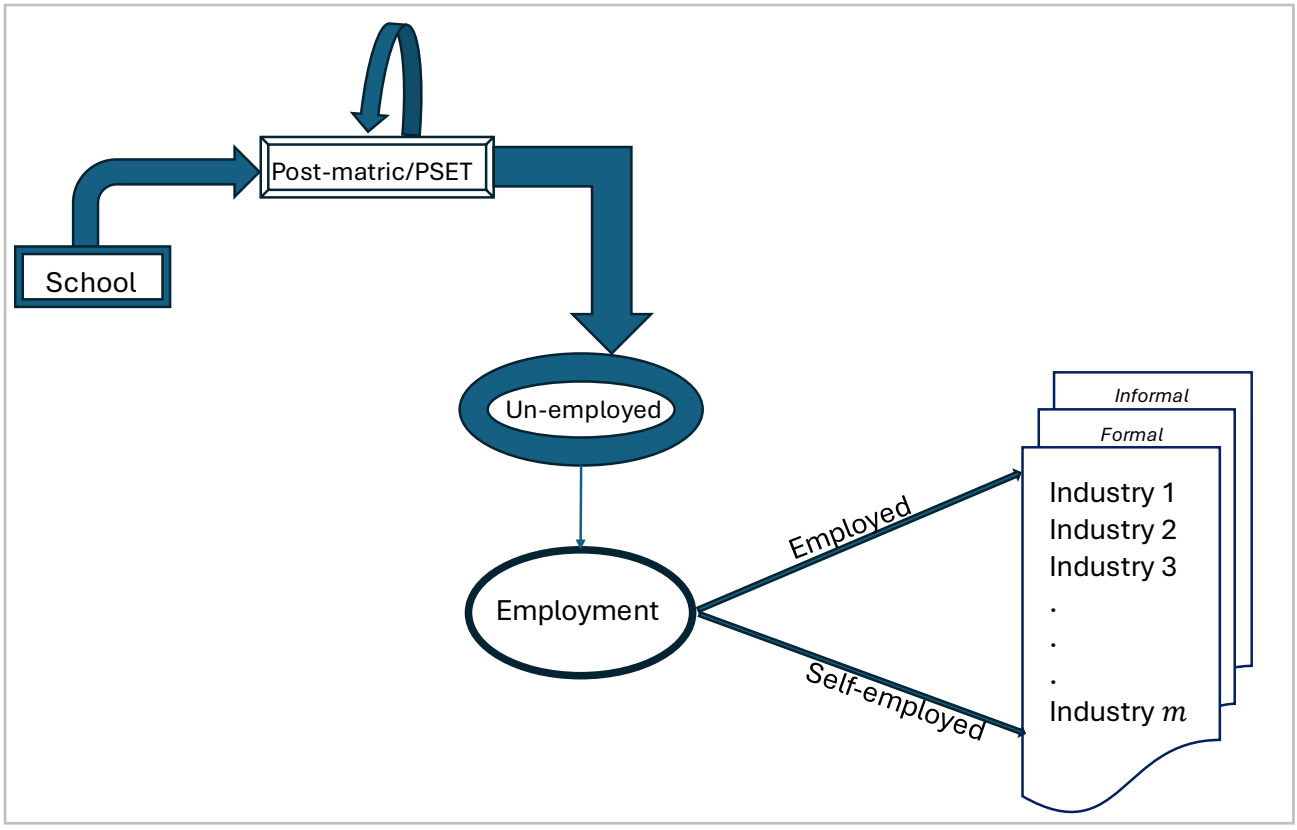

Figure 24: Cohort 1A – Individuals that matriculate and continue to PSET

234. The model will need to estimate the likelihood of graduating matric, i.e., obtaining a matric certificate with the appropriate grades to enter the PSET.

235. For this sub-cohort, the model will then follow the methods outlined below for the PSET cohort.

Cohort 2: Post school education and training (PSET)

236. The figure below shows various possible paths for an individual who is still in the PSET system until they start earning an income.

237. These individuals can graduate PSET or fail to graduate PSET during record time (and hence can always repeat certain years or subjects).

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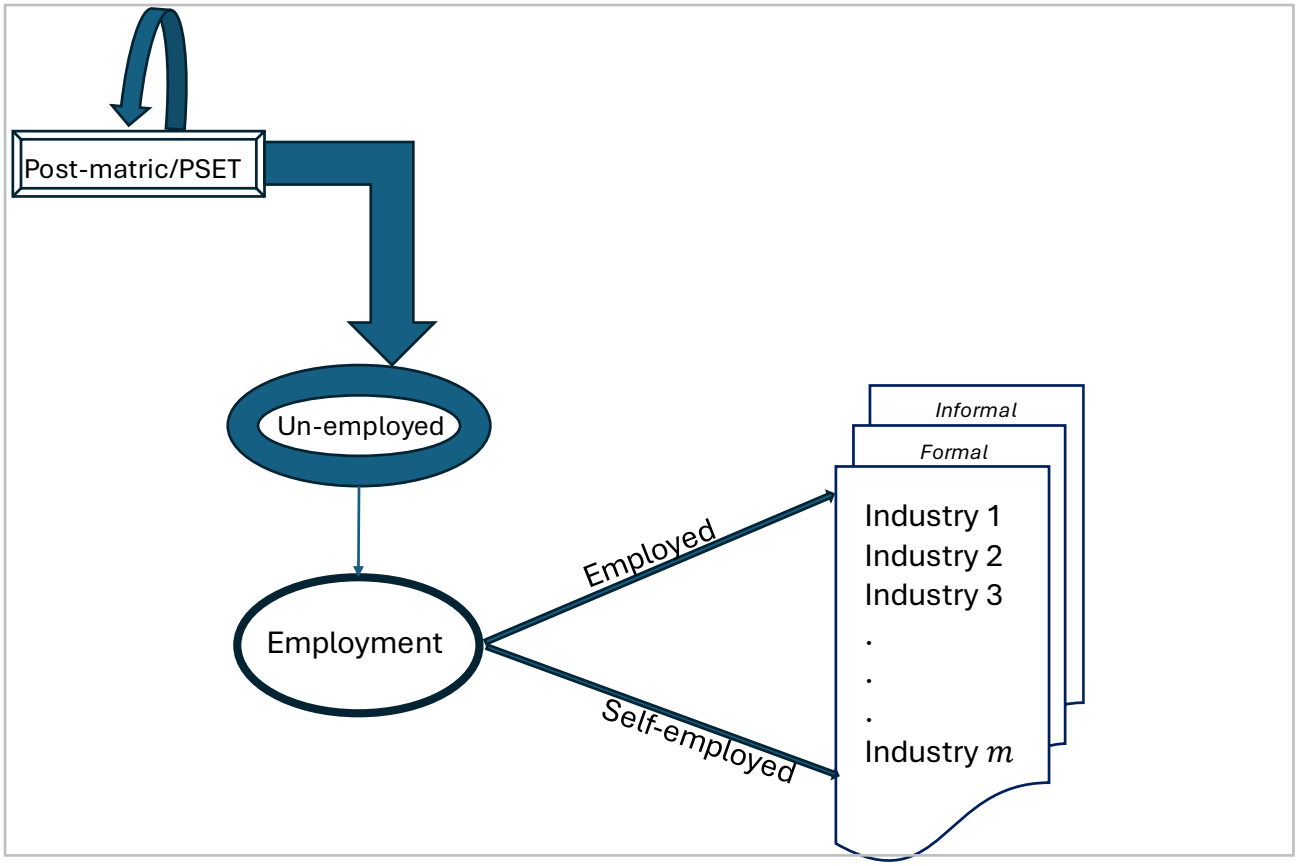

Figure 25: Cohort 2 Post education and training

$$E\left[\boldsymbol{LoE}_{age}^{WPI}\right] = \sum_{work\_year=1}^{ERA}\left[\sum_{j=1}^{n} e_j \times \ \boldsymbol{Pr}_j(future\ employment|PSET) \times \ {}_{work\_year}\boldsymbol{Pr}_{age} - \sum_{work\_year=1}^{n} e_j^{WPI} \times \ \boldsymbol{Pr}_j^{WPI}(future\ employment|school) \times work\_year\boldsymbol{Pr}_{age}^{WPI}\right]$$

Figure 26: Formula for Cohort 2

Where,

$E\left[\boldsymbol{LoE}_{age}^{WPI}\right]$=Expected Loss of Earnings due to accident that occurred at age and resulted in injuries of WPI.

age=Age at which accident happened.

$work\_year$= Year of working, measured from date of accident.

`

ERA=Expected Retirement Age.

$\sum_{work\_year}^{ERA} x$=Sum of values of x for all years of working until ERA.

$PV\ (x)$=Present value of values of x.

e_j=Pre-accident average earnings in industry j.

e_j^{WPI}=Post-accident average earnings in industry j.

${}_{work\_year}\boldsymbol{Pr}_{age}$=Probability of surviving a period of $work\_year$ for an individual aged age.

${}_{work\_year}\boldsymbol{Pr}_{age}^{WPI}$=Transitional probability of an individual aged age to survive $work\_year$ with a given WPI.

$\boldsymbol{Pr}_j(future\ employment|school)$=Pre-accident probability of employment in j industry given an individual is still at PSET on day of accident.

$\boldsymbol{Pr}_j^{WPI}(future\ employment|school)$= Post-accident probability of employment in j industry given an individual is still at PSET on day of accident.

238. The model will consider the likely earnings at the employment entry age for this cohort, i.e., when the claimant was expected to start earning an income.

239. To ensure an objective and equitable calculation, we propose that the projected earnings follow the general prospects of the average South African PSET student based on statistical evidence as much as possible.

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240. This entails tracking the cohort 2 claimant and estimating the point at which they enter the workforce as depicted in figure 2 above.

241. As shown in figure above, there are various possible paths for an individual who is still in the PSET system.

Cohort 2A: individuals that fail to graduate PSET.

242. A proportion of this cohort might not graduate from PSET and enter the workforce at the point they exit the PSET system. The path diagram for this sub-cohort is shown below.

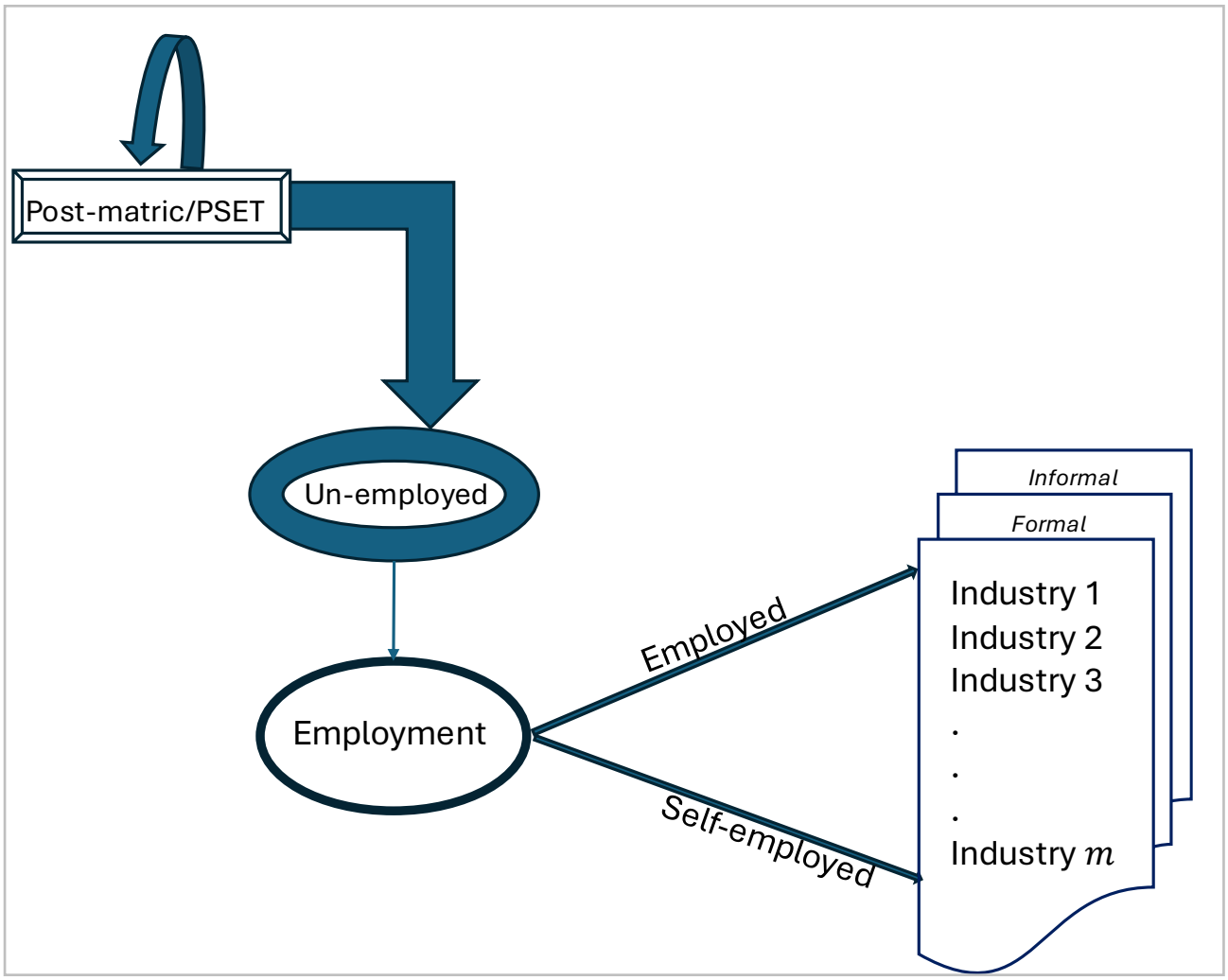

Figure 27: Cohort 2A – Individuals that fail to graduate PSET

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243. The arrow emanating and feeding back into the “Post-matric/PSET” state indicates the possibility that the individual can repeat certain years or subject in order to finally obtain the degree.

244. The model will need to estimate the likelihood of failure to graduate from college/university (for whatever reason).

245. For this sub-cohort, the model will then estimate the probability of the individual who fails to graduate college/university (but can potentially still go back and finish off years later) securing employment into one of the industry classifications considered to be associated with their choice of study at PSET.

246. Once the expected industry is identified based on their PSET studies, then earnings can be estimated based on average earnings for that industry classification.

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Cohort 2B: individuals that graduate PSET.

247. A proportion of the PSET cohort will graduate from PSET and enter the workforce at the point they exit the PSET system. The diagram below shows their possible path.

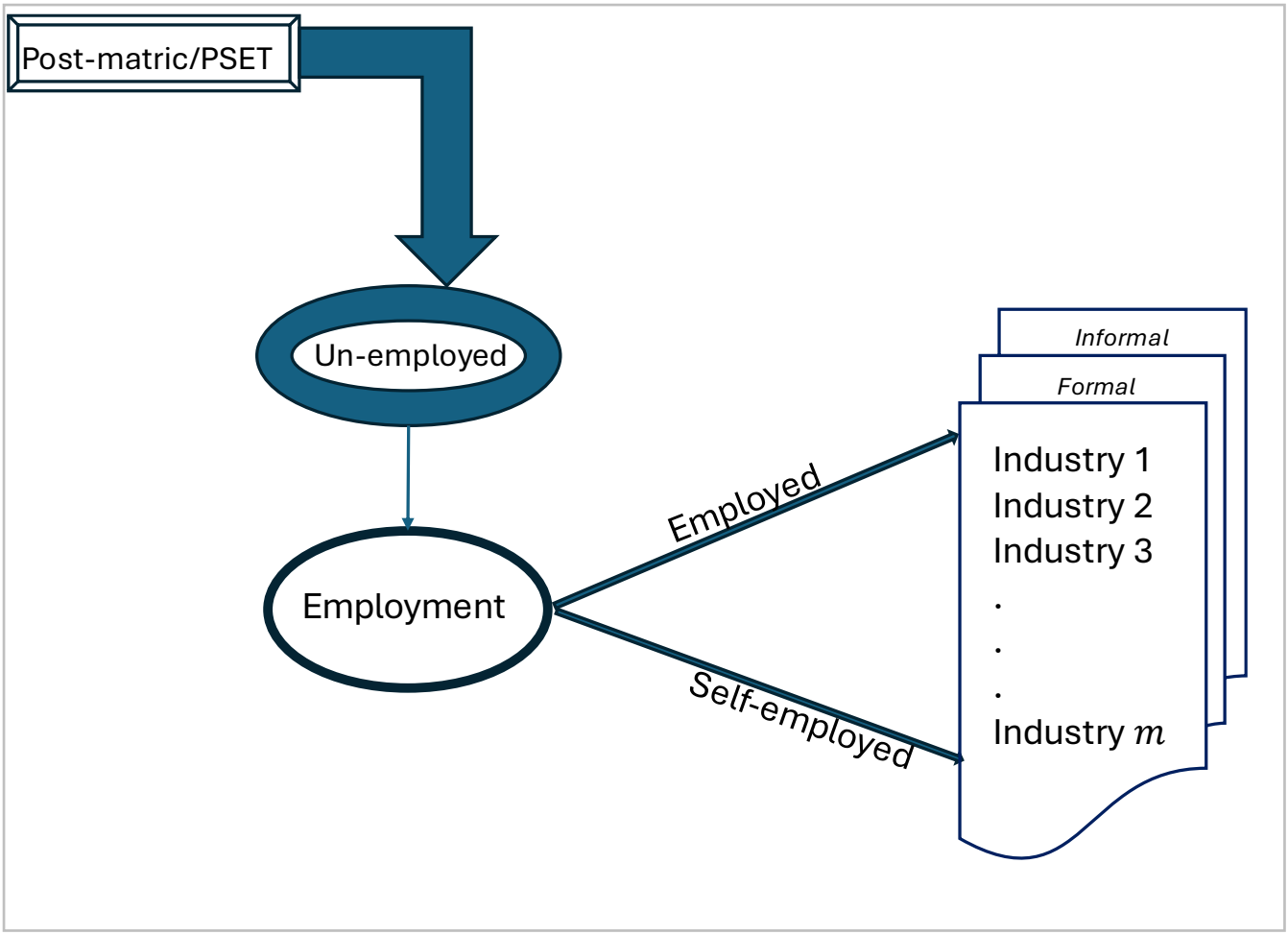

Figure 28: Cohort 2B – Individuals that graduate PSET

248. The model will need to estimate the likelihood of graduating from college/university given their choice of study.

249. For this sub-cohort, the model will then estimate the probability of the individual who graduates college/university securing employment into one of the industry classifications considered based on the graduate choice of study.

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250. Once the expected industry is identified-based on the graduate choice of study, then earnings can be estimated based on average earnings for that industry classification.

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Cohort 3: Workforce

251. The figure below shows various possible paths for an individual who is employed/unemployed until they start earning in one of the pre-identified employment industries.

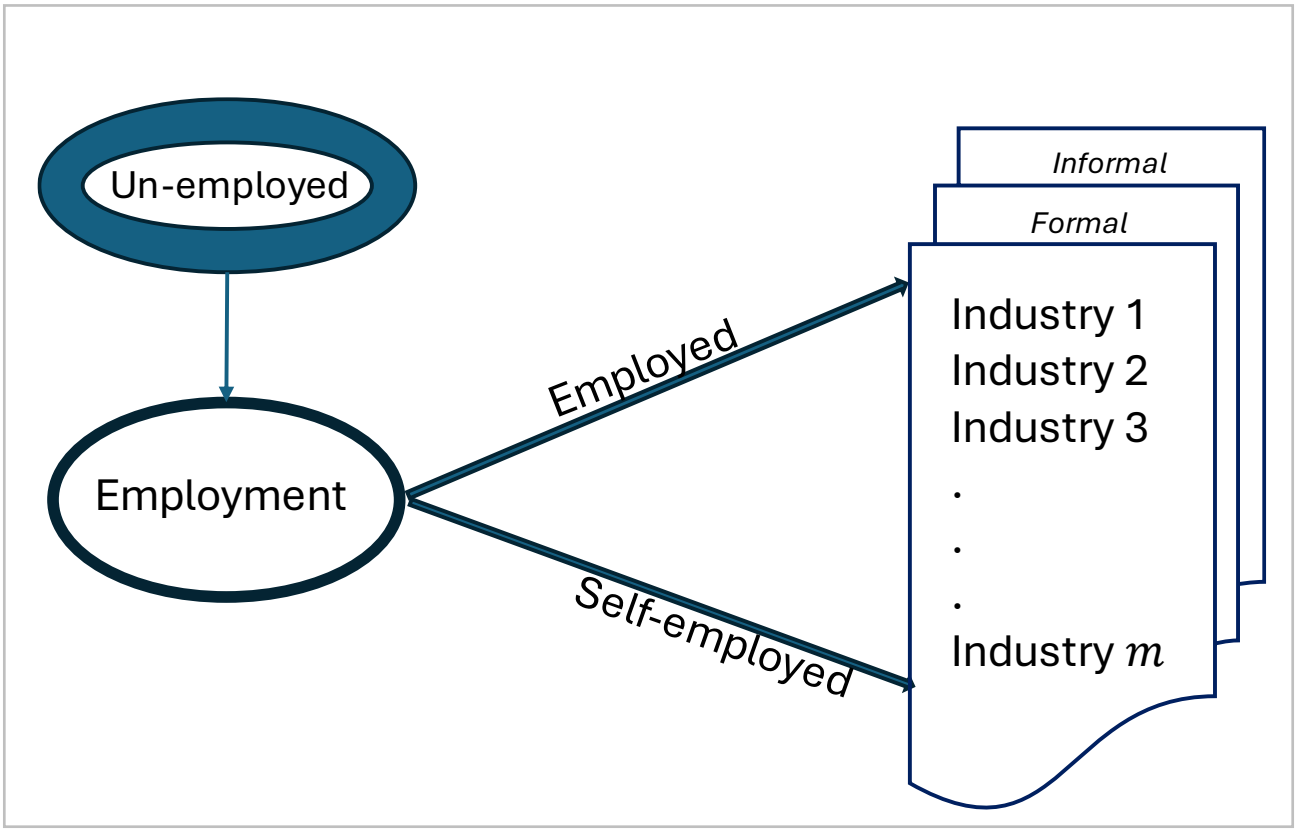

Figure 29: Cohort 3 Workforce

252. The model will consider the current earnings for this cohort. For individuals not yet employed, average earnings for industry relevant to them will be considered. The relevance of the industry depends on previous studies of an individual.

$$E\left[\boldsymbol{LoE}_{age}^{WPI}\right] = \sum_{work\_year=1}^{ERA}\left[\sum_{j=1}^{n} e_j \times \boldsymbol{Pr}_j(pre-accident\ employment) \times {}_{work\_year}\boldsymbol{Pr}_{age} - \sum_{work\_year=1}^{n} e_j^{WPI} \times \boldsymbol{Pr}_j^{WPI}(post-accident\ employment) \times work\_year\boldsymbol{Pr}_{age}^{WPI}\right]$$

Figure 30: Formula for Workforce

`

Where,

$E\left[\boldsymbol{LoE}_{age}^{WPI}\right]$=Expected Loss of Earnings due to accident that occurred at age and resulted in injuries of WPI.

age=Age at which accident happened.

$work\_year$= Year of working, measured from date of accident.

ERA=Expected Retirement Age.

$\sum_{work\_year}^{ERA} x$=Sum of values of x for all years of working until ERA.

$PV\ (x)$=Present value of values of x.

e_j=Pre-accident average earnings in industry j.

e_j^{WPI}=Post-accident average earnings in industry j.

${}_{work\_year}\boldsymbol{Pr}_{age}$=Probability of surviving a period of $work\_year$ for an individual aged age.

${}_{work\_year}\boldsymbol{Pr}_{age}^{WPI}$=Transitional probability of an individual aged age to survive $work\_year$ with a given WPI.

$\boldsymbol{Pr}_j(Pre\ accident)$=Pre-accident probability of employment in j industry given an individual is unemployed.

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$\boldsymbol{Pr}_j^{WPI}(post\ employment)$= Post-accident probability of employment in j industry given an individual is unemployed.

Cohort 3A: Formally employed individuals:

253. For these individuals, it may be possible to obtain a payslip as evidence of current earnings. Where this is not available, other forms of evidence, such as a contract of employment, will assist in confirming the current earnings.

Cohort 3B: Informally employed individuals:

254. This may be difficult to ascertain as the income may be irregular.

255. It may be estimated as an average income for the past six months based on bank statements.

Cohort 3C: Self-employed individuals:

256. This might also be difficult to estimate. Similar approaches as considered for Cohort 3B might be useful.

257. Consider average earnings for the industry in which they belong.

Projected future earnings: pre-accident

258. The solution proposes that the model considers inflationary (CPI) and promotional increases until retirement.

Projected earnings: post-accident

259. The model sums past and future losses.

260. For past losses, prevailing information will be used to set value of earnings in the model.

`

261. For future loses, earnings will be estimated using current earnings as a base where this information is available. Otherwise, current earnings will be estimated using average industry earnings taking impairment into account.

262. We propose a similar model to the above. However, the model needs to allow for the severity of impairment for each of the above probability.

263. We propose that the WPI (injury severity tiers) are used as an input into the calculation of the probabilities for post-accident earnings.

Data and research requirements

264. We will make use of data and research on the following data points for example:

264.1. Graduation probabilities across the different NQF levels,

264.2. Employment probabilities by industry given qualifications,

264.3. Earnings potential for graduates' securing employment both pre- and post-accident.

265. Graduation probabilities and employment rates will be obtained from the Department of Education and Statistics South Africa.

266. Information on earnings potential, particularly for South Africa, will be based on the Quantum Yearbook estimates or from commercial job boards.

UNDERLYING ASSUMPTIONS

267. Cohort I

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267.1. Probability of an individual failing to matriculate, i.e., failing to secure a matric certificate (for whatever reason).

267.2. Probability of matric graduation with pass grade.

267.3. Probability of matric graduation with a diploma or bachelors.

267.4. Probability of securing work in a particular industry classification. This entails considering that the individual might enter any of the listed industries with a particular probability and then deciding on the expected industry based on the individual's qualifications.

267.5. Estimated earnings given that the individual secures work in a particular industry. This consideration is two-fold: (1) the earnings potential at the point of entry into the workplace, and (2) the estimated future earnings based on inflation and standard job grade changes.

268. Cohort 2

268.1. Probability of failing to finish college/university. This needs to consider the progress made in the PSET studies:

268.2. First year completed needs to be mapped to an NQF level to accurately assess the impact of this progress on the probability to enter a particular industry and the probability to secure employment.

268.3. Second year completed needs to be mapped to an NQF level to accurately assess the impact of this progress on the probability to enter a particular industry and the probability to secure employment.

268.4. Third year completed needs to be mapped to an NQF level to accurately assess the impact of this progress on the probability to enter a particular industry and the probability to secure employment.

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268.5. If the Programme of study is more than 4 years, then continue in this fashion until the $(n-1)^{th}$ year completed, where n is the full number of years to complete the Programme.

268.6. Probability of graduating college/university.

268.7. Probability of security work in a particular industry classification. This entails considering that the individual might enter any of the listed industries with a particular probability and then deciding on the expected industry based on the individual's qualifications.

268.8. Estimated earnings given that the individual secures work in a particular industry. This consideration is two-fold: (1) the earnings potential at the point of entry into the workplace, and (2) the estimated future earnings based on inflation and standard job grade changes.

269. Cohort 3

269.1. Where the individual does not have proof of income then it may be difficult to estimate this.

269.2. One approach to mitigate this would be to consider these individuals in a similar way to Cohort 1 or Cohort 2 and estimate the industry they are likely to enter, and their estimated earnings based on their qualifications and experience.

269.3. In this case, it will be necessary to estimate the following probabilities.

269.3.1. Probability of securing work in a particular industry classification. This entails considering that the individual might enter any of the listed industries with a particular probability and then deciding on the expected industry based on the individual's qualifications.

269.3.2. Estimated earnings given that the individual secures work in a particular industry. This consideration is two-fold: (1) the

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earnings potential at the point of entry into the workplace, and (2) the estimated future earnings based on inflation and standard job grade changes.

269.4. The likelihoods and amounts of post-accident earnings depend only on the demographics and educational variables of the victim at time of accident.

269.5. The victims' disability and mortality rates are affected only by injuries sustained during an accident.

269.6. There is a need to ensure that the injuries post-accident can be objectively diagnosed so that the WPI scales can be set up accurately.

269.7. The victims experience prevailing mortality and economic conditions in South Africa. This should be based on the actuarial life tables as described in this paper.

269.8. Post-accident, the actuarial life table will be adjusted to allow for the impairment. The adjustment factors need to be carefully researched to ensure that they are appropriate for each WPI category.

PROPOSED STANDARD FORMULAE FOR LOSS OF EARNINGS

270. This formula is summarised below:

Loss of Earnings = PV(Pre-Accident Earnings) - PV(Post-Accident Earnings)

Figure 31: Standard Formula for LoE

where:

- PV(Pre-Accident Earnings) represents the present value of the projected earnings the claimant would have received if the accident had not occurred. This projection incorporates adjustments for expected inflation, career progression, and any other relevant economic factors up to the ERA, discounted back to the present value using a suitable discount rate.

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- PV(Post-Accident Earnings) is the present value of the claimant's projected earnings considering the accident's impact. This takes into account any reduction in earning capacity due to the accident and allows for the level of severity of the injury, adjusted similarly for inflation and discounted back to present value.

271. The calculation of each present value component involves discounting future earnings streams to their present values, a process that accounts for the time value of money, ensuring a consistent basis for comparison. It's important to note that these projections and the subsequent discounting must factor in adjustments for mortality rates and any contingencies, including but not limited to death, changes in employment status, health, and economic conditions.

272. A claimant's gender also is an important consideration in the calculation, as this has an impact on one's life expectancy and the mortality rates used.

273. In the following section, details will be provided on how the earnings (being a key component of the quantification) are estimated in the proposed solution.

INPUTS AND ASSUMPTIONS TO BE USED IN DETERMINING LOSS OF EARNINGS

Demographic data

274. The demographic data will primarily be sourced from the RAF data system and supplemented with information from physical files, as may be needed.

Financial data inputs and assumptions

275. Inflation used in the calculation of LoE will be similar to the current RAF practice.

276. **A discount rate** is the rate used to determine the present value of a series of future cashflows. In the proposed solution, the discount rate used for this purpose is in line with current nominal and real bond rates obtainable from the Johannesburg Stock Exchange (JSE) or the Reserve Bank of South Africa (SARB)'s

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Prudential Authority as used for the Solvency and Assessment (SAM) process for insurance companies.

277. **Tax** that is assumed to be applied to the observed, past earnings of a claimant in performing a LoE calculation is in line with the personal income tax tables that are provided by the South African Revenue Service (SARS). For future earnings, the same tables are used with adjustments made for future inflation as outlined above. However, where the earnings of a claimant are from outside the jurisdiction of the Republic of South Africa, appropriate tax data may be sourced from the relevant country to serve the same function as the SARS tables.

278. It is possible that in some instances, a claimant may have for a period been the recipient of state disability grants. In the proposed solution, if such grant payments to the claimant commenced following the accident date, with qualification for the social grant being as a result of the motor vehicle accident in question, then the grants received are to be considered as income that the claimant received post-accident, until the cessation of such grant payments. Should grant payments still be taking place at the calculation date, then these will be assumed to cease following a reasonable period of time after the expected finalisation of the claim.

Mortality and impairment decrements

279. The age-based mortality tables that will be used are as earlier in this paper

280. Taking into account recommendations made in this report pertaining to a claimant's post-accident level of impairment, adjustments will be made to the life expectancy of a claimant by either making adjustments to mortality tables used via a percentage reduction, or by a given number of years.

Adjustments in light of contingencies, merits apportionment and the Cap

281. While contingencies are acknowledged as being the prerogative of legal teams / the Court involved, in the proposed solution for LoE these are in line with the current practice of the RAF i.e., 15% for pre-accident and 25% for post-accident earnings.

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282. The proposed LoE solution will still make allowance for adjustments to the claim amount calculated to take account of a victim's allocated percentage of responsibility for the motor vehicle accident. For example, a merits apportionment of 80% in favour of the injured (or 20% against the injured) means that the injured is only entitled to 80% of the claim.

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CHAPTER 5: LOSS OF SUPPORT (LOS)

CURRENT LANDSCAPE

283. The current practice of calculating LoS benefits is based on a pre-defined proportion of the deceased's loss of earnings.

284. The proportion depends on whether the surviving dependent is a spouse, child or other qualifying dependant.

CHALLENGES WITH CURRENT LANDSCAPE

285. The current method does not consider the possibility of spousal divorce and therefore eliminating the need for spousal support in the future.

286. The current methodologies also do not consider the possibility of a spouse remarrying.

287. Experts report that are relied on sometimes for LoS matters are out of date e.g., an industrial psychologist's report from 2019 may be the only one available for use in a calculation in 2024, resulting in an actuarial report that may not accurately reflect the claimant's current status.

288. Scanned documentation from time to time is not legible or may be missing some information, leading to delays in the finalisation of claims.

289. The income of self-employed individual may not always be simple to verify.

290. Tax return information may often not be available in order to verify a claimant's true income.

291. No payslips to verify earnings, thus an actuarial report based on reported earnings, which may be inaccurate.

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THE ACTUARIAL MODEL AND ASSUMPTIONS FOR LOS CLAIMS

292. In LoS matters, the objective is to quantify the financial loss experienced by the dependents of a deceased individual who dies due to a motor vehicle accident.

293. Dependents that are eligible for support in LoS matters are listed below:

293.1. **Spouses or life partner** – Surviving spouses and life partner are eligible to claim for loss of support for life;

293.2. **Children** – Surviving children are eligible to claim for loss of support until the age at which their dependency is expected to cease. Unless instructed otherwise, this is assumed to be at the ages of 18 or 21. In the case of a (mentally or physically) disabled child, however, dependency is assumed for life.

293.3. **Parents** – Indigent surviving parents are eligible to claim for loss of support if they are able to demonstrate that they were receiving financial assistance from the deceased at the time of death and that they are indigent. Once the indigent parent begins receiving the state old age pension, any support received from the deceased should be utilised only to complement the state pension. This ensures that the indigent parent maintains the same standard of living as when the deceased was alive.

293.4. **Surviving siblings** – Surviving siblings are eligible to claim for loss of support if they can demonstrate that they were receiving financial assistance from the deceased at the time of death. It's important to note that support between healthy siblings typically ceases at age 21.

293.5. **Divorced spouse** – Divorced spouses are eligible to claim for loss of support if a maintenance order was included as part of the divorce agreement.

294. In some cases, a directive is given for the existence of a notional child to be considered. This refers to a hypothetical child that the deceased might have had in the future. This measure is taken to prevent overestimating the loss of support for the surviving dependents, particularly when the deceased was young. If the deceased had

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additional children in the future, this would have impacted the shares of the surviving dependents.

295. When instructed to account for a notional child, the date of birth of such a child is required for the calculation. If the date of birth is not provided, it is assumed that the child would have been born within two years from the date of the deceased's death.

296. When instructed to allow for a notional child, the child's date of birth is required. When the date of birth of the notional child is not provided, the RAF assumes that the child would have been born within two years from date of death.

297. In instances where there is suspicion regarding the deceased potentially having a child, but no specific details are available, instructions may be received for such a child to be considered as a notional child. This measure is implemented to prevent overestimation of losses. In this instance however, the loss attributable to this child is not shown in the final tabulation of the results of the total loss quantified.

298. When the actual financial support is not known, it is normally assumed that the family income is apportioned as follows:

298.1. **Two shares each to the deceased and spouse** (income first being applied). If the deceased had more than one spouse, we apportion the two shares amongst the spouses/life partners equally,

298.2. **One share to each child/sibling,** while dependent

298.3. **One share to each indigent parent**

299. If the specific level of support provided to the dependents is known, such as through a maintenance arrangement, this fixed level of support for these dependents is factored in before the remaining income is distributed among other dependents.

300. To obtain the LoS, for each month after the date of death, the RAF apportions the net projected family or household income (after tax). The present value of each dependant's loss of support is calculated by discounting his/her apportionment of the

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deceased income, allowing for interest and the probability of survival of the deceased, widow and/or the parent/s. No interest is applied on past losses.

301. There may be cases where the surviving spouse only starts working after the accident. The surviving spouse's income is ignored in this case. However, if the surviving spouse intended to start working even when the deceased was alive, then their income is accounted for in the calculation, in line with the case between **Peri-Urban Areas Health Board v Munarin Supra, J A Holmes.**

302. If the surviving spouse remarries after the accident, the RAF may need to account for this based on the income of the new spouse from date of remarriage. If the new spouse is unemployed, then the surviving spouse will continue to suffer a loss of support equal to their loss of support from the deceased. If the new spouse is employed and they earn more than the deceased, then the surviving spouse does not suffer a loss of support from the date of remarriage. If the new spouse is employed but they earn less than the deceased, then the surviving spouse's loss of support from the date of remarriage is the difference between their share of the deceased's income and their share of the new spouse's income.

303. Where remarriage has not yet taken place, it may also be necessary to apply remarriage contingencies to cater for the chance (or mitigate the risk) of remarriage based on the statistics on remarriage by race. Further details are available in **The Quantum Yearbook.**

304. In some instances, a child is killed in the same accident as the deceased. In this case, this child's share is ignored in the calculation of the loss of support, per **RAF v Monani 2009 (4) SA 327 (SCA)**. In the same way, if both parents die in the same accident and only one of them was employed at the time, then the RAF treats the unemployed parent in the same way as a child who would have passed in the accident, i.e. ignore their share.

305. However, if both parents die in the accident, calculations are to incorporate the shares of both the husband and wife as follows:

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306. The RAF firstly calculates the loss of support with the father as the deceased and the mother as the surviving spouse, with their income combined to form a household income. The household income is then apportioned as discussed in paragraph 67 to calculate the surviving dependants' loss of support.

307. Secondly, the RAF swaps the mother and the father so that the mother will now be the deceased and the father will be the spouse and then the loss of the dependants is calculated as above.

308. The total loss of support suffered by the dependants will equal the loss calculated in a. plus the loss calculated in b. above.

309. In the case where the deceased has dependants who are not part of his household (dependants that the spouse does not support e.g. parents and illegitimate children), then only the deceased's income is accounted for in assessing these dependants' loss of support. The loss of support for the dependants who were not part of the household is taken as their share of the deceased's income only but accounting for the shares of all the deceased's dependants.

310. The loss of the dependants who are part of the household is calculated by adding the spouse's income with the deceased's remaining income (after deducting support of the dependants that are not part of the household).

311. When taking into account retirement benefits in LoS matters, the preferred method used is the one outlined (i.e., assuming that the employee and employer's contributions are invested as one and only realised a retirement). This is the preferred methodology for LoS matters because:

311.1. It is more in line with actual, observed practice,

311.2. It ensures that only the dependants that are still dependent at retirement benefit from the retirement benefits, and

311.3. It does not ignore the contributions made up to the date of time.

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312. If the dependants of the deceased receive an inheritance as a result of the deceased's death, the dependants are said to have benefitted from the death as they may have received the inheritance at an earlier date than expected. The inheritance will need to be accounted for.

313. If the deceased and the surviving spouse were married in community of property, only 50% of the deceased's estate is accounted for. This is because the surviving spouse would have been entitled to the remaining 50% by virtue of being married in community of property.

314. However, If the deceased and the surviving spouse were married out of community of property, 100% of the deceased's estate is accounted for. If the nature of the marriage is not known, it is assumed by the RAF that that the marriage was in community of property.

315. Liquidation and Distribution Account (L&D) are structured to include assets, liabilities and a balance for distribution (total assets *less* total liabilities).

316. Assets encompass a range of possessions such as houses, cars, furniture, household contents, cash, insurance payouts, provident fund benefits, and similar holdings. Liabilities consist of various obligations including loans, Master's fees, Executor's remuneration, advertisement costs, debtors, maintenance expenses, and similar financial commitments.

317. For marriage in community of property, the RAF excludes the family home, furniture, household effects and the family car as well as the liabilities attached to these, on the assumption that the use of these did not increase as a result of the death. For marriage out of community of property the RAF accounts for all of the above.

318. Proceeds of life insurance policies and pensions benefits in accordance with the Assessment of Damages Act 1969 are also excluded.

319. The balance of the estate (qualifying assets minus liabilities) is then accelerated and deducted from the loss of support.

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320. The deduction for inheritance comprises:

320.1. the actual amount inherited; plus

320.2. the value of using the inherited assets if the death had not happened; less

320.3. the value of the chance of inheriting the assets had the deceased lived out her/his normal lifespan.

321. For children, the RAF assumes that 100% of the inheritance is accelerated. Dependency is until 18 or 21 for children. Inheritance after that age does not constitute support to the children.

322. For LoS matters, contingencies are applied as follows, unless instructed otherwise:

Table12: LoS contingencies

	Past Loss	Future Loss
Spouse	5%	15%
Children	5%	15%
Parents	5%	20%

323. A loss of support is calculated from the date of death until the dependents achieve independence or until the deceased would have retired, if earlier. The objective is to compensate the dependents in a manner that restores their financial situation and maintains the same standard of living they would have had if the accident had not occurred.

324. The loss is split into ‘past’ loss and ‘future’ loss. Past refers to the period between the date of accident and the date of on which the calculation is performed, whereas future refers to the period from the date of calculation onwards.

325. The calculation model currently employed by the RAF for the determination of loss values in LoS claims is based in Microsoft Excel.

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326. Inputs into the model are obtained from the claim file that is provided to the RAF actuarial claims administrator by claims officers in RAF's regional offices. These inputs include the following information for LoS matters:

326.1. Names, date of birth and date of death of the deceased (verified via death certificate),

326.2. Names and dates of birth of the dependants (verified via copies of identity document and birth certificates),

326.3. Age or year in which dependency for any child dependants will cease,

326.4. Marriage certificate and/or lobola letter,

326.5. Spouse's income, if employed,

326.6. Adoption papers, if a child was adopted,

326.7. Proof of income for the deceased (payslips / employer certificate / affidavit / forensic report),

326.8. Proof of income for the spouse (payslips / employer certificate / affidavit),

326.9. Liquidation & Distribution Account,

326.10. Confirmation of compensation Fund benefits,

326.11. Maintenance order, where applicable (divorced spouse),

326.12. Industrial Psychologist report, where there is further postulation of the incomes of the deceased and/or the spouse,

326.13. Claims Assessor's report, and

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326.14. Where applicable, the income of the new spouse's income (in the case where the surviving spouse remarries)

327. It is important to note that losses may extend beyond the date of retirement if the deceased was entitled to post-retirement benefits.

328. For dates on or before the 20th day of the month, the calculation date is taken as the first day of the following month. After the 20th, it is taken as the first day of the second month after the current one.

329. As it pertains to earnings that are used in the calculations, to calculate the past loss, the loss after tax is estimated for each year in the past, from the date of the accident to the date of the calculation. The loss for each year is expressed in the actual monetary value relevant for that specific year. These past losses are then summed up to provide a total past loss amount. Under current RAF regulations, no additional interest is applied when summing up past losses. Additionally, for LoS matters the mortality of the deceased in the past is taken into consideration.

The analysis of income for LoS matters

330. A wide range of income categories are considered for the calculation of loss of support and loss of earnings. These include those listed below.

331. Salary/Wages

331.1. This pertains to the consistent income earned by individuals through employment under an institution or individual. The gross salaries of employees are typically documented in various forms such as payslips, salary advice notes, employer's certificates or certificates of employment, IRP5 or employee's tax certificates, employment contracts, and similar documents.

331.2. Employment benefits may include basic salary / wages, medical aid subsidies, bonuses, overtime pay, retirement funding and allowances such as those for housing, phone or transport – which are all subject to personal income tax as per rules of the South African Revenue Service (SARS). When only one payslip

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is available, the RAF's best practice is to use the year-to-date taxable earnings shown to estimate the annual income.

331.3. The team assumes that the approximately 50% of allowances are consumed for personal use e.g., cell phone allowance and transport allowance. In cases where allowances are specified, the RAF only accounts for 50% of the benefits in both LoE and LoS calculations.

331.4. The net salary after the tax deduction is used in loss of earnings and loss of support calculations.

332. Net Profit

332.1. This refers to the earnings of self-employed individuals (business owners). Net profit is calculated as business revenue minus expenses, information which is typically found in the financial statements of the business, along with shareholding details. Further analysis of profit and any related projections can be obtained from a forensic accountant report.

332.2. Profits from a sole proprietorship and a partnership are subject to individual tax as per the SARS rules. Companies and small business corporations are subject to different tax rates published by SARS. Company and small business corporation owners withdraw business net profits as dividends. In addition to the applicable business tax, dividends tax is therefore also applicable.

332.3. Net profits after tax deductions are used in the calculation of loss of earnings and loss of support calculations.

332.4. If no information is provided with regards to the type of the business, the actuarial ream assumes that the business is a sole proprietorship and that all the profits are distributed to the injured/deceased, before personal income tax is then applied.

333. Retirement benefits

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333.1. This includes a regular pension and/or lump sum benefits received by a person who has retired, resigned or has been retrenched. A benefit schedule from the retirement fund administrator shows the benefits received. Pensions are usually increased annually by retirement fund administrators based on the fund rules. If no information is provided about how the pensions increases, the RAF assumes that they increase in line with CPI.

333.2. Retirement benefits are classified as defined contribution or defined benefit.

333.3. A defined contribution pension plan is one where the employer and employee make contributions, and those contributions are invested over time to provide a payout at retirement. The final benefit amount of the pension is unknown because it is based on contributions and growth, and investment returns are unpredictable and subject to market volatility. For calculation purposes, the RAF assumes that the investment returns grow in line with earnings inflation.

333.4. Defined benefit plans provide specific and predictable benefit (or amount of income) at retirement. Essentially, a defined benefit plan offers guaranteed income for life. They are usually calculated based on the final pensionable salary, years of service and age at retirement.

333.5. Pensions are subject to personal income and retirement lump sums are subject to retirement lump sum tax (based on the nature of the retirement).

333.6. The RAF deals with pension benefits as follows:

333.7. Accounted for based on the applicable fund rules post-retirement; or

333.8. By allowing for non-taxable income equivalent to the employer's retirement fund contributions as part of monthly/weekly income.

334. Reported income

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334.1. In the absence of the source documents indicating the actual income received, earnings are taken as reported by the Assessors, Industrial Psychologists or other medical experts.

334.2. In some cases, the RAF may have data on past salary increases (e.g. government employees, industry papers, minimum wages etc). The team may also have information regarding likely salary growth in future (industry standards, or indication by the employer). Alternatively, the team may be instructed by the industrial psychologist/attorneys to assume a certain level of growth.

335. In loss of earnings calculations, the following earnings information is used:

335.1. Income at the time of the accident.

335.2. Income received during the period the Injured was off work following the accident.

335.3. Income received after the injured returned to work to date, where applicable.

335.4. Postulated earnings for the pre-accident and post-accident scenarios.

335.5. Retirement income or an estimate thereof.

336. In loss of support calculations, the following earnings information is used:

336.1. The deceased and the spouses' income at the time of death.

336.2. Retirement income or an estimate thereof.

337. Risk benefits

337.1. Risk benefits are a type of insurance where benefits are paid out if a person passes away, or is unable to work anymore, or someone in their family passes

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away. Risk benefits typically cover life assurance, disability benefits and funeral cover. The employer's contributions are not accounted for in loss of earnings and loss of support calculations.

337.2. A rule of thumb regarding risk benefits is that if the employer contributes towards the risk benefits, then we account for the risk benefits in our calculations. However, death benefits (and all benefits received as a result of death e.g., pension benefits to dependants) are not accounted for based on the Assessment of Damages Act. Some examples of risk benefits are group life, income protection benefits and funeral cover.

338. Self-employment or Business income

339. Income from self-employed persons or business owners may be received in one of the following forms:

339.1. Forensic accounting report – this expert report indicates the profit history from the period prior to the accident to date. Furthermore, the Forensic accountant postulates on the likely pre-morbid and post-morbid scenarios. In some instances, this report will indicate what the past loss is and what the postulated future pre-morbid and post-morbid career scenario should be.

339.2. Reported income by means of affidavits.

339.3. When no information is provided, the RAF uses self-employment earnings per the Quantum Yearbook, depending on the type of work they were doing, normally assuming the median earnings on the applicable scale.

340. Foreign earnings

340.1. There are cases where a person who works outside of the borders of South Africa is involved in an accident within the borders. In these cases, the RAF makes the following changes to the assumptions used:

340.2. Use tax rates that are applicable to the Injured's country or state;

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340.3. Use life tables that are applicable to the Injured's country or state;

340.4. Use past inflation that is applicable to the Injured's country or state;

340.5. Regarding future inflation, we only need to achieve a net discount rate of 2.5% per annum.

DEDUCTIONS AND NON-DEDUCTIBLES FOR LOS MATTERS

341. Disability grants and state old pensions

341.1. Disability Grants are financial benefits provided to individuals living with a disability who are South African citizens, permanent residents, or refugees residing in South Africa. To qualify for a Disability Grant, both the disabled person and their spouse (if applicable) must meet the criteria outlined in the Means Test.

341.2. Disability Grants are available for individuals between the ages of 18 and 59, while State Old Age Pensions are accessible for those aged 60 and above until death. Information relating to the Disability Grant received and State Old Age Pensions can be found from letters or printouts from the South African Social Security Agency (SASSA).

341.3. According to the ruling of Kapa v RAF (2018), the State Disability Grant should be deducted from the total loss of earnings. The RAF values the income of the Disability Grant separately, assuming that the injured will not satisfy the means test after the settlement of their claim. Therefore, no account is taken for the Disability Grant in future (from the calculation date until death).

341.4. These grants are not subject to any taxes. The actual values are accounted for in loss of earnings calculations without any deductions.

342. Unemployment Insurance Fund benefits

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342.1. Unemployment Insurance Fund (UIF) benefits are received by a person when their employer terminates them from service. This is a tax-free benefit. Actual UIF benefits are accounted for in loss of earnings calculations.

342.2. It is important to note that although the employer contributes to UIF, the employer's contributions cannot be taken as income.

343. Disability/Income protection benefits

343.1. If the injured has Disability/Income Protection policies, they may receive financial compensation if they are disabled, either in an accident or due to an illness, and are unable to work. The benefits stop if the person returns to work. The amount paid can either be a lump sum or a recurring income benefit.

343.2. These benefits are not taken into consideration in loss of earnings calculations if the person subscribed to them in their personal capacity. If a person had already been receiving these benefits before the accident and they die as a result of an accident, then we account for them in loss of support calculations.

343.3. It is important to note that Disability/Income protection benefits are tax-free.

344. Compensation For Occupational Injuries and Diseases Act (COIDA)

344.1. If a person gets injured, contracts a disease or dies while working, they or their dependants can claim from the Compensation Fund. The fund pays compensation to permanent and casual workers, trainees and apprentices who are injured or contract a disease in the course of their work and lose income as a result.

344.2. If an individual gets injured or dies while on duty as a result of a motor vehicle accident, the capitalised value of the COID pension is accounted for as a deduction from the loss of earnings or loss of support. The capitalised value is deducted after the application of merits apportionment and the CAP.

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345. Commuting Journey Policy (CJP) - Rand Mutual Assurance

346. CJP enhances employee protection by providing cover if an employee dies or becomes disabled as a result of an accidental injury which occurred while:

346.1. Journeying between home and work on a reasonable, direct route.

346.2. Travelling to and from company sanctioned events such as Sports, Memorial Services and Funerals.

347. If an individual gets injured or dies while commuting to or from work as a result of a motor vehicle accident, the capitalised value of the CJP pension is accounted for as a deduction from the loss of earnings or loss of support. The capitalised value is deducted after the application of merits apportionment and the RAF CAP.

MACROS USED IN THE MODELS

348. Below is a refined description of the macros within the models:

349. LoE Form/LoS Form:

349.1. A user-friendly form designed to facilitate the input of necessary information for the report. This includes:

349.2. Actuarial and Regional staff involved in the case.

349.3. Link and reference numbers for tracking purposes.

349.4. Details of the injured party and date of the accident.

349.5. Details of Plaintiff and Defendant Industrial Psychologist and joint minutes.

349.6. For LoS calculations, inclusion of details regarding dependents.

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350. Result generation macro:

351. This macro consolidates outcomes from various scenarios onto a single worksheet named "Results". To ensures that the pasted values are kept up to date with the latest inputs and calculations, the macro allows for refreshing of results.

352. Report creation macro:

352.1. This macro populates a report with essential details derived from the calculations, encompassing:

352.2. Actuarial and Regional staff involved in the case.

352.3. Link and reference numbers for tracking purposes.

352.4. Details of the injured party and date of the accident.

352.5. Details of Plaintiff and Defendant Industrial Psychologist and joint minutes.

352.6. For LoS calculations, inclusion of details regarding dependants

352.7. Contingency deductions

352.8. Details of the CAP (if applicable)

352.9. Computed results.

353. These functionalities are designed to enhance the efficiency and accuracy of data entry, result generation, and report creation within the model, particularly in the assessment of LoE and LoS scenarios.

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PROPOSED SOLUTION

Claimants' cohorts

354. Current practice considers three types of claims under RAF's loss of support product.

355. Claimants are either a surviving spouse/life partner, child dependent or a dependent parent (or other indigent person who can prove such indigence).

Spouse/life partner

356. The figure below shows various possible paths for spouse dependents (also representative for life partners) who were still married to (or in a life partnership with) the deceased at the time of accident.

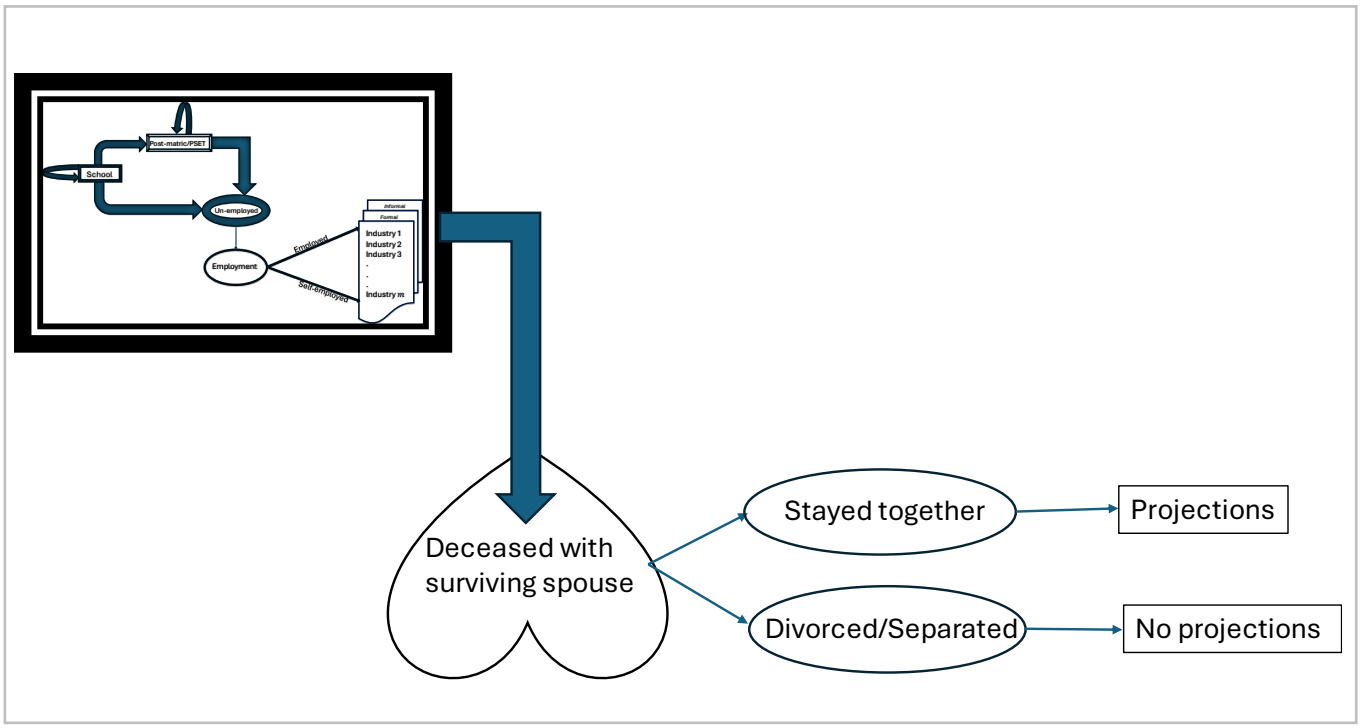

Figure 32: Spouse/Life Partner

357. The solution will adopt a definition of marriage/life partnership in terms used in current practice.

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358. The solution proposes an approach that takes the projected earnings and considers the possibilities of the deceased to still be married to their spouse(s) at the point of projection. The LoS is the present value of these projections.

$$E\left[\boldsymbol{LoS}_{age}\right] = \frac{C}{No.of\ Spouse} \times \sum_{work\_year}^{ERA} \sum_{j=1}^{n} e_j \times \ \boldsymbol{Pr}_j(pre - accident\ employment) \times \left[{}_{work\_year}\boldsymbol{Pr}_{age} \right] \times {}_{married}\boldsymbol{Pr}_{age}$$

Figure 33: Formula for Spouse/Life Partner

$E\left[\boldsymbol{LoS}_{age}\right]$=The expected loss of spousal support due to an individual dying in a South African road accident at the age of age.

C=Proportion of deceased's salary due to spousal support.

e_j=Pre-accident average earnings in industry j.

$No.of\ Spouse$=Number of spouses dependent on the deceased.

age=Age of deceased at which accident happened.

$married$= Years of marriage.

$work\_year$= Year of working, measured from date of accident.

ERA=Expected Retirement Age.

$\sum_{work\_year}^{ERA} x$=Sum of values of x for all years of working until ERA.

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$PV\ (x)$=Present value of values of x.

$\boldsymbol{Pr}_j(Pre\ accident)$=Pre-accident probability of employment in j industry given an individual is unemployed.

${}_{work\_year}\boldsymbol{Pr}_{age}$=Transitional probability of an individual aged age to survive $work\_year$.

${}_{married}\boldsymbol{Pr}_{age}$=An individual who is married at age to still be marries after $married$

359. The RAF proposes that the RAF allows for the probability of marriage in the calculation of Loss of Support.

360. The model needs projections of future earnings depending on highest level of education and work industry of the deceased at the time of accident.

361. Appropriate models will be sourced from LoE proposed solution.

Dependent children

362. The figure below shows various possible paths for a child dependent who were still dependent on the deceased at the time of accident.

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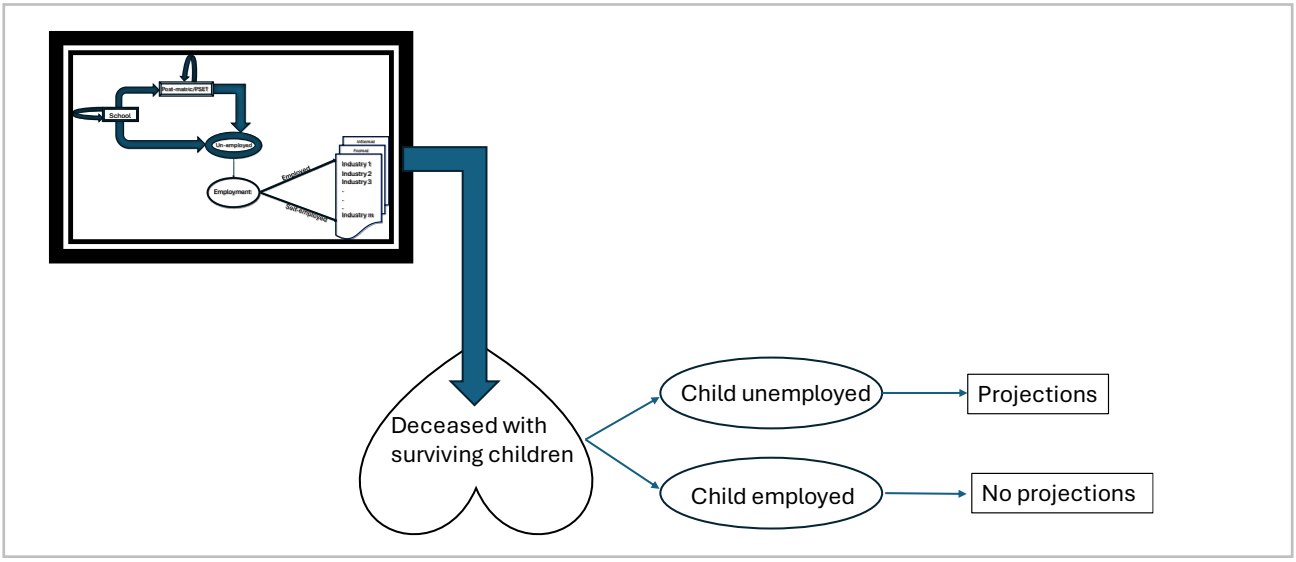

Figure 34: Dependent / Children

363. The solution proposes an approach that takes the projected earnings and considers the possibilities of the child to still be at school/unemployed at the point of projection. The LoS is the present value of these projections.

$$E[\boldsymbol{LoS}_{age}] = \frac{Ch}{No.of\ child_{dep}} \times \sum_{work\_year}^{ERA} \sum_{j=1}^{n} e_j \times \ \boldsymbol{Pr}_j(pre-accident\ employment) \times [\ {}_{21-age}\boldsymbol{Pr}_{child\_age}]$$

Figure 35: Formula for Dependent / Children

$E[\boldsymbol{LoS}_{age}]$=The expected loss of child support due to an individual dying in a South African road accident at the age of age.

Ch=Proportion of deceased's salary due to child support.

$No.of\ child_{dep}$=Number of dependent children.

e_j=Pre-accident average earnings in industry j.

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age=Age of deceased at which accident happened.

$work\_year$= Year of working, measured from date of accident.

ERA=Expected Retirement Age.

$\sum_{work\_year}^{ERA} x$=Sum of values of x for all years of working until ERA.

$PV\ (x)$=Present value of values of x.

$\boldsymbol{Pr}_j(Pre\ accident)$=Pre-accident probability of employment in j industry given an individual is unemployed.

${}_{work\_year}\boldsymbol{Pr}_{age}$=Transitional probability of an individual aged age to survive $work\_year$.

${}_{21-age}\boldsymbol{Pr}_{child\_age}$=Dependent child aged $child\_age$ to be alive from death of their parent until a given age of 21 (or whichever appropriate age is chosen).

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Dependent Parent

364. The figure below shows various possible paths for a parent who were still dependent on the deceased at the time of accident.

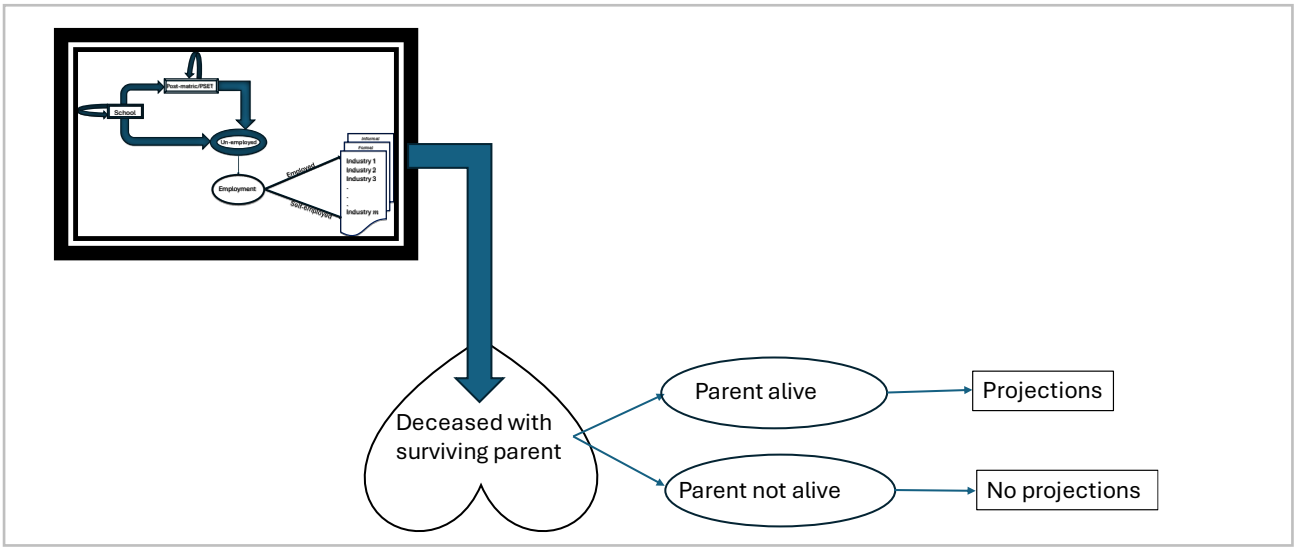

Figure 36: Dependent Parent

365. The RAF proposes an approach that takes the projected earnings and considers the possibilities of the parent to still be alive at the point of projection. The LoS is the present value of these projections.

$$E[\boldsymbol{LoS}_{age}] = \frac{Cp}{No.of\ Parent_{dep}} \times \sum_{work\_year}^{ERA} \sum_{j=1}^{n} e_j \times \boldsymbol{Pr}_j(pre-accident\ employment) \times [{}_{\text{work\_year}}\boldsymbol{Pr}_{\text{parent\_age}}]$$

Figure 37: Formula for Dependent Parent

where

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$E[\boldsymbol{LoS}_{age}]$=The expected loss of child support due to an individual dying in a South African road accident at the age of age.

Cp=Proportion of deceased's salary due to parent support.

$No.of\ Parent_{dep}$=Number of dependent children.

e_j=Pre-accident average earnings in industry j.

age=Age of deceased at which accident happened.

$work\_year$= Year of working, measured from date of accident.

ERA=Expected Retirement Age.

$\sum_{work\_year}^{ERA} x$=Sum of values of x for all years of working until ERA.

$PV\ (x)$=Present value of values of x.

$\boldsymbol{Pr}_j\ (Pre\ accident)$=Pre-accident probability of employment in j industry given an individual is unemployed.

$_{work\_year}\boldsymbol{Pr}_{age}$=Transitional probability of an individual aged age to survive $work\_year$.

$_{work\_year}\boldsymbol{Pr}_{Parent\_age}$=Dependent parent aged $Parent\_age$ to be alive from death of their parent until a given age of 21 (or whichever appropriate age is chosen).

Projected future earnings: pre-accident

366. The RAF proposes that the model considers inflationary (CPI) and promotional increases on deceased salary until their ERA.

367. The solution proposes that the deceased's earnings are projected in line with projected earnings for the employed cohorts under the LoE model described above.

Projected earnings: post-accident

368. The model sums past and future losses.

369. For past losses, prevailing information will be used to set value of earnings in the model.

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370. For future loses, earnings will be estimated using current earnings where they are available. Otherwise, current earnings will be estimated using average industry earnings taking impairment into account.

371. We propose a similar model to the above. However, the model needs to allow for the severity of impairment for each of the above probability.

372. Where there is no objective data of post-accident impairment effects on earnings, relevant experts will be sourced to provide an average effect for each impairment in each industry.

Data and research requirements

373. The RAF will make use of data and research on the following data points:

373.1. Graduation probabilities across the different NQF levels,

373.2. Employment probabilities by industry given qualifications,

373.3. Earnings potential for graduates in a) securing employment both pre- and post-accident,

373.4. Probabilities of spouse remarriage,

373.5. Probability of spouse re-entering the job market and securing work.

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PROPOSED STANDARD FORMULAE FOR LOSS OF SUPPORT

374. This formula is broadly summarised below:

Loss of Support = PV(Pre-Accident Household Earnings) - PV(Post-Accident Household Earnings) – Adjustments

Figure 38: Standard formula for LoS

Where:

PV(Pre-Accident Household Earnings): This is the present value of the household's earnings before the accident, considering the earnings the household would have received (net of income tax) had the accident not occurred. This includes both observed and expected earnings, adjusted for actual past inflation and projected future inflation, and discounted back to the calculation date while taking into account the mortality rates of the deceased.

PV(Post-Accident Household Earnings): This is the present value of the household's earnings after the accident, accounting for the actual earnings received (net of income tax) post-accident. Similar to the pre-accident earnings, this considers actual past inflation and projected future inflation, discounted to the calculation date, with survival probabilities of the household members factored in.

Adjustments: This includes considerations for contingencies, merits apportionment, and claim limits such as the statutory cap on claims. It also accounts for the distribution of after-tax income among the deceased, claimant, and dependents, with specific shares allocated as outlined in the detailed methodology.

375. Gender also is an important consideration in the calculation, as this has an impact on the life expectancy of adult dependents and the mortality rates used.

376. A key consideration that must be dealt with in outlining the proposed standard formula is the determination of a deceased’s pre-accident earnings.

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377. In the following section, details will be provided on how the earnings (being a key component of the quantification) are estimated in the proposed solution.

Determination of the earnings of the deceased's household

378. Given that deceased persons may range in age, work experience (if any), current income (if any) and future earnings prospects, the solution proposes the use of a classification system that groups deceased persons into 'cohorts', as outlined in sections 5.3.4 to 5.3.14 of this report, with each distinct cohort in essence being associated to a deceased's level of attained education, which is at the core of one's ability to achieve a certain level of future earnings.

379. With deceased persons grouped into the cohorts as outlined, the proposed solution further specifies a range of employment industries into which claimants from each of the 3 distinct cohorts would potentially have found work/continued to work while receiving earnings.

380. By calculating probabilities of transitioning through each of these cohorts and into particular industries of employment at the point that a deceased individual would have begun (or continued) to earn an income in a specified field of work, a standardised approach to determining the earnings progression into the future for the deceased in a cohort is achieved. Details of how this transitioning of the deceased in a cohort takes place is outlined in section 7.4 of this report.

381. This standardisation applies in the pre-accident setting, giving an estimate of the likely earnings path that would have been achieved were it not for the motor vehicle accident.

382. It is also important to note that the earnings of a household (combination of deceased's and spouse's earnings) are used to calculate the loss of support, particularly where a spouse was already working or had intentions to commence work prior to the accident. This is in line with the case between **Peri-Urban Areas Health Board v Munarin Supra, J A Holmes.**

383. In such an instance, where the earnings of the spouse are not available or where employment history is not existent, the same cohort-based approach will be used to

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determine the likelihood of the spouse entering a workforce and earning an income that will form part of the household's earnings.

384. Depending on which cohort the deceased (and where applicable, the spouse) would be placed at the time of the accident, the probabilities that are considered in this may include those of a deceased (and spouse) graduating (at primary, secondary and tertiary levels) as well as the probabilities of then obtaining employment in a given industry, given the attained level of education (primary, secondary, tertiary levels).

385. These probabilities will be calculated on an ongoing basis using data from local sources such as the Departments of Basic and Higher Education, Statistics South Africa, among others, in addition to international sources to fill in gaps where local data may be insufficient or missing. This approach will also incorporate a range of twenty-three potential employment industries and categories, as used by the Compensation Fund under COIDA.

386. Detail on how these probabilities are calculated through the transition phases outlined above is provided in section 5.3.18 of this report.

387. Having understood how the earning of a household are determined, it is also important to consider the additional inputs and assumptions that are made use of in obtaining the present values of the pre-accident earnings and the loss of support to the deceased's surviving dependents.

INPUTS AND ASSUMPTIONS TO BE USED IN DETERMINING LOSS OF SUPPORT

Demographic data

388. Data such as the deceased's gender, date of birth and ERA are crucial inputs for the calculation of LoS, as these directly impact:

388.1. the survival probability of the deceased in the future, had the accident not occurred, which will differ between males and females; and

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388.2. the duration following the accident over which the deceased would have been in a position to earn income that would be used to support the dependents of the deceased.

389. Demographic data is also to be provided for each of the dependents, including name, gender, date of birth and in the case of a surviving spouse/life partners and adult dependents, any indication of earnings at the time of the accident.

Case-specific date information

390. The date of the claim event for a LoS matter is the date of death. This is a factual date that marks the period following which a loss of support may have occurred to the surviving dependents of the deceased. It is important to note that this date is not always the same as the accident date.

391. The calculation date is the date at which the computation of the loss of support is effective. As this date falls after the date of the claim event, it gives rise to the concept of a past and future losses of earnings for the dependents, with the past loss being that which was incurred by each dependent between the date of death and the calculation date, and the future loss being that which applies over the period between the calculation date and the deceased's expected retirement date (in the case of adult dependents) or the date at which child dependents are expected to have attained majority.

Financial data inputs and assumptions

392. **Inflation** used in the calculation of LoS is the same as that used for the LoE calculation above.

393. **A discount rate** is the rate used to determine the present value of a series of future cashflows is the same as that used for the LoE calculations above.

394. **Tax** that is similar to how it is calculated for the LoE section above.

Mortality and impairment decrements

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395. Mortality assumptions will be set in a similar manner to the LoE section above.

Adjustments in light of contingencies, merits apportionment and the Cap

396. Contingencies refer to events that have a likelihood of occurring with uncertain outcomes and are difficult to quantify. These events have the potential to impact earnings, expenses, or the need for support in both the past and future.

397. In LoS, examples of contingencies include but are not limited to possibility of new sources of income (inheritance, insurance or pension), the remarriage of a spouse, changes to a spouse's earnings capacity, adoption of a child, marriage of a child, depreciation of the value of money and other factors.

398. While contingencies are acknowledged as being the prerogative of legal teams / the Court involved, in the proposed solution for LoS these are in line with the current practice of the RAF i.e.

Table 13: LoS contingencies for proposed solution

	Past loss	Future loss
Spouse	5%	15%
Children	5%	15%
Parents	5%	20%

399. The proposed LoS solution will still make allowance for adjustments to the claim amount calculated to take account of a victim's allocated percentage of responsibility for the motor vehicle accident. For example, a merits apportionment of 80% in favour of the deceased (or 20% against the deceased) means that the surviving dependents are only entitled to 80% of the claim.

400. In the case where the deceased has dependents who are not part of his household (dependents that the spouse does not support e.g. parents and illegitimate children), then only the deceased's income is accounted for in assessing these dependents' loss of support. The loss of support for the dependents who were not part of the household

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is taken as their share of the deceased's income only but accounting for the shares of all the deceased's dependents.

401. The loss of the dependants who are part of the household is calculated by adding the spouse's income with the deceased's remaining income (after deducting support of the dependants that are not part of the household).

402. When taking into account retirement benefits in LoS matters, the preferred method for use is one that assumes that the employee and employer's contributions are invested as one and only realised a retirement.

403. If the dependants of the deceased receive an inheritance as a result of the deceased's death, the dependants are said to have benefitted from the death as they may have received the inheritance at an earlier date than expected. The inheritance will need to be accounted for.

404. If the deceased and the surviving spouse were married in community of property, only 50% of the deceased's estate is accounted for. This is because the surviving spouse would have been entitled to the remaining 50% by virtue of being married in community of property.

405. However, If the deceased and the surviving spouse were married out of community of property, 100% of the deceased's estate is accounted for. If the nature of the marriage is not known, it is assumed by the RAF that the marriage was in community of property.

406. In the case of contemporaneous death of parents of a household, if one parent was unemployed, the share of this parent will be ignored in the allocation of the household income and subsequent loss of support.

407. If however, both parents were employed at the time of the accident, then the proposed solution allows for the calculation with the shares and incomes of both parents – first performing the calculation as if the first partner was deceased with the other surviving, and then swapping the process to assume death of the second spouse and survival of the first.

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408. The loss of support suffered by dependents in this instance will equal the aggregate losses of each approach.

409. Liquidation and Distribution Account (L&D) are structured to include assets, liabilities and a balance for distribution (total assets less total liabilities).

410. Assets encompass a range of possessions such as houses, cars, furniture, household contents, cash, insurance payouts, provident fund benefits, and similar holdings. Liabilities consist of various obligations including loans, Master's fees, Executor's remuneration, advertisement costs, debtors, maintenance expenses, and similar financial commitments.

411. For marriage in community of property, the RAF excludes the family home, furniture, household effects and the family car as well as the liabilities attached to these, on the assumption that the use of these did not increase as a result of the death. For marriage out of community of property the RAF accounts for all of the above.

412. In the proposed solution, proceeds of life insurance policies and pensions benefits in accordance with the Assessment of Damages Act 1969 are also excluded.

413. The balance of the estate (qualifying assets minus liabilities) is then accelerated and deducted from the loss of support.

414. For children, the proposed solution will assume that 100% of the inheritance is accelerated. Dependency is until 18 or 21 for children. Inheritance after that age does not constitute support to the children.

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CHAPTER 6: USER INTERFACE DESIGN AND USER GUIDELINES

415. The Road Accident Fund System is a comprehensive platform designed to streamline the process of claiming compensation for individuals affected by road accidents. This system aims to provide a user-friendly interface that allows users to efficiently manage their claims, update their profiles, and access detailed reports related to their claims.

KEY FEATURES

416. **Landing Page:** The entry point to the system, featuring the company logo and name, providing users with a familiar and branded interface.

417. **Login Page**: Users can securely access their accounts by entering their username and password. Forgot Password and Sign-Up options are available for password recovery and new user registration, respectively.

418. **Application Management** Page: After successful login, users are directed to the Application Management page, where they can view details of their applications, manage claims, update their profiles, and access report pages.

419. **Update Details Page**: Users can easily update their profile information, including username, password, email address, and other relevant details, ensuring accurate and up-to-date user data.

420. **Capture Claim Page**: Users can submit new claims through the Capture Claim page, providing essential details and information about their claims, such has loss of earnings, loss of support, and general damages.

421. **Report Page:** Users can access detailed reports and assessments related to their claims through the Report page, allowing them to review assessments of damages, injuries, and other relevant details. Reports can be downloaded for offline viewing or reference.

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422. **Conclusion:** The Road Accident Fund System is designed to simplify the claims process for individuals affected by road accidents, providing a user-friendly interface and comprehensive features for managing claims, updating profiles, and accessing detailed reports. With its intuitive design and functionality, the system aims to enhance efficiency and user experience for all stakeholders involved in the claims process.

USER EXPERIENCE (UX) DESIGN

Overview

423. The RAF is introducing a transformative initiative to streamline the claiming process and ensure equitable compensation for all claimants. The Solution aims to address the existing challenges, such as lengthy processing times, variations in compensation benefits, and inequity in compensation. This involves the development of a user-friendly online platform supported by robust actuarial models.

Key Objectives

424. **Minimise Backlogs and Ensure Equity:** Reduce the average processing time from 3-5 years to a more efficient timeline. Eliminate disparities in compensation benefits through the implementation of standardised actuarial formulas.

425. **Digital Transformation**: Shift from manual and paper-based procedures to a streamlined online platform. Enhance user experience by allowing claimants to input, submit, and track their claims digitally.

426. **Standardised Actuarial Formulas:** Develop and implement standardised actuarial formulas for Loss of Earnings (LoE), Loss of Support (LoS), and General Damages (GDs). Ensure transparency and objectivity in the calculation of settlement amounts.

Benefits for Claimants

427. **Faster Turnaround Times**: Claimants can expect significantly reduced processing times with the new online platform and standardised formulas.

428. **Equitable Compensation:** Standardised actuarial formulas will ensure fairness and eliminate the co-existence of over-compensated and under-compensated beneficiaries.

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429. **Transparency and Trust:** The shift towards standardised and objective criteria will enhance transparency, building trust among claimants.

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USER INTERFACE (UI) FLOW

Landing Page

Figure 39: Landing Page

430. Overview

430.1. The landing page serves as the entry point to the Road Accident Fund system.

430.2. Users access the landing page by entering the system's URL into their web browser.

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Key Elements

431. Brand Identity:

431.1. Prominently display the company logo and name for brand identity and credibility.

431.2. Reinforce that users have reached the correct website for the Road Accident Fund system.

432. User Actions:

432.1. Users can log in if they have an existing account.

432.2. New users can sign up for a new account.

433. User Guidance:

433.1. Provide clear instructions to guide users in navigating the platform efficiently.

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Login Screen

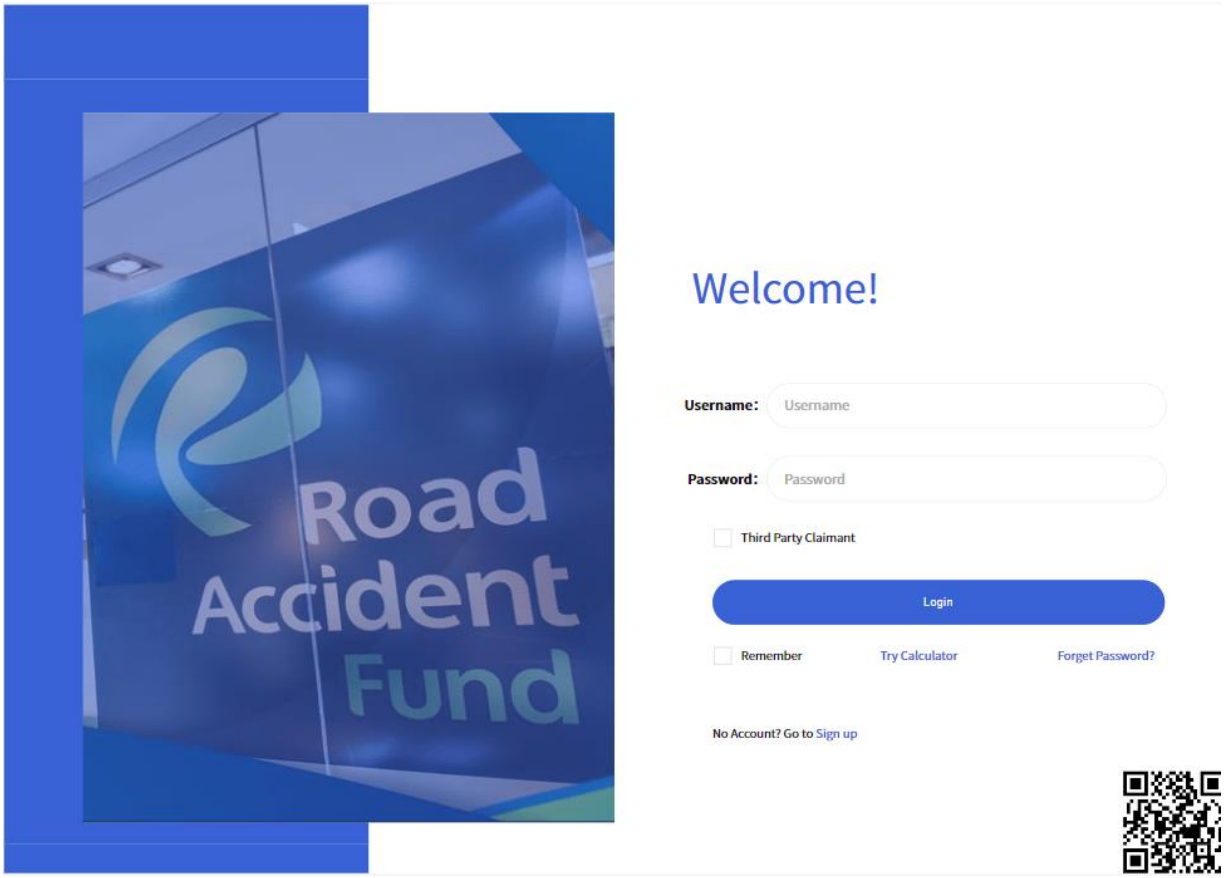

Figure 40: Login Screen

434. Overview

434.1. The gateway for users to access their accounts within the Road Accident Fund system.

Key Elements

435. Brand Identity:

435.1. Display the company logo and name for brand reinforcement.

436. Login Form:

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436.1. Username and password fields for authentication.

436.2. Third-Party Claimant checkbox for users claiming on behalf of another person.

436.3. Remember Password option for saving credentials.

436.4. Forgot Password link for password recovery.

437. QR Code:

437.1. Allow users to log in by scanning the QR code.

438. Password Validation:

438.1. Implement password validation rules (capital letter, special character, alphanumeric, length > 8).

439. Account Creation:

439.1. Option for users without an account to navigate to the sign-up page.

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Sign-up Form

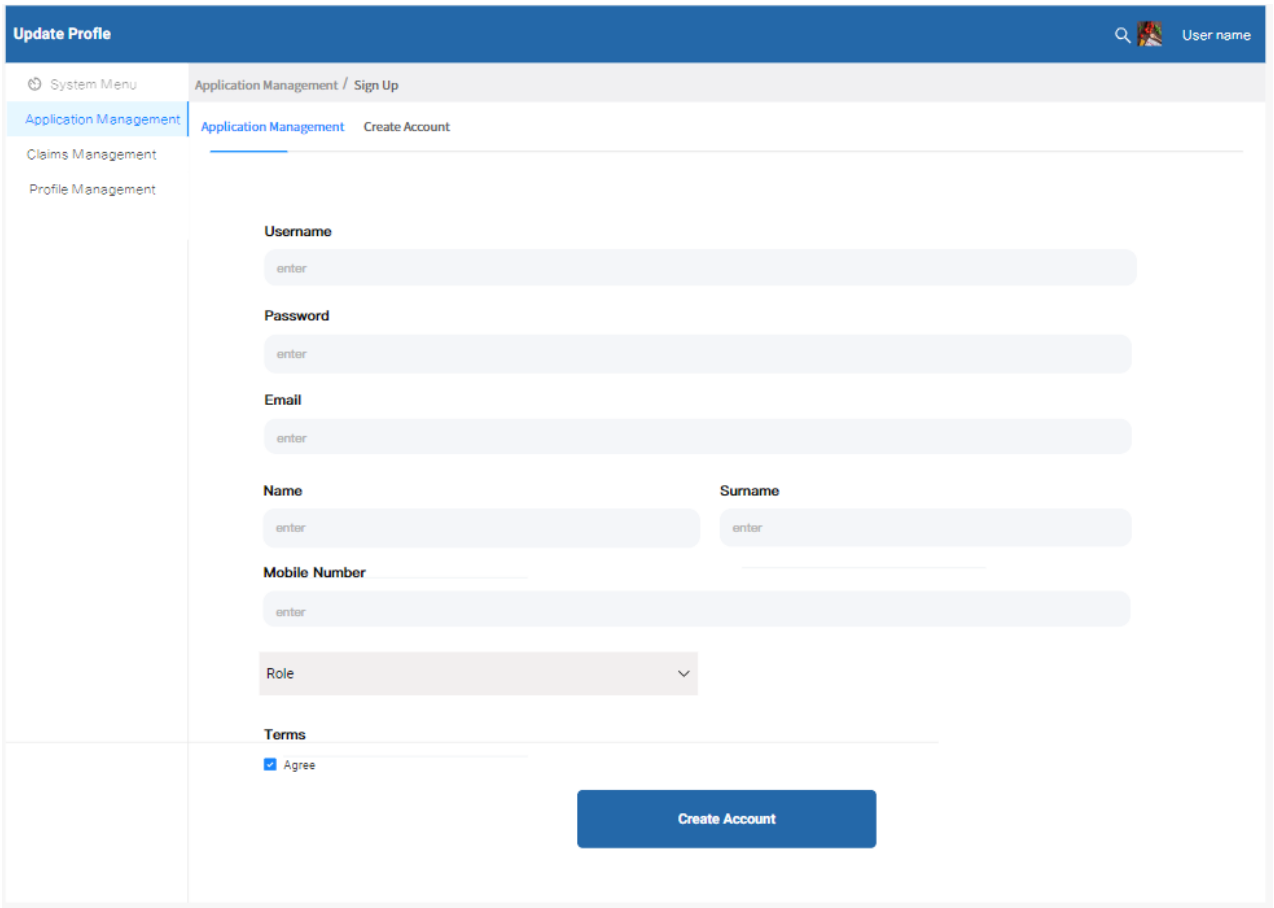

Figure 41: Sign up Form

440. Overview

440.1. Form for users to create a new account.

Key Elements

441. User Details:

441.1. Username, password, email address, name, surname, role, mobile number.

441.2. Checkbox for agreeing to Terms and Conditions.

442. Verification:

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442.1. Send an OTP to email or mobile number for validation.

443. Password Validation:

443.1. Implement password validation rules.

444. Role Selection:

444.1. Specify whether Claimant, Dependant, or 3rd Party Representative.

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Claims Homepage

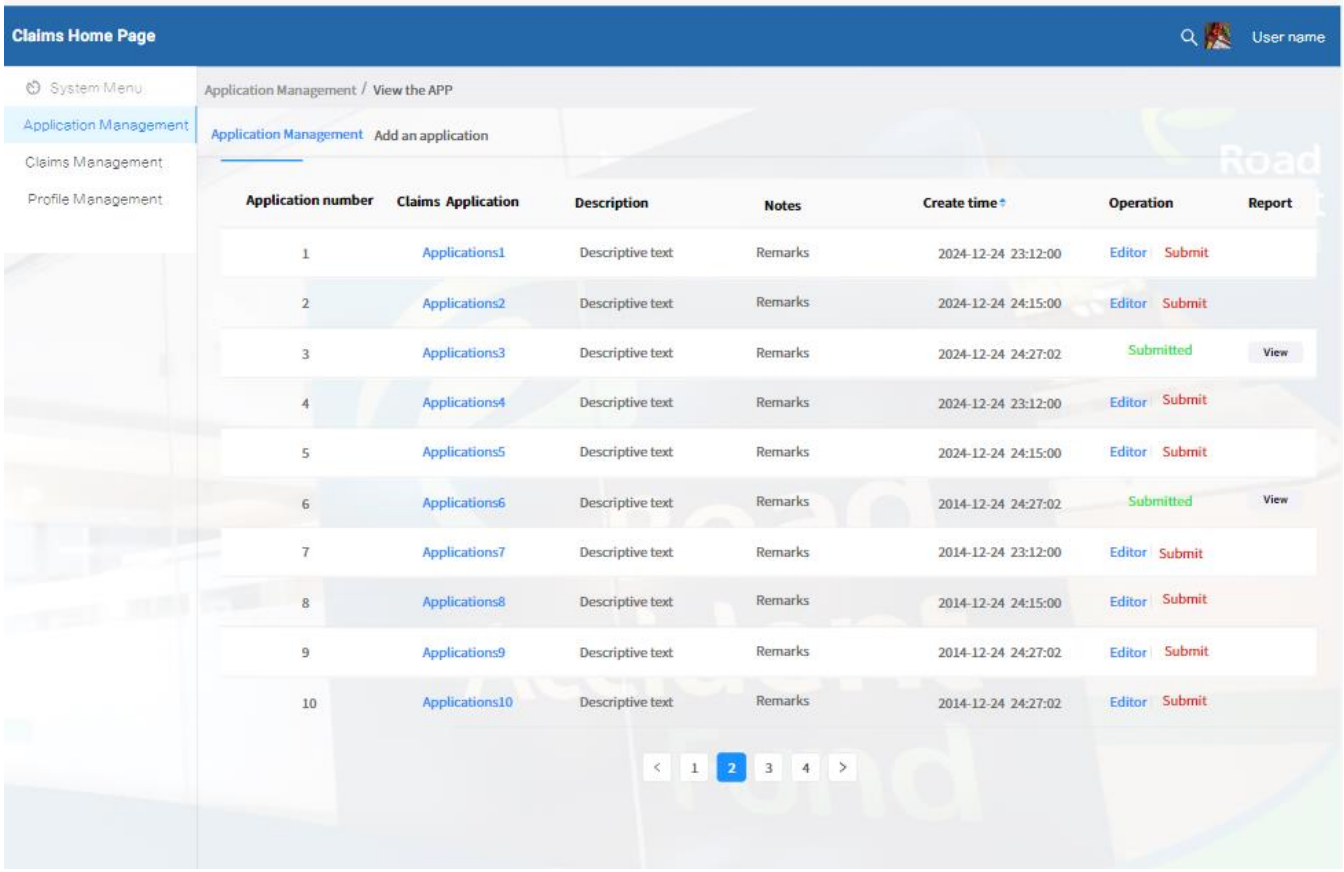

Figure 42: Claims Homepage

445. Overview

445.1. Central hub for managing claims within the Road Accident Fund system.

Key Elements

446. User Dashboard:

446.1. Display username and user profile for personalisation.

447. Navigation Menu:

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447.1. Options for Application Management, Claims Management, and Profile Management.

448. Add Application:

448.1. Users can add a new claims application.

449. Application Management Table:

449.1. Columns for application number, claims application, description, notes, creation time, operations, and reports.

450. Efficient Management:

450.1. Users can edit, submit, and view reports for each application.

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Update Profile Page

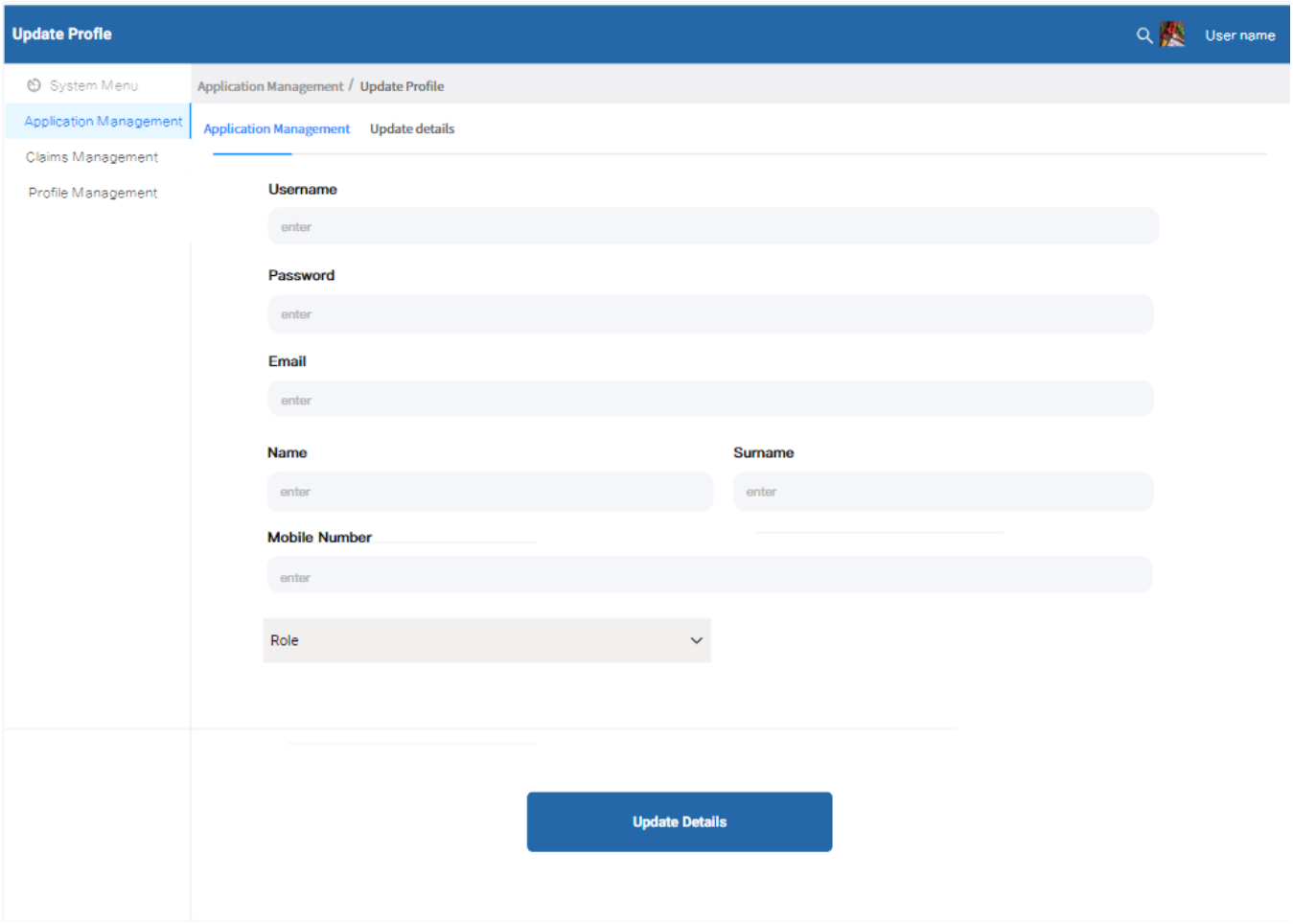

Figure 43: Update Profile Page

451. Overview

451.1. Allows users to modify personal details and settings within the Road Accident Fund system.

Key Elements

452. Editable Fields:

452.1. Allow users to update username, name, surname, password, email address, and role.

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453. Save Changes:

453.1. Changes made are saved and reflected in the user's profile.

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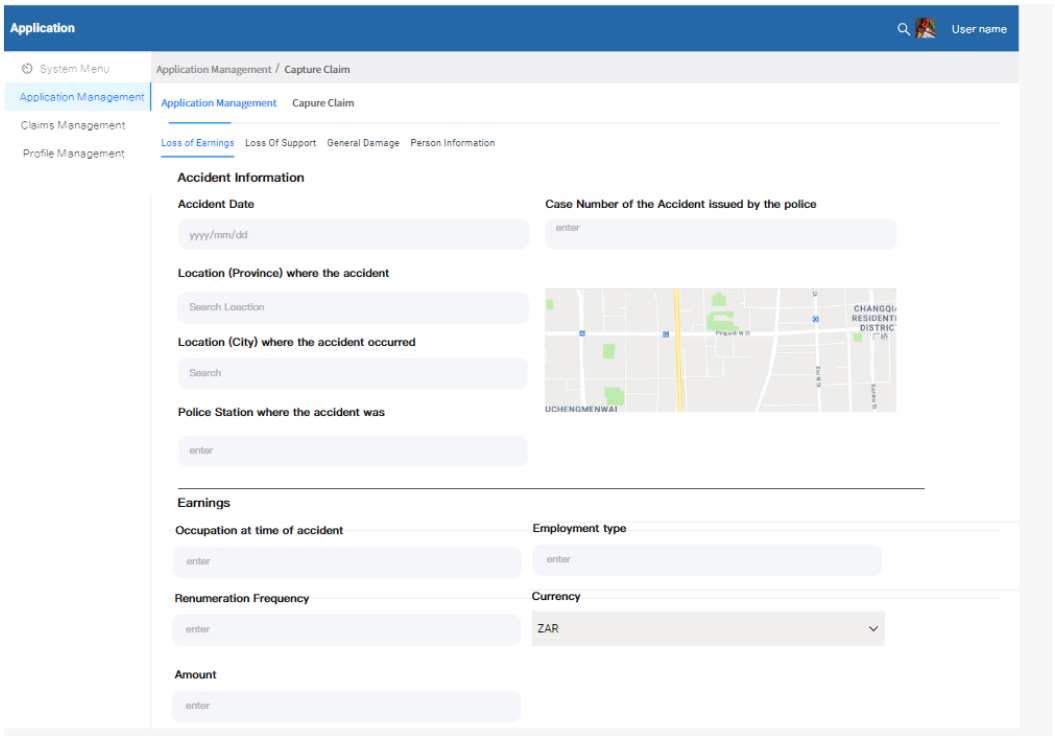
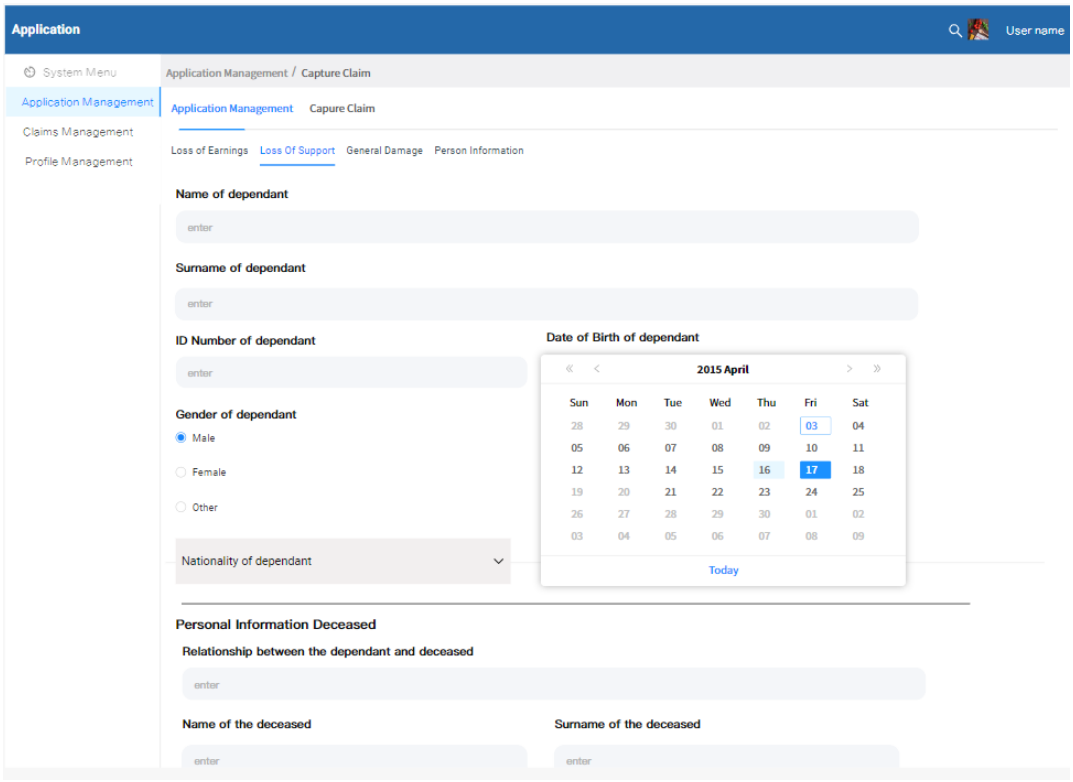
Capture Claim Screen





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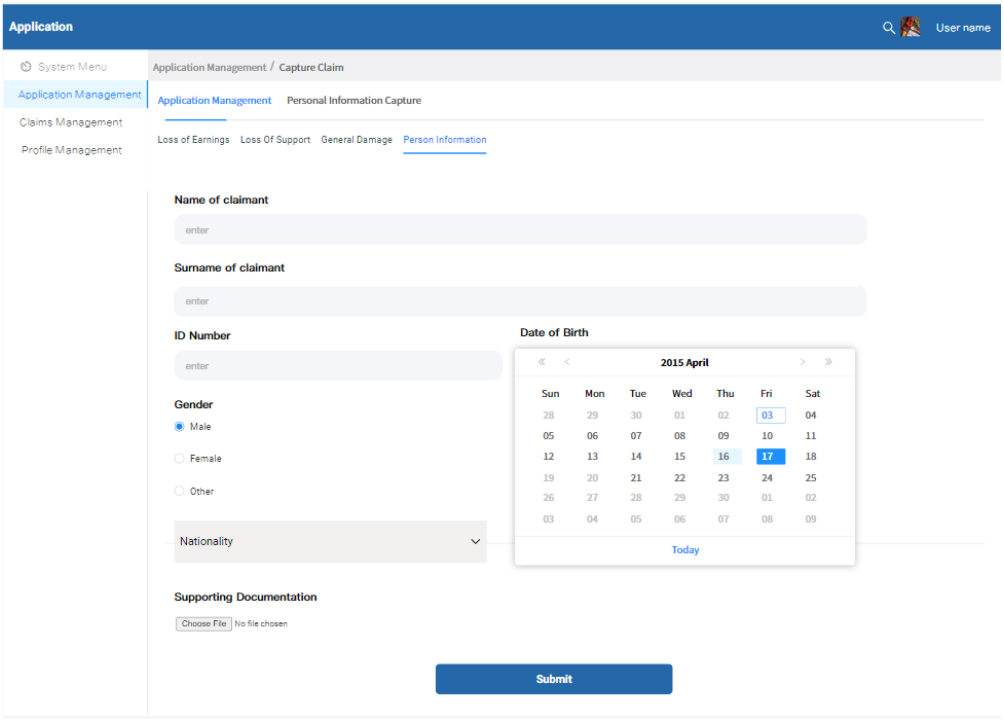

Figure 44: Capture Claim

454. Overview

454.1. Allows users to submit new claims within the Road Accident Fund system.

Key Elements

455. Claim Form Sections:

455.1. Loss of Earnings & General Damage, Loss of Support, Personal Information.

456. Accident Information:

456.1. Fields for accident date, case number, location (province, city), and police station.

457. Earnings Information:

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457.1. Fields for occupation at the time of the accident and current occupation.

458. Education History:

458.1. NQF Level selection.

459. Loss of Support Information:

459.1. Personal information for dependants and deceased individuals.

460. File Upload:

460.1. Support documents can be uploaded (optional).

461. Submission:

461.1. Users can submit the claim for processing.

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Report Page

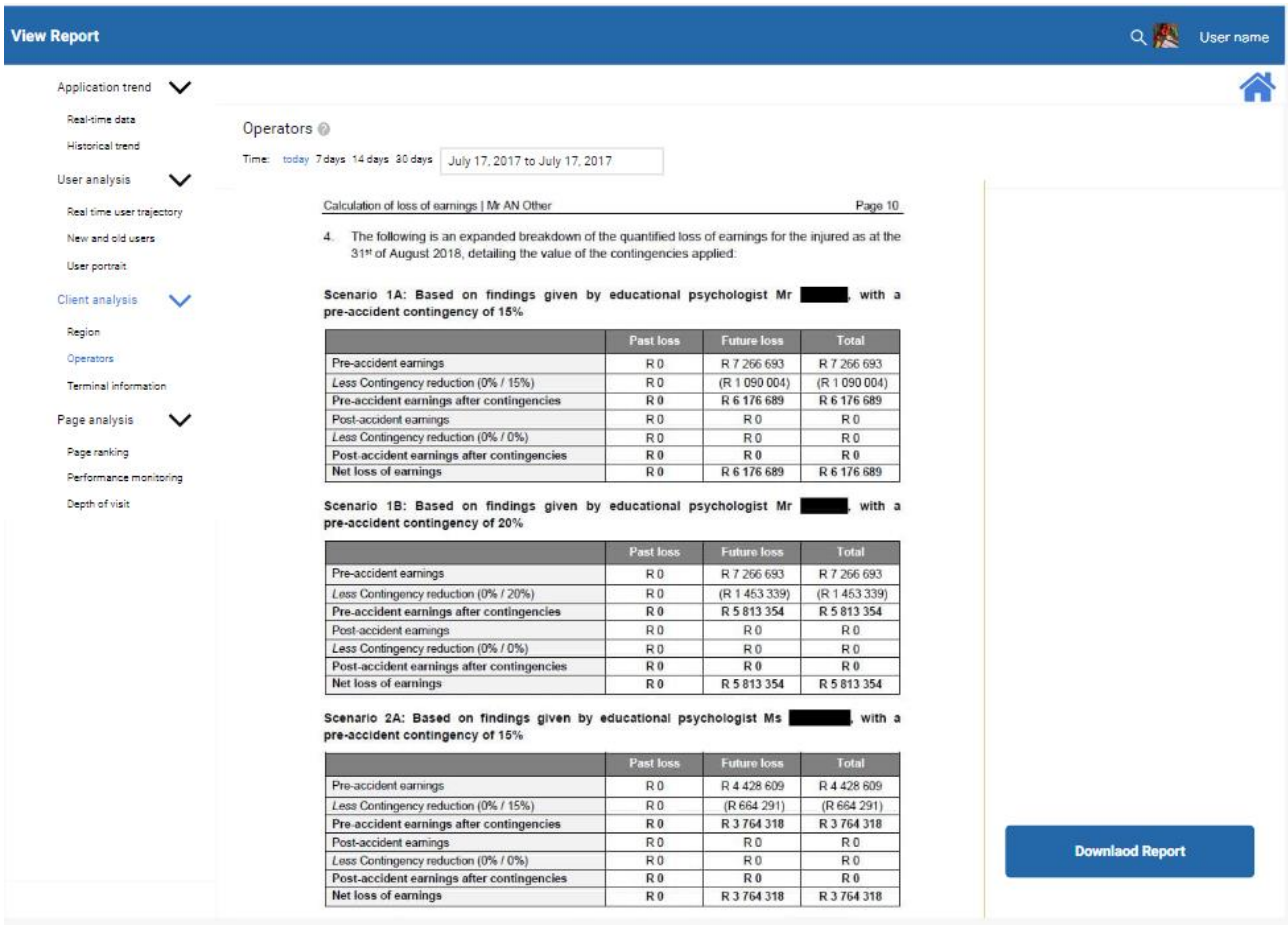

Figure 45: Report Page

462. Overview

462.1. Provides detailed reports and assessments related to users' claims.

Key Elements

463. Accessing Reports:

463.1. Users can click on "View Report" in the Application Management screen.

464. Detailed Information:

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464.1. Comprehensive information and assessments regarding the user's claim.

465. Download Option:

465.1. Users can download the report for offline viewing or referenc

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User Guide: Landing Page

Figure 46: User Guide Landing Page

466. Introduction

466.1. The landing page serves as the entry point to the Road Accident Fund system.

467. Navigation

467.1. Users can access the landing page by entering the system's URL into their web browser.

468. Content

468.1. The landing page prominently displays the company logo and name to establish brand identity and credibility.

`

469. Functionality

469.1. Upon landing on this page, users can immediately recognise that they have reached the correct website for the accessing the Road Accident Fund system.

470. Next Steps

470.1. From the landing page, users can proceed to log in if they already have an account or sign up for a new account if they are new users.

471. Conclusion

471.1. The landing page provides users with a clear starting point for accessing the Road Accident Fund system, helping them navigate the platform efficiently.

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User Guide: Login screen

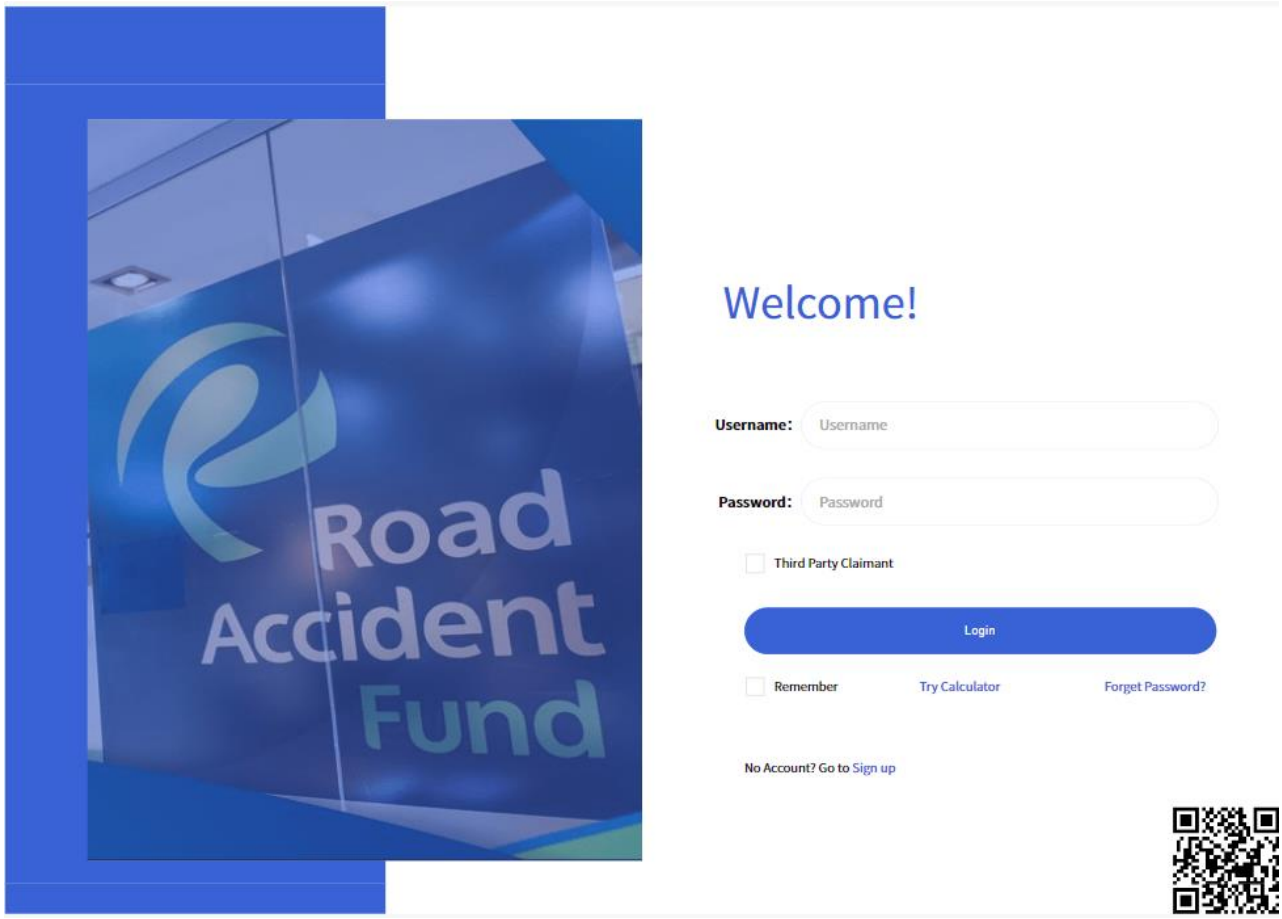

Figure 47: User Guide Login screen

472. Introduction

472.1. The login screen is the gateway for users to access their accounts within the Road Accident Fund system.

473. Navigation

473.1. To reach the login screen, users must first access the landing page and then click on the "Login" button.

474. Layout

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474.1. The login screen features the company logo and name on the left side, reinforcing brand identity.

474.2. On the right side, users encounter the login form.

474.3. At the bottom of the page, you will find a QR Code which you can scan to log in.

475. Login Form

The login form consists of three main fields:

475.1. **Username**: Users enter their unique username associated with their account. This field is a free text field, the user needs to type in their Username using the device keyboard.

475.2. **Password:** Users enter their password to authenticate their identity. This field is a free text field, the user needs to type in their Username using the device keyboard.

475.3. **Third-Party Claimant:** An optional checkbox for users who are claiming on behalf of another person (dependent or beneficiary). The user will need to click in the box to activate the tick in the box.

476. Additional Options

476.1. Remember Password: Users can opt to have their password saved for future logins.

476.2. Forgot Password: Users who have forgotten their password can click this link to initiate the password recovery process. An email will send the email addressed the user used to register, it will include a link that will take the user to the Update password page. (Password Validation include, first letter of the password should be capital, password must contain a special character

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(@, $, !, & etc), password should be alphanumeric and password length must be greater than 8 characters).

476.3. Try Calculator: User can use the calculator to calculate the claim using this type of information, medical expenses, loss of earnings, funeral expenses, and general damages for pain and suffering.

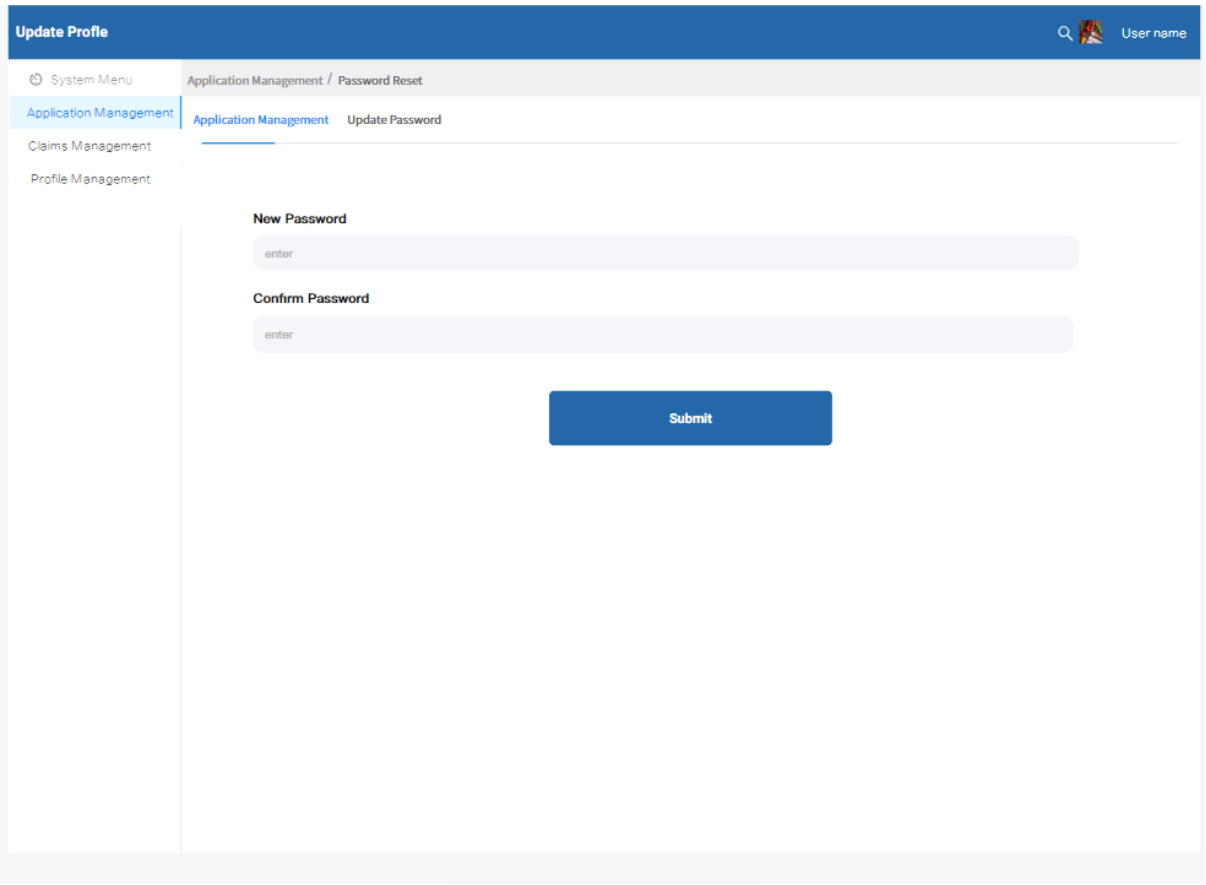

Figure 48: User Guide Change Password

476.4. No Account? Go to Sign Up: Users without an existing account can navigate to the sign-up page to create one.

477. Create account Form

477.1. User will be directed to the create account form if click on Sign up as they do not have an existing account.

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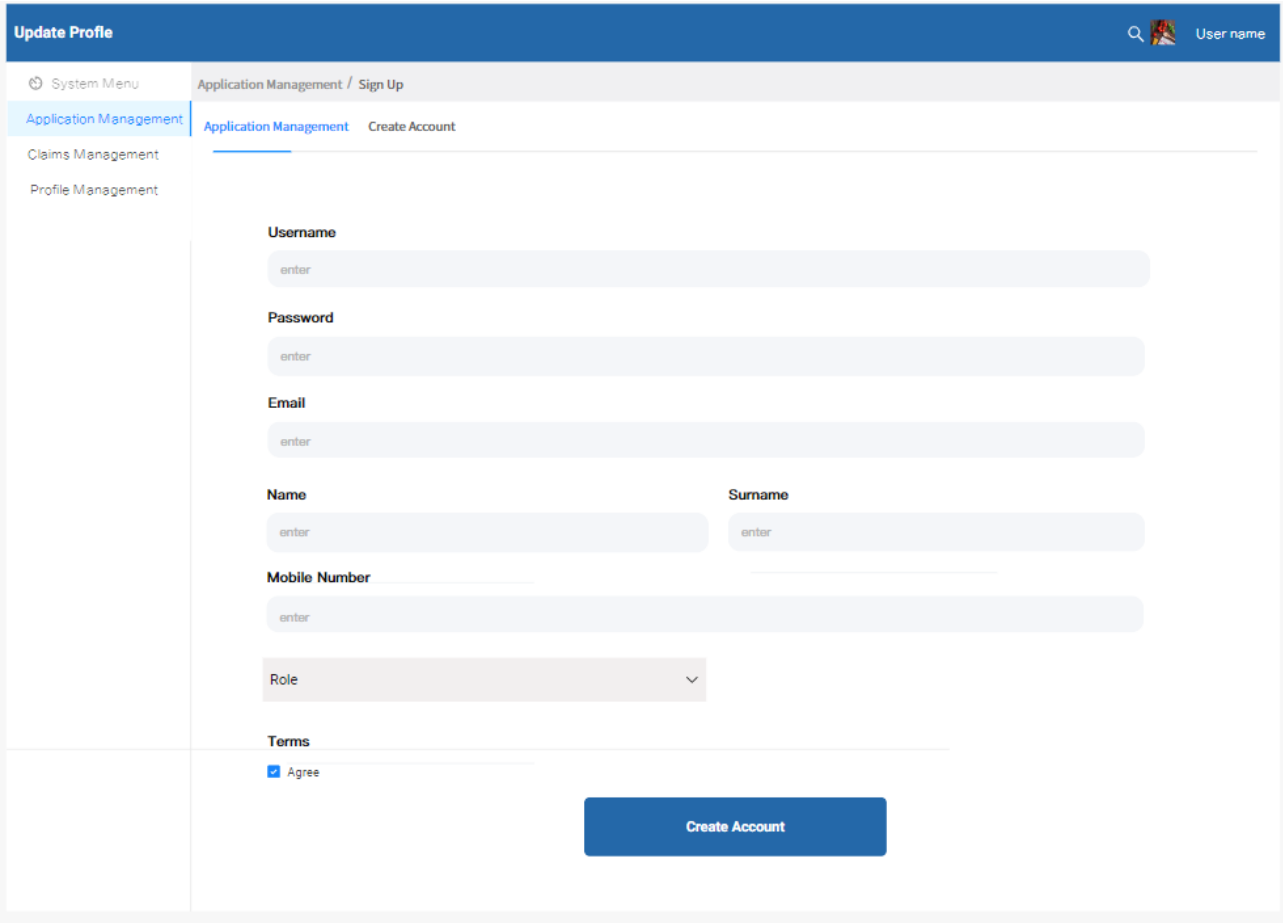

Figure 49: User Guide Sign Up

478. Sign-up form consists of the following fields:

478.1. Username: Create a unique username for your account. This field is a free text field, the user needs to type in their Username using the device keyboard.

478.2. Password: Set a password to secure and authenticate your identity. (Password Validation include, first letter of the password should be capital, password must contain a special character (@, $, !, &, etc) password should be alphanumeric and password length must be greater than 8 characters). This field is a free text field, the user needs to type in their Username using the device keyboard.

478.3. Email address: Provide your email address for account communication. Email needs to be in the correct email format. (Email example john.doe@example).

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This field is a free text field, the user needs to type in their Username using the device keyboard.

478.4. Name: Enter your first name. This field is a free text field, the user needs to type in their Username using the device keyboard.

478.5. Surname: Enter your last name. This field is a free text field, the user needs to type in their Username using the device keyboard.

478.6. Role: Specify Whether its Claimant, Dependant, 3rd Party Representative. This field is a picklist, the user will need to select from the three choices provided.

478.7. Mobile Number: Include your mobile number for account verification and contact purposes. (+27 followed by a 9-digit number). This field is a free text field, the user needs to type in their Username using the device keyboard.

478.8. Terms and Conditions checkbox. The user will need to click in the box to activate the tick in the box.

478.9. Upon submitting the form an OPT will be sent to your email or mobile number to validate if your email and Phone number is correct.

479. Functionality

479.1. Upon entering valid credentials and clicking the login button, users gain access to their accounts and proceed to the Claims Homepage.

480. Conclusion

480.1. The login screen provides a straightforward and secure method for users to access their accounts within the Road Accident Fund system, with options for password management and account creation readily available.

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User Guide: Claims Homepage

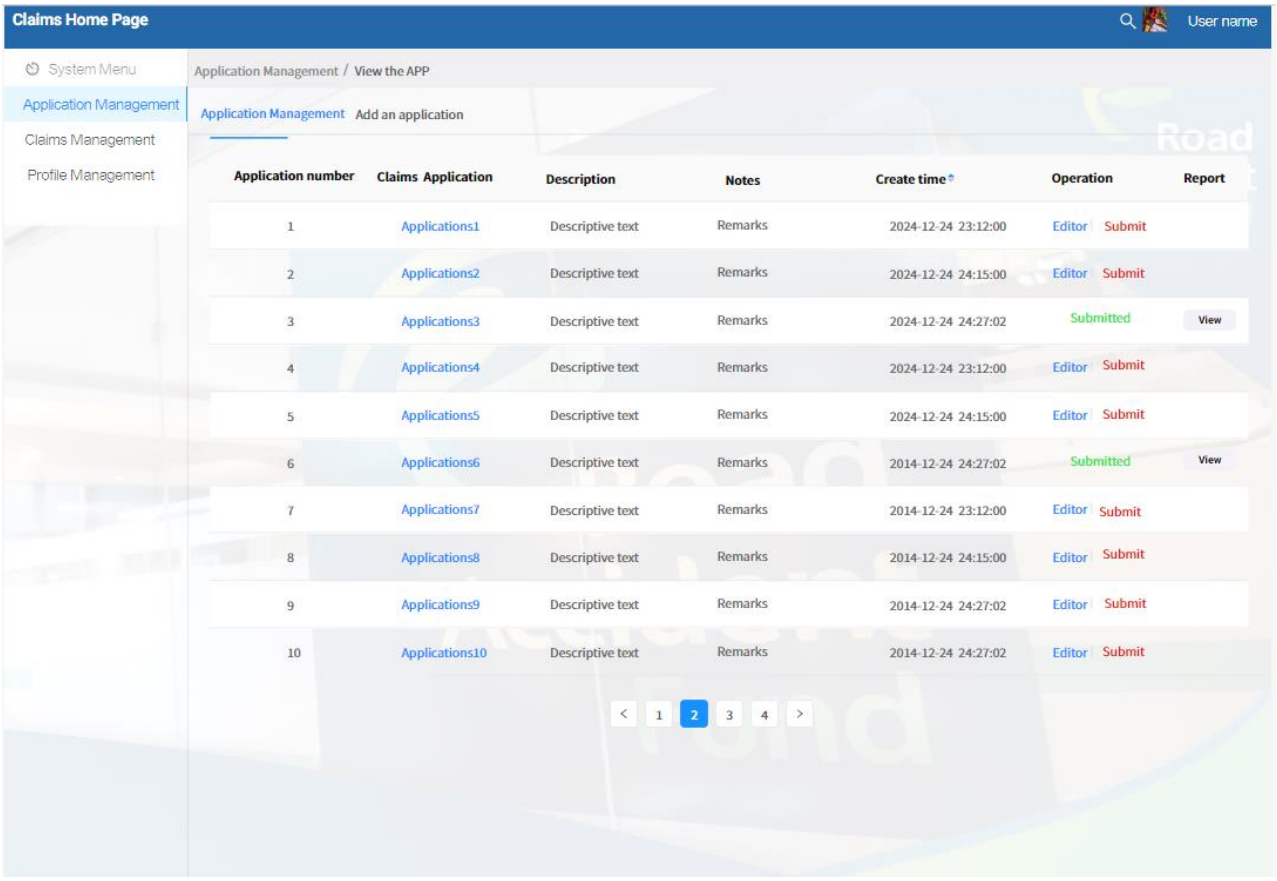

Figure 50: User Guide Claims Homepage

481. Introduction

481.1. The claims homepage is the central hub for managing claims within the Road Accident Fund system.

482. Navigation

482.1. Users access the claims homepage upon successfully logging into their accounts.

483. Layout

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483.1. The claims homepage features the username and user profile at the top, providing personalised information.

483.2. A search bar is available at the top for users to search for specific claims or information.

483.3. On the left side, users find a menu with three main options: Application Management, Claims Management, and Profile Management.

484. Application Management

484.1. Users can add a new claims application by selecting the "Add Application" option.

484.2. Under Application Management, users can also manage all their submitted applications.

484.3. A table displays various columns of information for each application, including application number, claims application, description, notes, creation time, operations and reports.

484.4. Application number includes the unique number of the claim application.

484.5. Claims application includes the label of the claim application.

484.6. Description includes a descriptive summary of the claim application.

484.7. Notes include any additional notes added to the claim application.

484.8. Creation time includes the time and date the claim application was created.

484.9. Operations include options to edit and submit a claim application.

484.10. Reports have an option to view reports related to each application.

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485. Functionality

485.1. Users can efficiently manage their claims applications, track progress, and perform necessary actions such as editing, submitting, or viewing reports.

486. Conclusion

486.1. The claims homepage provides users with comprehensive tools and functionalities to effectively manage their claims within the Road Accident Fund system, enhancing efficiency and user experience.

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User Guide: Update Profile Page

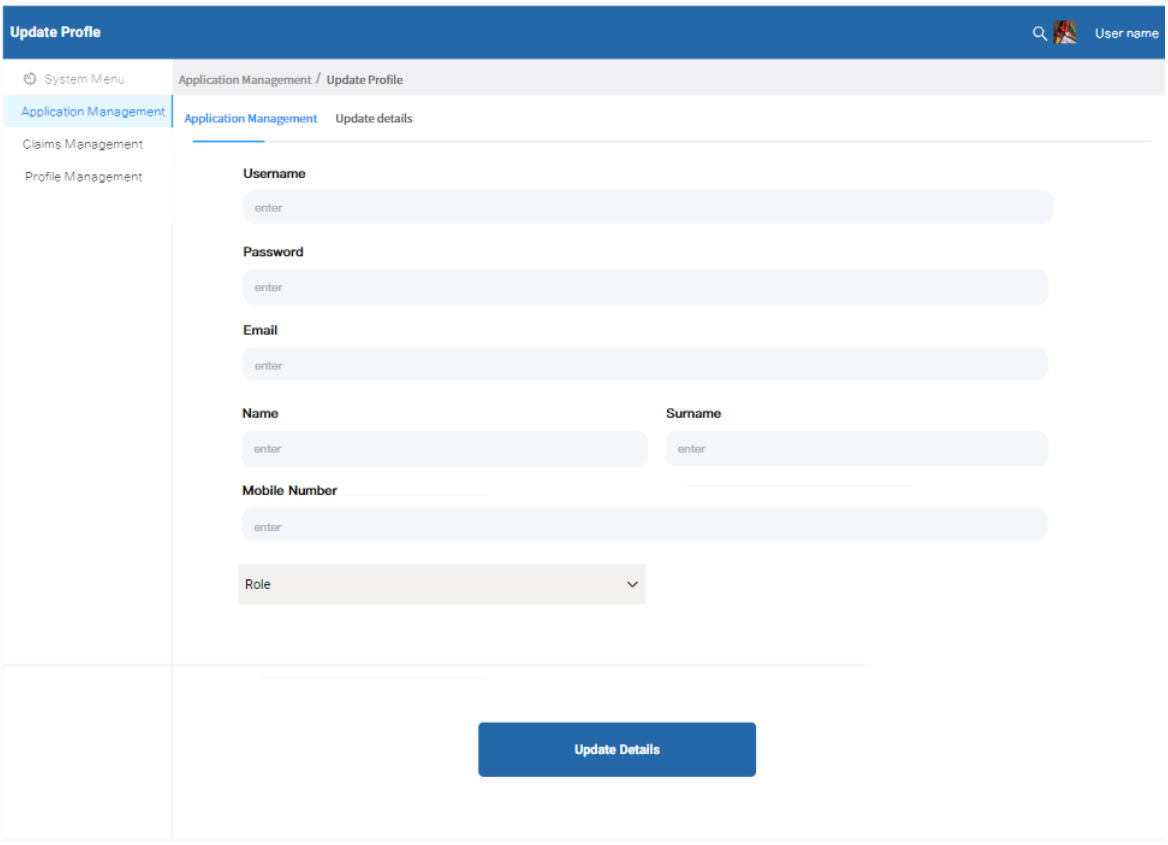

Figure 51: User Guide Update Profile

487. Introduction

487.1. The Update Profile page enables users to modify their personal details and settings within the Road Accident Fund system.

488. Navigation

488.1. Users access the Update Profile page by selecting the "Profile Management" option within the claim's homepage menu.

489. Functionality

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489.1. Upon accessing the Update Profile page, users can update various details, including:

489.2. Username (This field is a free text field; the user needs to type in their Username using the device keyboard.)

489.3. Name (This field is a free text field; the user needs to type in their Username using the device keyboard.)

489.4. Surname (This field is a free text field; the user needs to type in their Username using the device keyboard.)

489.5. Password (This field is a free text field; the user needs to type in their Username using the device keyboard.)

489.6. Email address (This field is a free text field; the user needs to type in their Username using the device keyboard.)

489.7. Role(This field is a picklist dropdown; the user need to click on it to display the available choices which are Claimant, Dependant, 3rd Party Representative. The user will proceed to click on one of the choices to continue updating their profile.)

490. Process

490.1. Users can navigate through different fields to update their information.

490.2. Changes made on this page are saved and reflected in the user's profile within the system.

491. Conclusion

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491.1. The Update Profile page offers users the flexibility to manage and maintain their personal information accurately within the Road Accident Fund system, ensuring data integrity and user control.

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User Guide: Capture Claim Screen

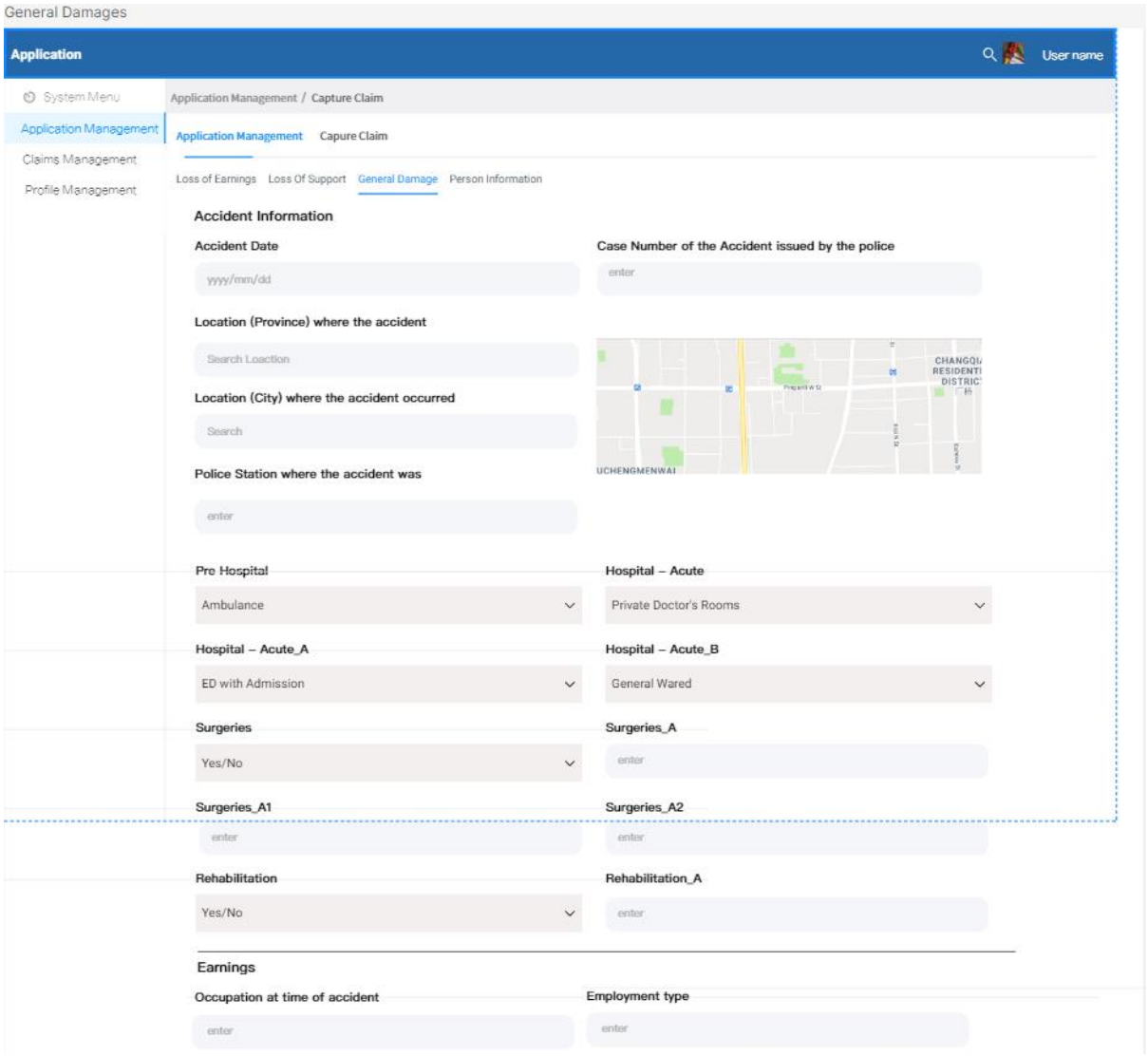

Figure 52: User Guide Capture Claim Screen

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492. Introduction

492.1. The Capture Claim screen allows users to submit new claims within the Road Accident Fund system

493. Layout

The screen is divided into three columns:

493.1. Loss of Earnings & General Damage: A claim for loss of earnings is premised on the basis that there is an obligation on the RAF to place the injured in the same position that he or she would have been had the accident not occurred.

493.2. Loss of Support: For beneficiaries or dependents to claim support on behalf of the deceased or incapacitated.

493.3. Personal Information: For claimants' personal information.

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Loss of earnings and General damages claim form input.

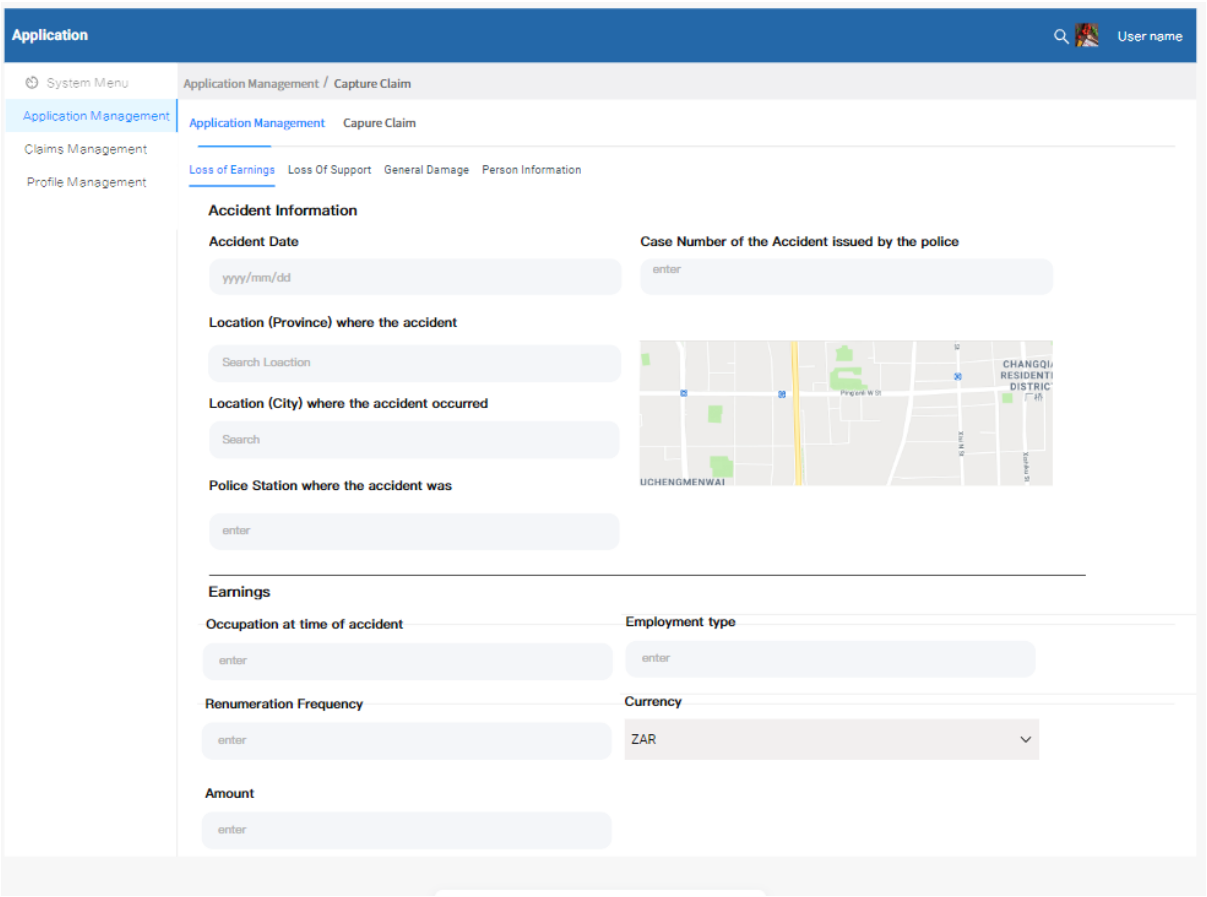

Figure 53: User Guide LoE

494. Accident Information

494.1. Accident date (This is date field. The user will need to enter the date by typing on their device keyboard. The date format is yyyy-mm-dd)

494.2. Case Number of the Accident issued by the police. (This field is a free text field; the user needs to type in Case Number using the device keyboard.)

494.3. Location (Province) where the accident occurred. (This is a picklist field. It is a dropdown with all 9 Provinces. The user will need to select the province of which the accident occurred.)

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494.4. Location (City) where the accident occurred. (This is a picklist field. It is a dropdown with all cities within the province selected. The user will need to select the city of which the accident occurred.)

494.5. Police Station where the accident was reported and captured. (This is a picklist field. It is a dropdown with all police stations within the city selected. The user will need to select the police station of which the accident reported and captured.

495. Earnings

495.1. Occupation at time of accident

495.2. Employment type (Payslip will have to be uploaded. This is a picklist field. It is a dropdown with different types of employment. The type of employment is formal employment, informal employment and self-employed and unemployed)

495.3. Industry (This field is a free text field; the user needs to type in the industry of employment using the device keyboard. NB: This field will be greyed out if the user selected unemployed on the “Employment type” field.)

495.4. Sector (This field is a free text field; the user needs to type in the sector of employment using the device keyboard. NB: This field will be greyed out if the user selected unemployed on the “Employment type” field.)

495.5. Occupation (This field is a free text field; the user needs to type in the occupation of employment using the device keyboard. NB: This field will be greyed out if the user selected unemployed on the “Employment type” field.)

495.6. Renumeration Frequency (This is a picklist field. It is a dropdown with different types of renumeration. The list includes Hourly, Daily, Weekly, Monthly and Annually. The user will need to select from the list. NB: This field will be greyed out if the user selected unemployed on the “Employment type” field.)

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495.7. Currency (This is a picklist field. It is a dropdown with different types of currencies for all the countries. The user will need to select from the list. NB: This field will be greyed out if the user selected unemployed on the “Employment type” field.)

495.8. Amount (This field is a free text field; the user needs to type in the amount of salary using the device keyboard. NB: This field will be greyed out if the user selected unemployed on the “Employment type” field.)

496. Current Occupation

496.1. Employment type (Payslip will have to be uploaded. This is a picklist field. It is a dropdown with different types of employment. The type of employment is formal employment, informal employment and self-employed and unemployed)

496.2. Industry (This field is a free text field; the user needs to type in the industry of employment using the device keyboard. NB: This field will be greyed out if the user selected unemployed on the “Employment type” field.)

496.3. Sector (This field is a free text field; the user needs to type in the sector of employment using the device keyboard. NB: This field will be greyed out if the user selected unemployed on the “Employment type” field.)

496.4. Occupation (This field is a free text field; the user needs to type in the occupation of employment using the device keyboard. NB: This field will be greyed out if the user selected unemployed on the “Employment type” field.)

496.5. Renumeration Frequency (This is a picklist field. It is a dropdown with different types of renumeration. The list includes Hourly, Daily, Weekly, Monthly and Annually. The user will need to select from the list. NB: This field will be greyed out if the user selected unemployed on the “Employment type” field.)

496.6. Currency (This is a picklist field. It is a dropdown with different types of currencies for all the countries. The user will need to select from the list. NB:

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This field will be greyed out if the user selected unemployed on the “Employment type” field.)

496.7. Amount (This field is a free text field; the user needs to type in the amount of salary using the device keyboard. NB: This field will be greyed out if the user selected unemployed on the “Employment type” field.)

497. Education History

497.1. NQF Level (This is a picklist field. It is a dropdown with different NQF levels. The user will need to select from the list, the list includes matric, diploma, degree, masters.)

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Loss of support claim form input

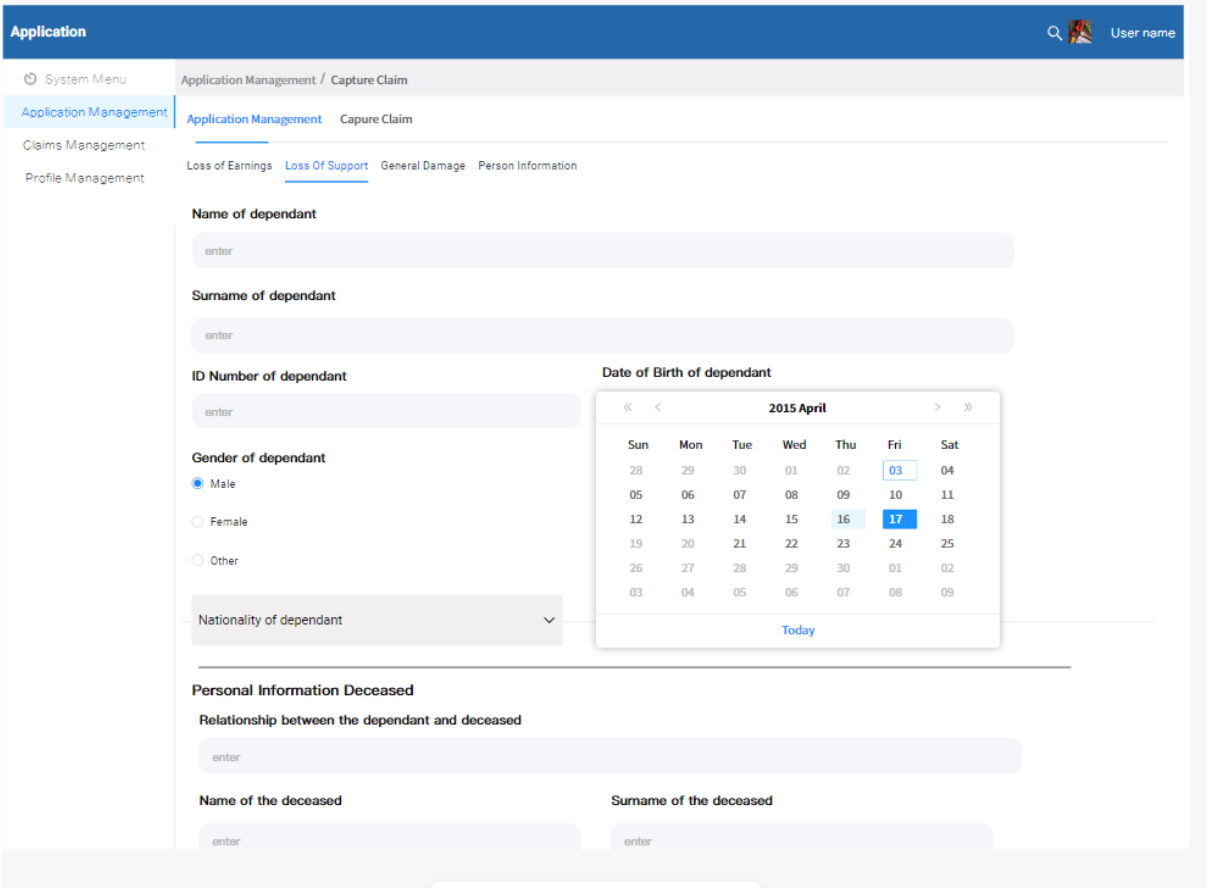

Figure 54: User Guide LoS

498. Personal Information Dependant.

498.1. Name of the dependant. (This field is a free text field; the user needs to type in their name using the device keyboard.)

498.2. Surname of the dependant (This field is a free text field; the user needs to type in their surname using the device keyboard.)

498.3. ID Number of the dependant. (This field is a free text field; the user needs to type in their ID number using the device keyboard.)

498.4. Date of birth of the dependant. (This field is a picklist field; the user needs to select the date on the calendar provided. The format of the date is yyyy-mm-dd)

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498.5. Gender of the dependant. (This field is a picklist field; the user needs to select their gender on the list provided. The list is male and female.)

498.6. Nationality of dependant. (This field is a picklist field; the user needs to select their nationality on the list of countries provided.)

499. Personal Information Deceased.

499.1. Name of the deceased. (This field is a free text field; the user needs to type in the name of the deceased using the device keyboard.)

499.2. Surname of the deceased (This field is a free text field; the user needs to type in the surname of the deceased using the device keyboard.)

499.3. ID Number of the deceased. (This field is a free text field; the user needs to type in the ID number of the deceased using the device keyboard.)

499.4. Date of birth of the deceased. (This field is a picklist field; the user needs to select the date of birth of the deceased on the calendar provided. The format of the date is yyyy-mm-dd)

499.5. Gender of the deceased. (This field is a picklist field; the user needs to select the gender of the deceased on the list provided. The list is male and female.)

499.6. Nationality of deceased. (This field is a picklist field; the user needs to select the nationality of the deceased on the list of countries provided).

500. Accident Information

500.1. Accident date (This is date field. The user will need to enter the date by typing on their device keyboard. The date format is yyyy-mm-dd)

500.2. Case Number of the Accident issued by the police. (This field is a free text field; the user needs to type in Case Number using the device keyboard.)

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500.3. Location (Province) where the accident occurred. (This is a picklist field. It is a dropdown with all 9 Provinces. The user will need to select the province of which the accident occurred.)

500.4. Location (City) where the accident occurred. (This is a picklist field. It is a dropdown with all cities within the province selected. The user will need to select the city of which the accident occurred.)

500.5. Police Station where the accident was reported and captured. (This is a picklist field. It is a dropdown with all police stations within the city selected. The user will need to select the police station of which the accident reported and captured).

501. Earnings

501.1. Occupation at time of accident

501.2. Employment type (Payslip will have to be uploaded. This is a picklist field. It is a dropdown with different types of employment. The type of employment is formal employment, informal employment and self-employed and unemployed)

501.3. Industry (This field is a free text field; the user needs to type in the industry of employment using the device keyboard. NB: This field will be greyed out if the user selected unemployed on the “Employment type” field.)

501.4. Sector (This field is a free text field; the user needs to type in the sector of employment using the device keyboard. NB: This field will be greyed out if the user selected unemployed on the “Employment type” field.)

501.5. Occupation (This field is a free text field; the user needs to type in the occupation of employment using the device keyboard. NB: This field will be greyed out if the user selected unemployed on the “Employment type” field.)

501.6. Renumeration Frequency (This is a picklist field. It is a dropdown with different types of renumeration. The list includes Hourly, Daily, Weekly, Monthly and

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Annually. The user will need to select from the list. NB: This field will be greyed out if the user selected unemployed on the “Employment type” field.)

501.7. Currency (This is a picklist field. It is a dropdown with different types of currencies for all the countries. The user will need to select from the list. NB: This field will be greyed out if the user selected unemployed on the “Employment type” field.)

501.8. Amount (This field is a free text field; the user needs to type in the amount of salary using the device keyboard. NB: This field will be greyed out if the user selected unemployed on the “Employment type” field.)

502. Current Occupation

502.1. Employment type (Payslip will have to be uploaded. This is a picklist field. It is a dropdown with different types of employment. The type of employment is formal employment, informal employment and self-employed and unemployed)

502.2. Industry (This field is a free text field; the user needs to type in the industry of employment using the device keyboard. NB: This field will be greyed out if the user selected unemployed on the “Employment type” field.)

502.3. Sector (This field is a free text field; the user needs to type in the sector of employment using the device keyboard. NB: This field will be greyed out if the user selected unemployed on the “Employment type” field.)

502.4. Occupation (This field is a free text field; the user needs to type in the occupation of employment using the device keyboard. NB: This field will be greyed out if the user selected unemployed on the “Employment type” field.)

502.5. Renumeration Frequency (This is a picklist field. It is a dropdown with different types of renumeration. The list includes Hourly, Daily, Weekly, Monthly and Annually. The user will need to select from the list. NB: This field will be greyed out if the user selected unemployed on the “Employment type” field.)

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502.6. Currency (This is a picklist field. It is a dropdown with different types of currencies for all the countries. The user will need to select from the list. NB: This field will be greyed out if the user selected unemployed on the “Employment type” field.)

502.7. Amount (This field is a free text field; the user needs to type in the amount of salary using the device keyboard. NB: This field will be greyed out if the user selected unemployed on the “Employment type” field.)

503. Education History

503.1. NQF Level (This is a picklist field. It is a dropdown with different NQF levels. The user will need to select from the list, the list includes matric, diploma, degree, masters.)

504. Treating Doctor’s Information

504.1. Name (This field is a free text field; the user needs to type in the industry of employment using the device keyboard.)

504.2. Surname (This field is a free text field; the user needs to type in the industry of employment using the device keyboard.)

504.3. ID Number (This field is a free text field; the user needs to type in the industry of employment using the device keyboard.)

504.4. Email Address (This field is a free text field; the user needs to type in the industry of employment using the device keyboard.)

504.5. Mobile Number (This field is a free text field; the user needs to type in the industry of employment using the device keyboard.)

505. Treating/Assessing Doctors Information

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505.1. Diagnosis (This is a picklist field. It is a dropdown with different Diagnosis levels. The user will need to select from the list)

505.2. MMI period (This is a picklist field. It is a dropdown with different periods. The user will need to select from the list, the list includes 0-6, 6-12, >12 months.)

505.3. Final Diagnosis (This is a picklist field. It is a dropdown with different Diagnosis levels. The user will need to select from the list)

505.4. Polytrauma (This is a picklist field. It is a dropdown with different Polytrauma's. The user will need to select from the list)

505.5. Injuries (This is a multi-select picklist field. It is a dropdown with different injuries. The user will need to select from the list)

506. Assessing Adjudicator Information

506.1. Name (This field is a free text field; the user needs to type in the industry of employment using the device keyboard.)

506.2. Surname (This field is a free text field; the user needs to type in the industry of employment using the device keyboard.)

506.3. ID Number (This field is a free text field; the user needs to type in the industry of employment using the device keyboard.)

507. Completed by Treating Clinician

507.1. MMI period (This is a picklist field. It is a dropdown with different Periods. The user will need to select from the list, the list includes [0-6], [6-12], [>12 months].)

507.2. MMI explainer: Is there any expected further improvement? (This is a picklist field. It is a dropdown with different Periods. The user will need to select from the list, the list includes Yes or No.)

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507.3. Final Diagnosis (This is a picklist field. It is a dropdown with different Periods. The user will need to select from the list)

507.4. Injuries (This is a multi-select picklist field. It is a dropdown with different injuries. The user will need to select from the list)

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Personal Information form input

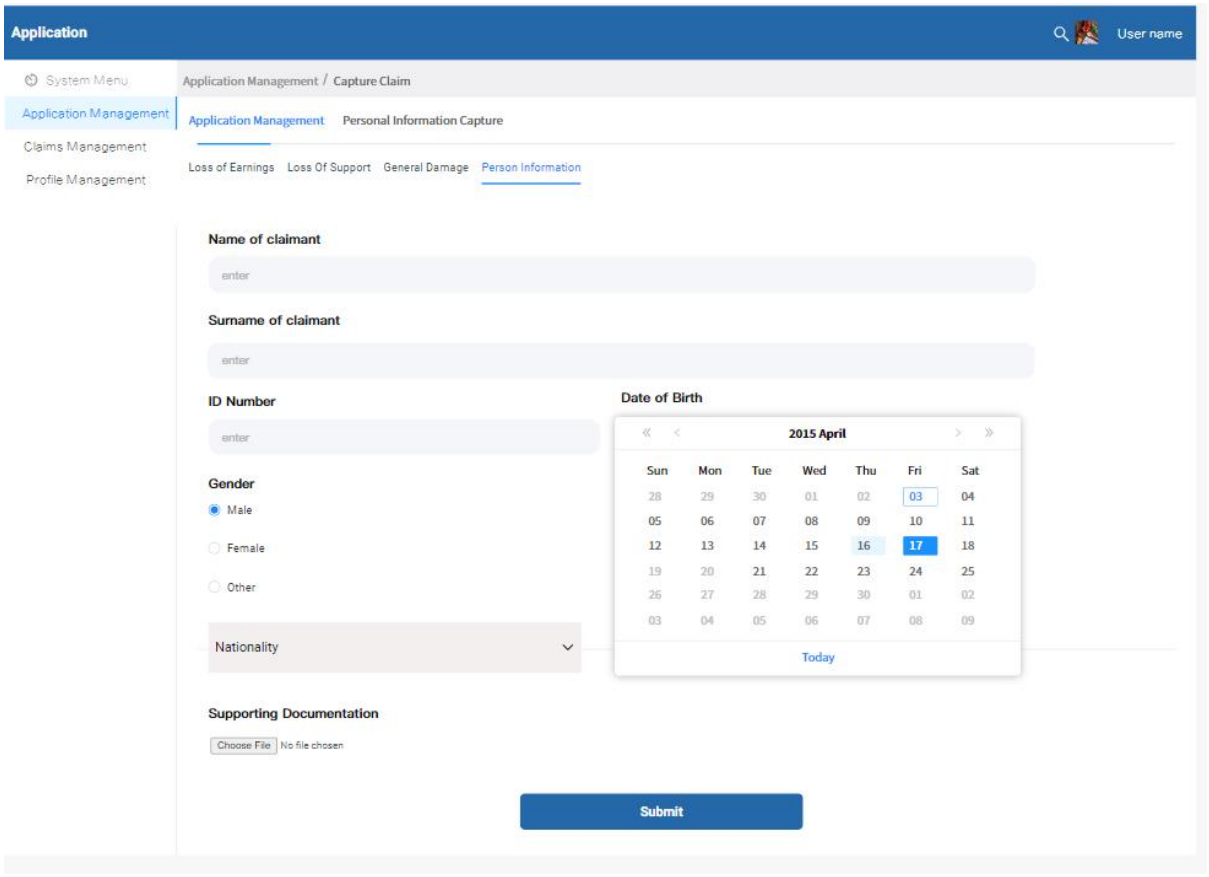

Figure 55: User Guide Personal Information form input

508. Personal Information

508.1. Name of the claimant. (This field is a free text field; the user needs to type in their name using the device keyboard.)

508.2. Surname of the claimant (This field is a free text field; the user needs to type in their surname using the device keyboard.)

508.3. ID Number of the claimant. (This field is a free text field; the user needs to type in their ID number using the device keyboard.)

508.4. Date of birth of the claimant. (This field is a picklist field; the user needs to select the date on the calendar provided. The format of the date is yyyy-mm-dd)

`

508.5. Gender of the claimant. (This field is a picklist field; the user needs to select their gender on the list provided. The list is male and female.)

508.6. Nationality of claimant. (This field is a picklist field; the user needs to select their nationality on the list of countries provided.

508.7. Support documents (optional)(This field is a file upload field; the user need to click on choose file then they select the documents they would like to submit.)

509. Functionality

509.1. Users select the appropriate column based on their role as either the main claimant or the beneficiary/dependent.

509.2. Within each column, users can enter relevant details and information related to their claim, such as the ones mentioned above.

Submission

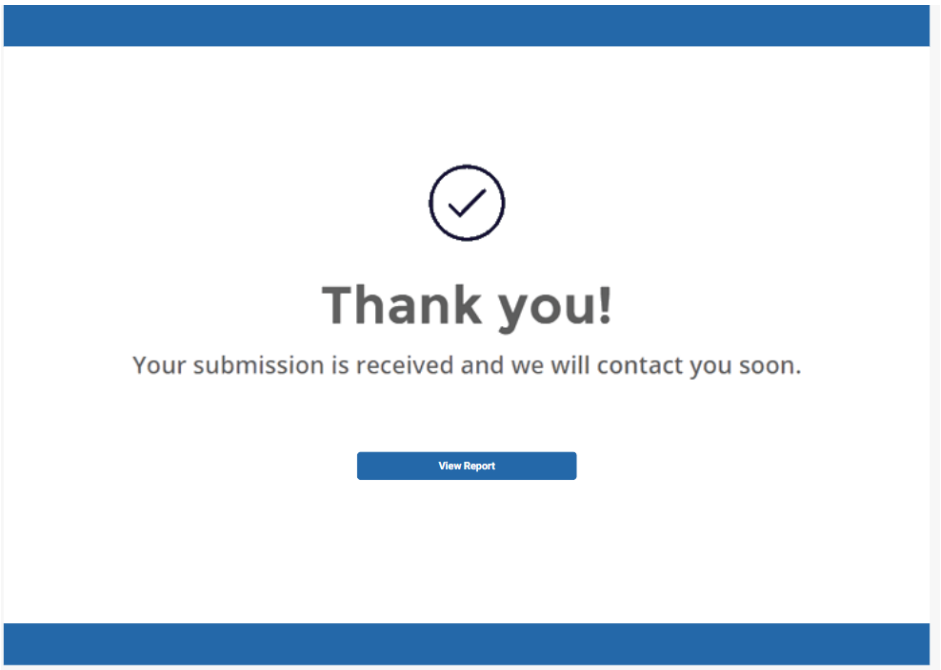

Figure 56: User Guide Submission

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509.3. Once all necessary information is entered, users can submit the claim for processing within the system. The submission page appear that has a view report button which will direct them to the report page which will give a summary of the submitted application.

510. Conclusion

510.1. The Capture Claim screen streamlines the process of submitting new claims within the Road Accident Fund system, providing users with a straightforward and efficient way to seek compensation for their losses or damages.

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User Guide: Report Page

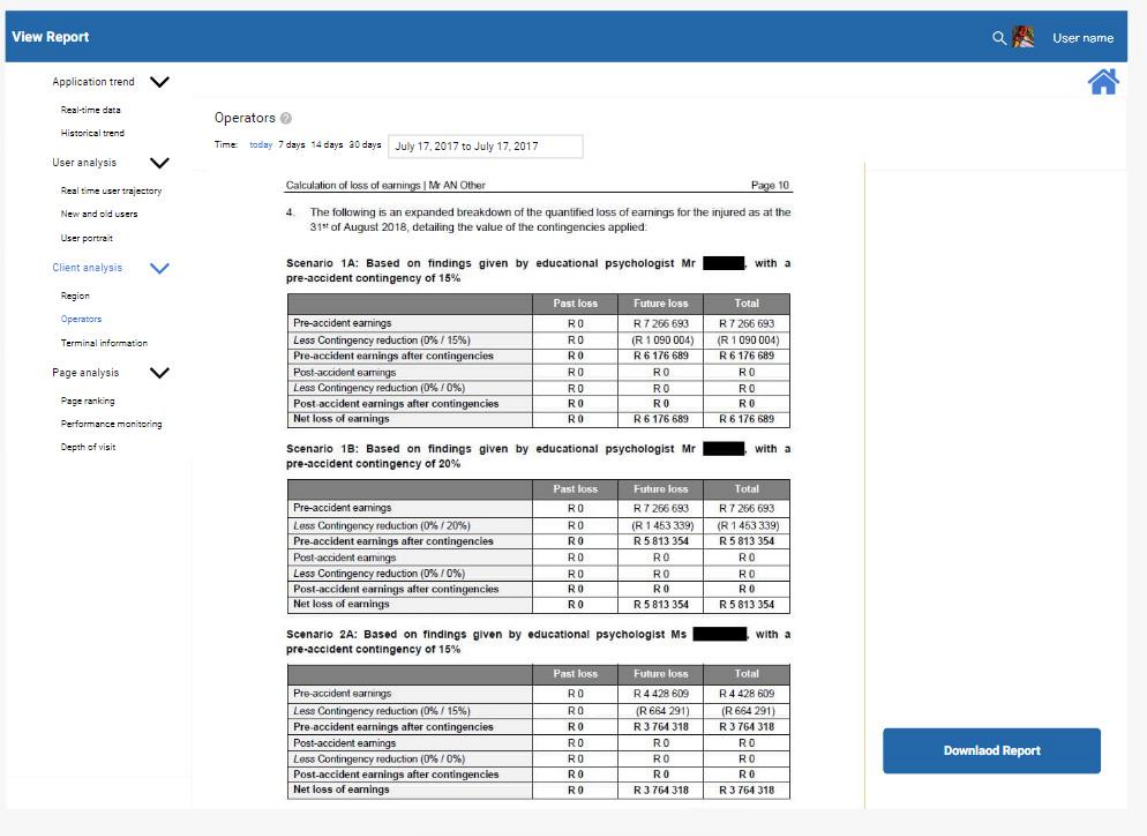

Figure 57: User Guide Report

511. Introduction

511.1. The Report Page provides users with access to detailed reports and assessments related to their claims within the Road Accident Fund system

512. Accessing Reports

512.1. Users can access the Report Page by clicking on the "View Report" option within the Application Management screen

513. Layout

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513.1. The Report Page features comprehensive information and assessments regarding the user's claim.

513.2. Users can navigate through the report using the menu on the left side of the screen.

514. Functionality

514.1. Users have the option to download the report for offline viewing or reference.

515. Conclusion

515.1. The Report Page offers users access to vital information and assessments regarding their claims, empowering them with the knowledge needed to navigate the claims process effectively within the Road Accident Fund system.

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CHAPTER 7: APPENDICES

APPENDIX A: TECHNICAL LOSS OF EARNINGS

A.1. Current Practice

A.1.1. The current practice by RAF is to apply certain assumptions on projections of future potential earnings. The current solution of Loss of Earnings can be summarised technically as a function of an IP report by the formula:

$$LoE_x^{WPI} = f(IP)_x - f(IP)_x^{WPI}$$

Figure 58: Current Practice Formula

Where

$$x = age\ of\ individual\ on\ day\ of\ accident.$$

LoE_x^{WPI}
$= Present\ value\ of\ a\ loss\ of\ pojected\ earnings\ until\ ERA\ of\ an\ indidual\ who\ suffered\ injuries$
$at\ a\ defined\ level\ of\ WPI\ resulting\ from\ a\ South\ African\ Road\ accident.$

$f(IP)_x$
$= Present\ value\ of\ future\ earning\ projected\ until\ ERA\ from\ the\ IP\ report\ of\ an\ individual\ aged\ x$

$f(IP)_x^{WPI}$
$= Present\ value\ of\ future\ earning\ projected\ until\ ERA\ from\ the\ IP\ report\ of\ an\ individual\ aged\ x$
$with\ a\ defined\ level\ of\ WPI\ due\ to\ injuries\ sustained\ in\ a\ South\ African\ road\ accident.$

A.1.2. That is, it is necessary for RAF to change its current functional form of LoE_x^{WPI}.

`

A.2. Proposed Solution

$$E[LoE_x^{WPI}] = \sum_{t=1}^{ERA} (pv(\boldsymbol{PE}_{x+t}) \times {}_t\boldsymbol{Pr}_x - pv(\boldsymbol{EP}_{x+t}^{WPI}) \times {}_t\boldsymbol{Pr}_x^{WPI}).$$

Figure 59: Proposed Solution Formula

Where,

$pv(\boldsymbol{PE}_{x+t}) = Present\ value\ of\ expected\ earnings\ of\ an\ individual\ in\ South\ Africa\ age\ x+t\ .$

${}_t\boldsymbol{Pr}_x = Probability\ of\ an\ individual, aged\ x+t\ in\ South\ Africa, to\ earn\ an\ amount\ of E_{x+t}\ .$

$pv(\boldsymbol{PE}_{x+t}^{WPI})$
$= Present\ value\ of\ expected\ earnings\ at\ time\ t\ of\ an\ individual\ with$ a defined level of WPI $as\ a\ result\ of\ injuries\ sustained\ in\ a\ South\ African\ road\ accident\ while\ age\ x.$

${}_tp_x^{WPI}$
$= Probability\ of\ an\ individual, with\ a\ defined\ level\ of\ WPI\ as\ a\ result\ of\ injuries\ sustained\ in\ a\ South\ African\ road\ accident\ while\ aged\ x, to\ earn\ an\ amount\ of\ \boldsymbol{PE}_{x+t}^{WPI}\ after\ t\ years.$

$$\sum_{t=1}^{ERA}(.) = sum\ of\ all\ objects\ from\ t = 1\ until\ ERA.$$

Figure 60: Proposed Solution Derivation

`

A.2.1. Cashflow projections

A.2.1.1. In the proposed solution of LoE, $pv(\boldsymbol{PE}_{x+t})$ is a representation of the present value of pre-accident cashflow projections. While $pv(\boldsymbol{PE}_{x+t}^{WPI})$ is a representation of the present value of post-accident cashflow projections.

A.2.1.2. Evidence based cashflow projections of any individual with a given age and WPI depends on several factors, such as:

A.2.1.3. The individual's average earnings in South Africa,

A.2.1.4. The individual's ERA,

A.2.1.5. The individual's level of WPI that they live with.

A.2.1.6. A proposed functional representation of $pv(\boldsymbol{PE}_{x+t})$ is thus,

$$pv(\boldsymbol{PE}_{x+t}) = \boldsymbol{PE}_{x+t} \times v^t.$$

Figure 61: Proposed Solution Derivation

Where,

$\boldsymbol{PE}_{x+t} = Expected\ earnings\ of\ an\ individual\ aged\ x + t\ in\ South\ Africa.$

$v^t = is\ a\ discount\ factor\ based\ on\ short\ term\ interest\ rates\ application\ over\ a\ period\ of\ time\ t.$

A.2.1.7. A proposed functional representation of $pv(\boldsymbol{PE}_{x+t}^{WPI})$ is thus,

$$pv(\boldsymbol{PE}_{x+t}^{\alpha}) = \boldsymbol{PE}_{x+t}^{\alpha} \times v^t.$$

Figure 62: Proposed Solution Derivation

`

Where,

α *represents the defined level of WPI,*

$\boldsymbol{PE}_{x+t}^{\alpha} = expected\ earnings\ at\ time\ t\ of\ an\ individual\ with\ WPI\ of\ \alpha\ after\ suffering\ certain\ injuries\ resulting\ from\ a\ South\ African\ road\ accident\ while\ aged\ x$

${}_t\boldsymbol{Pr}_x^{\alpha}$
$= Probability\ of\ an\ individual\ aged\ x\ with\ WPI\ of\ \alpha\ to\ survive\ t\ year\ in\ South\ Africa\ with\ WPI\ fixed\ at\ \alpha.$

$v^t = is\ a\ discount\ factor\ based\ on\ short\ term\ interest\ rates\ application\ over\ a\ period\ of\ time\ t.$

A.2.2. **Average earnings in South Africa**

A.2.2.1. Expected earnings by an individual depend on their ability to earn some amounts of money.

A.2.2.2. Technically, the individual's ability to earn can be represented as the probability of that individual earning some specified amount of money.

A.2.2.3. The proposed functional form of average earnings by an individual age $x + t$ can thus be represented as,

$$\boldsymbol{PE}_{x+t} = \sum_{j=1}^{n} e_j \ \ \boldsymbol{Pr}_j(employment|school)$$

$$\boldsymbol{PE}_{x+t}{}^{\alpha} = \sum_{j=1}^{n} e_j \ \ \boldsymbol{Pr}_j{}^{\alpha}(employment|school)$$

Figure 63: Proposed Solution Derivation

`

A.2.2.4. Consequently, the proposed present value of pre-accident cashflows projection of an individual in South Africa age $x+t$ and can be represented functionally in the form,

$$pv(\boldsymbol{PE}_{x+t}) = \boldsymbol{PE}_{x+t} \times v^t \times {}_t\boldsymbol{Pr}_x$$
$$= \sum_{j=1}^{n} e_j \ \boldsymbol{Pr}_j(employment|school) \times {}_t\boldsymbol{Pr}_x \times v^t$$

Figure 64: Proposed Solution Derivation

A.2.2.5. Consequently, the proposed present value of post-accident cashflows projection of an individual in South Africa age $x+t$ and can be represented functionally in the form,

$$pv(\boldsymbol{PE}_{x+t}{}^{\alpha}) = \boldsymbol{PE}_{x+t}{}^{\alpha} \times v^t \times {}_t\boldsymbol{Pr}_x{}^{\alpha}$$
$$= \sum_{j=1}^{n} e_j \ \boldsymbol{Pr}_j{}^{\alpha}(employment|school) \times {}_t\boldsymbol{Pr}_x{}^{\alpha} \times v^t$$

Figure 65: Proposed Solution Derivation

A.2.2.6. Consequently, functional form of the proposed solution can be standardised by the following in terms of the following:

$$E[LoE_x^{\alpha}] = \sum_{t=1}^{ERA} [pv(\boldsymbol{PE}_{x+t}) \times {}_t\boldsymbol{Pr}_x$$
$$- pv(\boldsymbol{PE}_{x+t}^{\alpha}) \times {}_t\boldsymbol{Pr}_x^{\alpha}]$$
$$= \sum_{t=1}^{ERA} \left[\sum_{j=1}^{n} e_j \times \ \boldsymbol{Pr}_j(employment|school) \times {}_t\boldsymbol{Pr}_x \right.$$
$$\left. - \sum_{j=1}^{n} e_j \times \ \boldsymbol{Pr}_j^{\alpha}(employment|school) \times {}_t\boldsymbol{Pr}_x^{\alpha} \right].$$

Figure 66: Proposed Solution Derivation

`

APPENDIX B: GENERAL DAMAGES SOLUTION OPTIONS CONSIDERED

B.1. The issue of warding general damages is highly contentious for many reasons as we outline in various parts of this document. Different schools of thought exist that are often at polar ends of the spectrum in regard to the final approach that should be implemented.

B.2. Certain scholars believe that the AMA guides should be the bible without which no impairment can be adequately assessed in order to establish impairment at a whole person level. Other scholars recommend that subjective test will better elicit the impact of the injury on the person.

B.3. The methods of assessment, generating a fair system of compensation is particularly contentious in South Africa and for the Road Accident Fund that various approaches can be considered and no one approach is completely error-proof and various motivations can be used to select any which one.

B.4. Therefore, we have developed options for the Fund to reflect upon and select the most appropriate for the Fund in line with the future strategic direction the Fund wishes to operate as well as the overall policy direction for social compensation schemes in the Republic.

Solution Option 1:

B.5. This solution will retain the SI list as is and create a standardisation that addresses the following goals outlined in Solution 1- 1) Mapping of SI to WPI; 2) Adding an Addendum that addresses potential injuries in Narrative Test based on Regulation 3(1)(b)(iii); 3) Determine Confounders and develop modifiers for them and 4) Determine a monetary award calculation for Value of Life, Pain and Suffering for each injury.

Solution Option 2:

B.6. This solution will retain the WPI as the supreme methodology for assessing impairment and create a list of injuries in category 1-3 that map to a WPI of 30-50%, 50-70% and >70%as defined in the AMA guides; 2) Adding a list of potential injuries that is also mapped to WPI that cover the 4 conditions in the Narrative Test based on Regulation

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3(1)(b)(iii); 3) Determine Confounders and develop modifiers for them and 4) Determine a monetary award calculation for Value of Life, Pain and Suffering for each injury.

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Standardisation Framework Outline

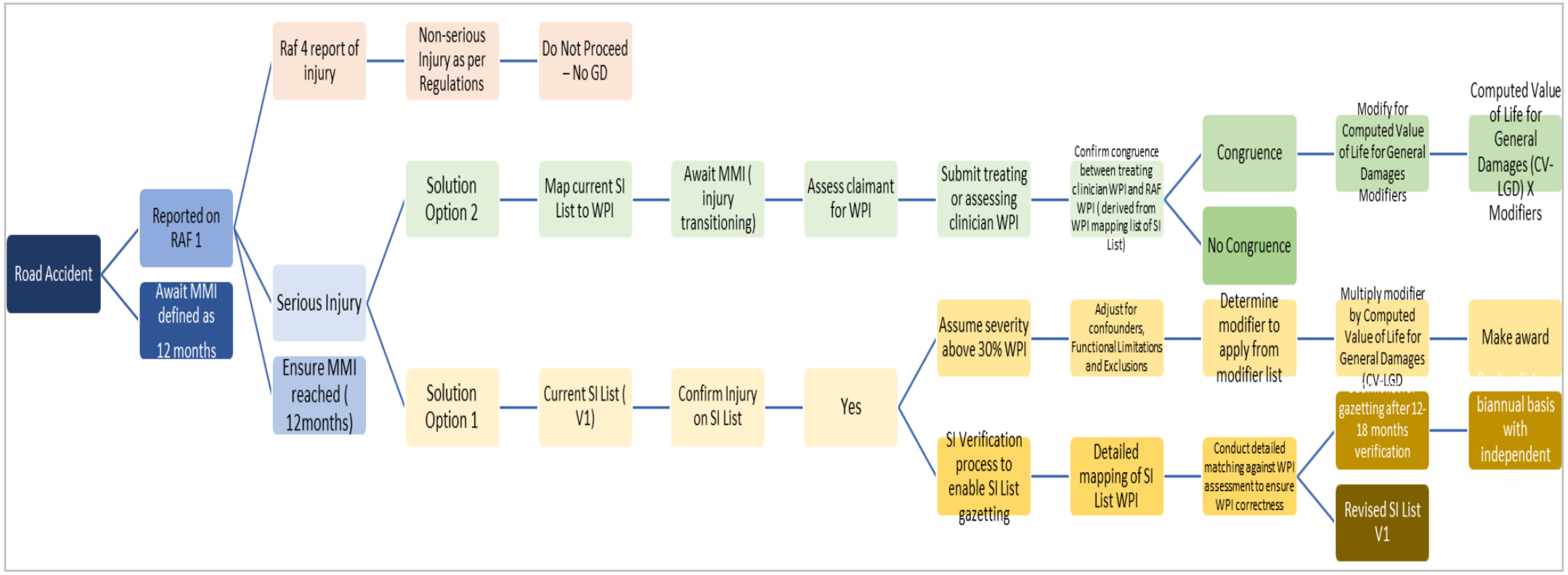

Figure 6721: Schematic for the Standardisation Framework illustrating the various Solution Options for GDs

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Solution Option 1

B.7. Solution 1 Goals

B.7.1. Goal 1

Adopt the current RAF Serious Injuries (SI) list in its current form and incorporate this as an accepted baseline standard to create a starting point for the assignment of the seriousness status of injuries.

B.7.2. Goal 2[33]

B.7.2.1. Undertake a mapping of the SI list injuries List and Addendum List Injuries to a WPI scale whereby design those injuries would compute a WPI ≥ 30%.

B.7.2.2. This is critical to enable the Revised Injuries List credibility. In the alternative, should there be a significant lack of internal consistency, this finding may support the repudiation of the AMA Guides as a tool for assessing impairment.

B.7.3. Goal 3

B.7.3.1. Establish evidence-based guidance on injury specific timelines from **date of injury to expected time of MMI** for the Revised Serious Injuries List.

B.7.3.2. This will be used as a tool to inform presumptuous assignment of WPI when the injury cannot be considered to have reached MMI, this is particularly relevant for disputed case and other cases where the assessor prefers the use of the AMA Guides as a reference point to establish level of impairment.

B.7.3.3. Secondarily, this may be used as a guide to inform claim prescription, e.g., if the claim must prescribe at 5 year since date of injury, the system driven MMI date linked to the

[33] Due to the complex nature of Goal 3, this particular deliverable may, in agreement with the RAF, be deferred for Phase 2.
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type of injury can be used as a basis for condoning a late claim or justifying lack of condonation if MMI has long been reached.

B.7.4. Goal 4

B.7.4.1. Develop a system or mechanism utilising historical claims data to account for injuries with Whole Person Impairment (WPI) less than 30% but would meet the threshold if accompanied by a condition on the current "narrative test list"[34] that will become an addendum (Addendum 2 (Work-in-Progress)) to the SI List representative of possible Narrative Injuries

B.7.4.2. Should the Revised SI List to WPI mapping process not yield the expected outcome[35], injuries on the revised list will be mapped against a sample of previously adjudicated cases

B.7.5. Goal 5

B.7.5.1. Conduct literature research and provide for a list of confounders or variables that need to be factored in establishing the percent WPI at MMI. Examples of potential confounders: Age, Pre-existing Medical Conditions (comorbid medical conditions), Pre-existing Impairment; and Negligent Medical Care.

B.7.5.2. Develop an adjustment methodology for said the confounders list such that if %WPI at MMI is X, then the final WPI after adjustment is Y[36]

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[34] Regulation 3(1)(b)(iii):

> An injury which does not result in 30 per cent or more Impairment of the Whole Person may only be assessed as serious if that injury:
>
> (aa) resulted in a serious long-term impairment or loss of a body function;
> (bb) constitutes permanent serious disfigurement;
> (cc) resulted in severe long-term mental or severe long-term behavioural disturbance or disorder; or
> (dd) resulted in loss of a foetus.

[35] The expected outcome is that a specified injury should yield the same level of impairment (i.e., same WPI percentage) across different subjects.

[36] The impact of the confounder may be non-linear such that in some instances the Final WPI may a product i.e. an adjustment factor. Different confounders may require different adjustment criteria such the final formula is derived as a composite of various adjustment factors.

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$$Y = \sum_{\substack{1 \le i \le j \\ i = Assessed\ WPI \\ j = confounder\ impact}} WPI(i,j)$$

Figure 68: Solution 1 Formula

where Y is the Final WPI

B.7.6. Goal 6

B.7.6.1. Develop specific guidelines for considering the synergistic impact on overall impairment of polytrauma that individually would not meet a WPI of 30%.

B.7.7. Goal 7

B.7.7.1. The final goal is to calculate a monetary value of the injury(ies) in line with the injury, its severity its impairment and adjusting for confounders or pre-existing medical injuries.

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B.8. Detailed Outline of Solution Option 1

B.8.1. Goal 1:

B.8.1.1. Adopt the current RAF Serious Injuries (SI) list in its current form and incorporate this as an accepted baseline standard to create a starting point for the assignment of the seriousness status of injuries.

B.8.2. Goal 2:

B.8.2.1. Map the SI List to WPI grading to confirm the alignment of the SI list to accepted and prescribed assessment based on WPI scores.

B.8.2.2. Conflating impairment with disability:

B.8.2.3. Measures of impairment are fundamentally different from measures of disability. Two persons with identical injuries will have the same impairment score but may be assessed at drastically different levels of disability. For example, a professional piano player and an administrator may each lose their fifth digit (little finger). Their impairment rating could be identical; however, the professional piano player will be left with a significant impact on their earning capacity, while the administrator will probably see a minimal effect in their work performance. Impairment compensation relates solely to the effect of the injury on the body, while disability compensation includes the injury's specific effect on employment, social and recreational performance.

B.8.2.4. Currently there are significant disparities of impairment ratings and post injury settlements raising fundamental questions about social justice with the assessment determination processes.

B.8.2.5. Impairment[37]:

[37] American Medical Association. Guides to the Evaluation of Permanent Impairment. 6th ed. American Medical Association; 2008.
World Health Organization. International Classification of Functioning, Disability and Health (ICF). World Health Organization; 2001. Available at: https://www.who.int/standards/classifications/international-classification-of-functioning-disability-and-health.
`

a. Impairment refers to any loss or abnormality of psychological, physiological, or anatomical structure or function. It is a medical term used to describe the physical or mental limitations resulting from injury, illness, or congenital conditions.

b. Impairment is typically assessed by healthcare professionals through clinical examination, diagnostic tests, and medical history review.

c. Examples of impairment include loss of limb function, reduced range of motion in a joint, cognitive deficits, or sensory impairments.

B.8.2.6. Disability[38]:

a. Disability, on the other hand, refers to the limitation or restriction of activity or participation in society resulting from impairment. It encompasses the broader impact of impairment on an individual's ability to perform daily tasks, engage in work, participate in social activities, and fulfil roles within their community.

b. Disability is influenced not only by the severity of impairment but also by environmental factors, societal attitudes, and individual coping strategies.

c. Disability is often assessed through functional evaluations, such as assessing an individual's ability to perform specific tasks or activities of daily living.

d. Disability can be temporary or permanent, partial or total, and may vary in severity over time.

[38] World Health Organization. International Classification of Functioning, Disability and Health (ICF). World Health Organization; 2001. Available at: https://www.who.int/standards/classifications/international-classification-of-functioning-disability-and-health. Institute of Medicine (US) Committee on Disability in America. The Future of Disability in America. National Academies Press; 2007. doi: 10.17226/11898.
`

Table 14: Sample of the Serious Injury Mapping Process

Coded number	Main Categories	WPI Upper Range
1	Injuries to the Upper Limb:	
1.1	Fracture of shoulder and upper arm:	
S42.21	Fracture of upper end of humerus	Complicated, unstable, or infected
S42.81	Fracture of other parts of shoulder and upper arm	28% WPI if completely dysfunctional
1.2	Injury of nerves at shoulder and upper arm level:	
S44.0	Injury of ulnar nerve at upper arm level	Entrapments differ from total transaction
S44.1	Injury of median nerve at upper arm level	Entrapments differ from total transaction, Pure Median = 27%
S44.2	Injury of radial nerve at upper arm level	Entrapments differ from total transaction
S44.3	Injury of axillary nerve	21%WPI Max
S44.4	Injury of musculocutaneous nerve	25UEI% and 15%WPI MA
S44.7	Injury of multiple nerves at shoulder and upper arm level	Brachial Plexus maximum 100%UEI = 60% WPI but can be as little as 1%

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1.3	Injury of blood vessels at shoulder and upper arm level:	
S45.0	Injury of axillary artery	Acute Only Condition and MMI different. Function?
S45.1	Injury of brachial artery	Acute Only Condition and MMI different. Function?
S45.7	Injury of multiple blood vessels at shoulder and upper arm level	Acute Only Condition and MMI different. Function?
1.4	Injury of muscle and tendon at shoulder and upper arm level:	
S46.7	Injury of multiple muscles and tendons at shoulder and upper arm level	ROM may not exceed the Above in Row 7
1.5	Crushing injury of shoulder and upper arm:	
S47	Crushing injury of shoulder and upper arm	ROM may not exceed the Above in Row 7, however consider each regional function
1.6	Traumatic amputation of shoulder and upper arm:	
S48.0	Traumatic amputation at shoulder joint	60% WPI
S48.1	Traumatic amputation at level between shoulder and elbow	>30 % %

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S48.9	Traumatic amputation of shoulder and upper arm, level unspecified	30 - 60% WPI
1.7	Injury of nerves at forearm level:	
S54.0	Injury of ulnar nerve at forearm level	Max 35 UEI <20 WPI
S54.1	Injury of median nerve at forearm level	Max 45UEI Max 27WPI
S54.2	Injury of radial nerve at forearm level	21 % Max
S54.7	Injury of multiple nerves at forearm level	Combinations may exist. Each assessed individually
1.8	Injury of blood vessels at forearm level	
S55.0	Injury of ulnar artery at forearm level	PVD Max 39%WPI, can be as low as 0% in isolation
S55.1	Injury of radial artery at forearm level	PVD Max 39%WPI, can be as low as 0% in isolation
S55.7	Injury of multiple blood vessels at forearm level	PVD Max 39%WPI, can be as low as 0% in isolation

`

B.8.3. Goal 3:

B.8.3.1. Establish evidence based rehabilitative periods or timeline for MMI linked to accepted medical guidance to healing and rehabilitative period by system.

B.8.3.2. Establish that the third party has indeed reached MMI.

B.8.3.3. Based on researched rehabilitative periods a MMI of 12 months as indicated in RAF 4 is within acceptable norms

B.8.3.4. Impairment Assessment and Maximal Medical Improvement (MMI):

B.8.3.5. Impairment ratings are typically performed after the third party attains "maximum medical improvement", a point at which medical recovery from the injury has reached a plateau with no foreseeable significant improvement expected in the person's future notwithstanding appropriate medical care.

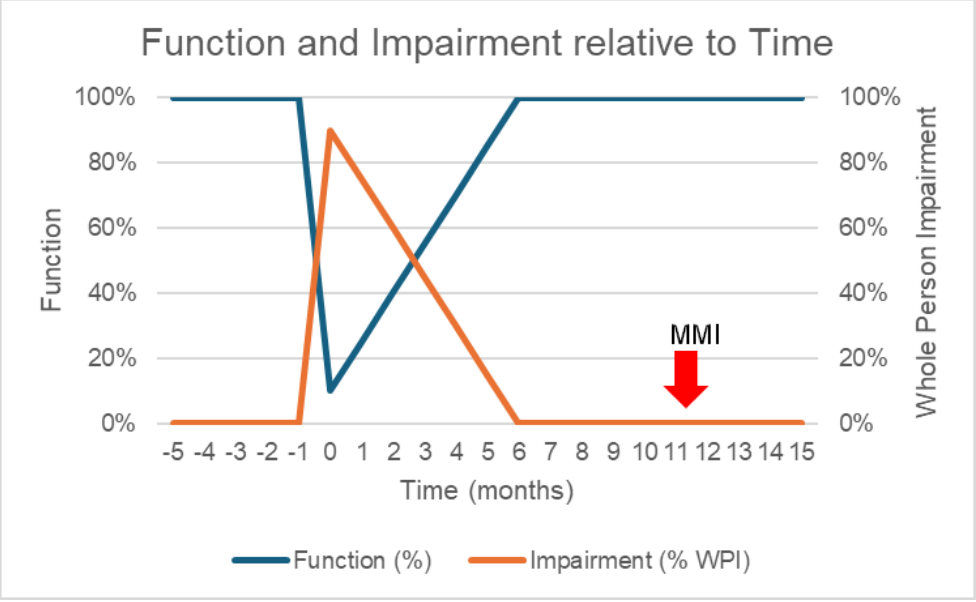

Figure 69: Recovery graph illustrating "no impairment at MMI[39]**"**.

[39] This figure demonstrates injury recovery for an individual who shows no signs of impairment. An injured individual may show impairment at the time of the injury, but after a recovery period may show no signs of impairment.
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B.8.3.6. The point at which the persons starts to plateau after which no further “significant” improvement is expected is referred to as the point where MMI has been reached. This doesn't necessarily mean that the individual has fully recovered or that they are back to their pre-injury state; rather, it indicates that their condition has stabilised.

B.8.3.7. MMI is typically determined by a medical practitioner based on clinical evaluation, diagnostic tests, and medical records. The practitioner assesses the individual's medical condition, functional limitations, and prognosis to determine if further medical treatment is likely to result in meaningful improvement.

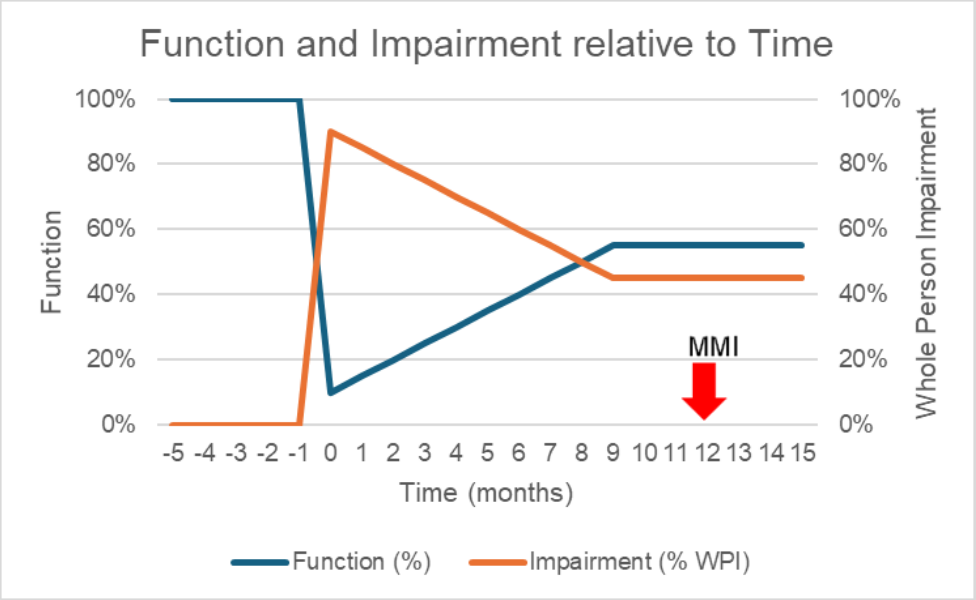

Figure 70: Recovery graph illustrating "45% whole person impairment at MMI

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Table 15: Sample of Average Rehabilitative Period

Body System	Average Rehabilitative Period till MMI	Source of reference
Injuries to the Upper Limb	6 weeks to several months, depending on severity	TBA
Injuries to the Lower Limb	6 weeks to several months, depending on severity	S. Poiraudeau, F. Rannou et al.[40] Bendix T, Bendix AF et al.[41]
Injuries to the Thorax	Weeks to months for respiratory rehabilitation, particularly after severe lung injuries or surgeries.	TBA
Injuries to the Abdomen and Pelvis	6 weeks to several months, depending on severity	TBA
Injuries to the Head and Face	Rehabilitation periods vary weeks - months.	TBA
Injuries to the Spine	Highly variable, from a few weeks for minor nerve injuries to several years for complex neurological rehabilitation after spinal cord injuries or traumatic brain injuries.	TBA

[40] S. Poiraudeau, F. Rannou, M. Revel. Functional restoration programs for low back pain: a systematic review. Annales de Réadaptation et de Médecine Physique, Volume 50, Issue 6, 2007, Pages 425-429, ISSN 0168-6054, https://doi.org/10.1016/j.annrmp.2007.04.009.
(https://www.sciencedirect.com/science/article/pii/S0168605407001237)
[41] Functional restoration in chronic low back pain. T. Bendix, A. F. Bendix, E. Busch, A. Jordan, Tom Bendix MD. First published: April 1996. https://doi.org/10.1111/j.1600-0838.1996.tb00076.x

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Mental Health Disorders classified as Serious Injuries	Highly variable, especially in cases of post-traumatic stress disorder (PTSD) or emotional trauma. Psychosocial rehabilitation may involve therapy and support over an extended period.	TBA
Integumentary System (Skin)	Weeks to months for wound healing and scar management. Extensive burn injuries may require longer-term rehabilitation.	TBA

B.8.4. Goal 4:

B.8.4.1. The legislation for assessment of injuries allows a subjective assessment where the injury is 1) not listed on the "non serious injuries" list, and 2) where the injury is considered to have resulted in less than 30 per cent of WPI. In this case the medical practitioner should apply the "narrative test". According to this test the medical practitioner should consider if the injury has resulted in any of the following consequences: "1) serious long-term impairment or loss of a body function, 2) permanent serious disfigurement, 3) severe long-term mental or severe long-term behavioural disturbance or disorder, or 4) the loss of a foetus".

B.8.4.2. There are however reasons to question the application of the narrative test based on observations in reviews of use.

B.8.4.3. Recommendations:

a. Structured Objective Guideline for Application of Narrative

b. International Classification of Functioning, Disability and Health (ICF).

c. Classification of health and health-related domains as the functioning and disability of an individual occurs in a context.

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d. WHO framework for measuring health and disability

e. ICF enables documentation at a higher level of detail.

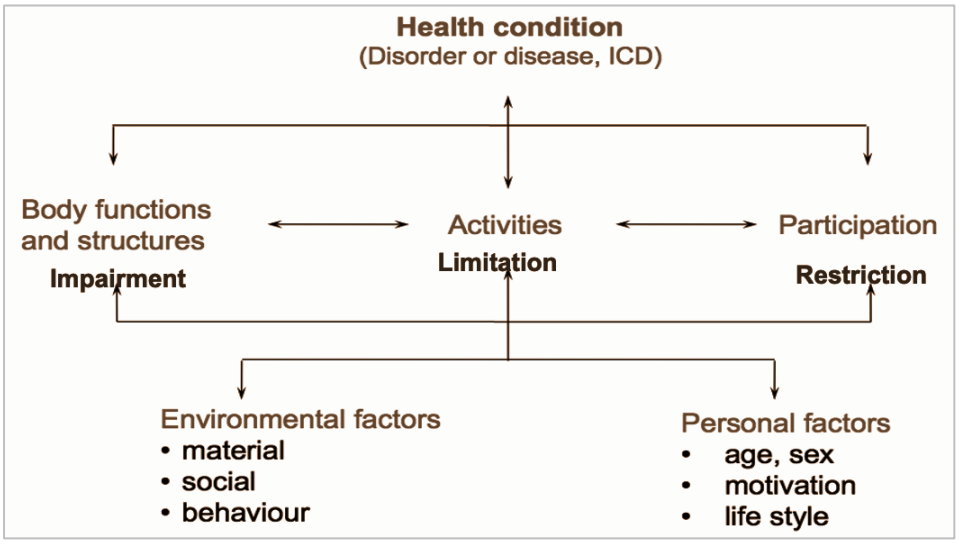

Figure 71: The ICF Model: Interaction between ICF components

f. Application of the model.

g. Patient functional history assessed for basic ADLs

h. Self-reporting functional assessment tools report

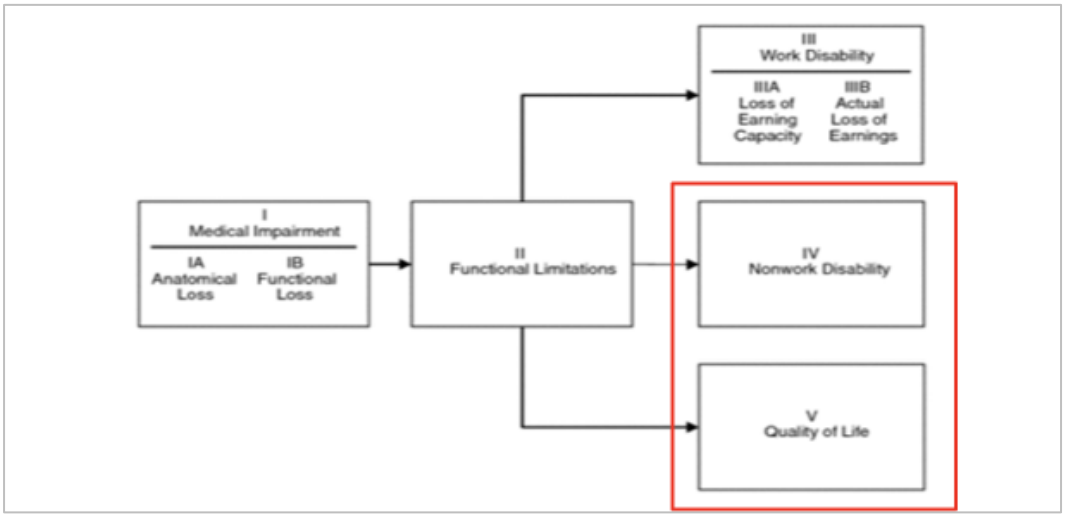

Figure 72: Self-reported functional assessment component.

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Table 16: Sample of impairment functional classification

Sample impairment functional classification			
Grade		Functional Class	ICF codes and functional levels[42]
	Slabbert and Edeling[43]	Functioning and disability associated with these health conditions	
0	Normal – 0 percent	No symptoms with strenuous activity (independent)	no problem: The person has no problem at any time or only very infrequently.
1	Class 1 - Mild abnormalities – 1 percent to 10 percent - defined as "Alteration in MSCHIF but patient is able to assume all usual roles and perform ADLs"	Symptoms with strenuous activity; no Symptoms with normal activity Symptoms with normal activity (independent) (independent)	Mild problem: The problem is present less than 25% of the time, with a tolerable intensity, and has only rarely occurred in the last thirty days.
2	Class 2 - Moderate abnormalities – 11 percent to 20 percent - defined as "Alteration in	Symptoms with normal activity (independent)	Moderate problem: The problem is present between 25% and 50% of the time, with an

[42] ICF is WHO's framework for health and disability. ICF classifies functioning and disability associated with health conditions. It is the conceptual basis for the definition, measurement and policy formulations for health and disability. It is a universal classification of disability and health for use in health and health related sectors.

[43] Slabbert, M., & Edeling, H. J. (2017). The Road Accident Fund and serious injuries: the narrative test. *Potchefstroom Electronic Law Journal*, *15*(2), 267–290. https://doi.org/10.17159/1727-3781/2012/v15i2a2488

	MSCHIF that interferes with ability to assume some normal roles or perform ADLs		intensity that sometimes interferes with daily life.
3	Class 3 - Severe abnormalities – 21 percent to 35 percent - defined as "Alteration in MSCHIF that significantly interferes with ability to assume normal roles or perform ADLs	Symptoms with minimal activity (partially dependent)	Severe problem: The problem is present between 50% and 95% of the time, with an intensity that occurs frequently and partially alters daily life.
4	Class 4 - Most profound abnormalities – 36 percent to 50 percent - defined as "Alteration in MSCHIF that prohibits performance of normal roles or performance of ADLs	Symptoms at rest (totally dependent) (totally dependent)	Complete problem: The problem is present more than 95% of the time, with an intensity that totally alters daily life.

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i. Expert Stakeholder Engagement

j. Engagement and Opinion piece of relevant stakeholders to determine relevance of subjective assessment tools in injury assessment, classification and severity grading to ensure alignment with global standards and legal requirements

k. Roadshow on Interpretation of Serious Injuries

l. Additional training in the interpretation of serious injuries in the South African context

m. Provided by South African experts under the auspices of an independent body (same body to conduct biannual reviews of award caps)

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B.8.5. Goal 5:

B.8.5.1. Correction for Pre-Existing Impairment, Confounders and Underlying Medical Conditions

B.8.5.2. Managing Confounders to Impairment Assessment:

B.8.5.3. There are scenarios where a person has a pre-existing impairment that results in a lower functional score at the time immediately preceding injury and even with maximal recovery, pre-existing loss of function cannot exceed the starting point level of function.

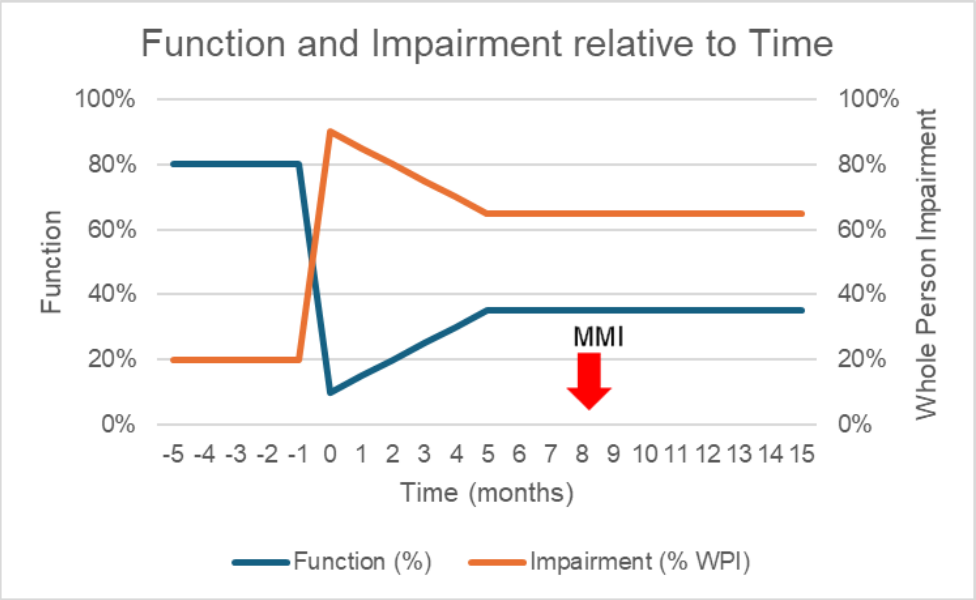

Figure 7322: Recovery graph illustrating pre-existing loss of function (20% WPI before the injury) and "65% whole person impairment at MMI".

B.8.5.4. Another medical phenomenon that commonly impacts impairment at MMI may be a departure from the expected pattern and level of the person's recovery.

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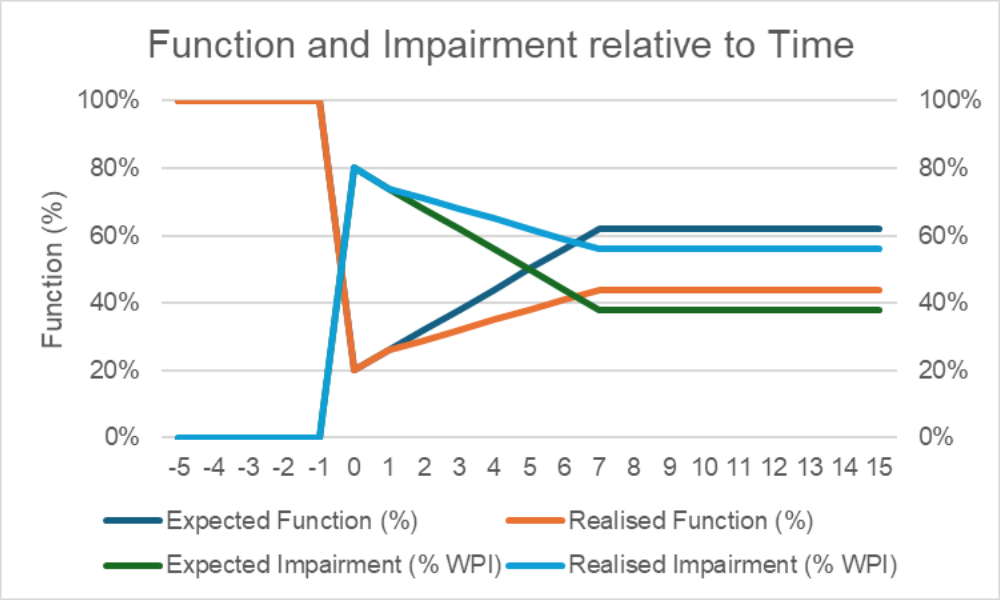

Figure 74: Recovery graph illustrating expected versus realised loss of function showing 38% expected WPI versus 56% Realised WPI at MMI"

B.8.5.5. There are specific factors that my impact a person's ability to recover fully in line with what would be expected in other subject, these factors may be – age, pre-existing medical condition (e.g. diabetes), quality of medical care provided, compliance with treatment etc.).

B.8.5.6. Implement a systematic approach to identify and account for confounding factors that may influence the assessment, such as pre-existing conditions or lifestyle factors.

B.8.5.7. Include a thorough review of the injured individual's medical history to differentiate between injuries directly resulting from the accident and those related to pre-existing impairments conditions to enable application of a modifying factor.

B.8.5.8. Engage medical professionals to provide insights into the impact of underlying health conditions on the severity of injuries sustained.

B.8.5.9. Utilise statistical models and expert input to adjust compensation calculations for confounders, ensuring fairness and accuracy.

B.8.6. Goal 6:

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B.8.6.1. Develop specific guidelines for addressing poly trauma cases, where multiple severe injuries occur simultaneously, by considering the synergistic impact on overall impairment.

B.8.6.2. Polytrauma Definition: Polytrauma is clinically defined as the simultaneous occurrence of severe injuries involving multiple body regions, with the severity of each injury assessed using the Abbreviated Injury Scale (AIS). Specifically, polytrauma is universally accepted to be defined[44] "as cases with an Abbreviated Injury Scale (AIS) $\geq$ 3 for two or more different body regions and one or more additional variables from five physiologic parameters (hypotension [systolic blood pressure $\leq$ 90 mmHg], unconsciousness [Glasgow Coma Scale score $\leq$ 8], acidosis [base excess $\leq$ −6.0], coagulopathy [partial thromboplastin time $\geq$ 40 s or international normalised ratio $\geq$ 1.4], and age [$\geq$70 years]).

B.8.6.3. This definition has been validated in high-income countries and has application in resource-limited settings such as South Africa[45] for polytrauma patients in the acute setting as well.

B.8.6.4. Although this is an acute stage definition, it provides a consistent and repeatable clinical diagnostic criterion to apply as a confirmation of polytrauma.

B.8.6.5. The AIS coding system categorises and code injuries by body region (anatomical location) and severity with a simplified numerical code from 1 to 6, where 1 represents a minor injury and 6 represents a maximal injury with an unsurvivable outcome.

B.8.6.6. The application of a consistent diagnostic criteria becomes important to identify claimants for whom it can be expected that the long-term multidimensional functional consequences of severe multiple injuries after trauma (polytrauma) would validate the use of a modifier to account for their expected worse outcomes in comparison to the single trauma claimant.

[44] Butcher N, Balogh ZJ. The definition of polytrauma: the need for international consensus. Injury. 2009 Nov;40 Suppl 4:S12-22. doi: 10.1016/j.injury.2009.10.032. PMID: 19895948.
[45] Milton M, Engelbrecht A, Geyser M. Predicting mortality in trauma patients - A retrospective comparison of the performance of six scoring systems applied to polytrauma patients from the emergency centre of a South African central hospital. Afr J Emerg Med. 2021 Dec;11(4):453-458. doi: 10.1016/j.afjem.2021.09.001. Epub 2021 Oct 28. PMID: 34765431; PMCID: PMC8567159.

`

B.8.6.7. Polytrauma impact on long term functional assessment

B.8.6.8. Trauma related injuries are a main cause for long-lasting morbidity and disability especially in younger patients with their productive years ahead. This statement does not seek to encroach on the benefit area that is defined and awarded for by LoE but to expand on how a modifier can be used to account for the long term worser outcomes for claimants with polytrauma.

B.8.7. Goal 7:

B.8.7.1. The final goal is to calculate a monetary value of the injury(ies) in line with the injury, its severity its impairment and adjusting for confounders or pre-existing medical injuries.

B.8.7.2. This should be a transparent and standardised formula for calculating monetary value of the injury.

B.8.7.3. This monetary value is based on:

B.8.7.4. In-depth research to provide international benchmark ranges (benchmarking research in progress)

B.8.7.5. Historical RAF award ranges (data research in progress)

B.8.7.6. These inputs will enable an actuarial based capped monetary value.

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B.9. Data Requirements for Solution Option 1

B.9.1. RAF will require the following sample data to verify certain assumptions relevant for Solution 1:

B.9.1.1. A mini sample of claims file data to test compliance of injuries classification seriousness to the intention of the serious injuries list currently used to determine the seriousness during the development and testing phases.

B.9.1.2. A sample of claims with diagnosis poly trauma to provide reference to historical methodology to compare to reference methodology for standardisation.

B.9.1.3. A sample of claims filed to provide ranges of monetary claims awarded to test the compiled reference monetary value data determined in research.

B.9.2. It has been determined that historical data for previous claimants can be retrieved from the RAF system. However, the extent of the detailed information needed will govern the resources, expenses, and efforts involved in its collection.

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Solution Option 2

B.10. Solution 2 Goals

B.10.1. Goal 1

B.10.1.1. Develop a standardised classification framework of injuries considered serious.

B.10.1.2. Ensure the framework is:

a. comprehensive to cater for all body systems, and

b. inclusive of all serious injuries within each body system that may result from motor vehicle accidents.

B.10.1.3. ICD 10 Classification is applied.

B.10.2. Goal 2

B.10.2.1. Re-establish an injury severity grading system based only in the AMA Guides.

B.10.2.2. Anchor the use of the AMA assessment as the only tool acceptable to determine rating of seriousness on injury using the Whole Person Impairment approach for each injury category.

B.10.3. Goal 3

B.10.3.1. Conduct in-depth research on methodologies for assigning monetary values to injuries by considering international best practices while aligning with the context of South Africa.

B.10.3.2. Comparison with previous RAF awards and judgement

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B.10.3.3. Research and document the historical awards in previous claims and identifying ranges of awards in prior claims processed.

B.10.3.4. Comparison with International Jurisdictions:

B.10.3.5. Research and document the presence or absence of social benefit schemes providing compensation for “General Damages” following motor vehicle accident injuries in international jurisdictions.

B.10.3.6. Provide insights into how the South African model differs from global best practices by analysing comparable provisions for monetary compensation in other countries such as the Americas, the European Union and the Asia Pacific and SADC regions as a reference determination.

B.10.3.7. Establish a maximum cap Determination in Accordance with Road Accident Act:

B.10.3.8. Review the provisions of the Road Accident Fund Act of South Africa to determine appropriate caps for compensation.

B.10.3.9. Research and document the provision of monetary caps in similar compensation schemes in other countries such as the Americas, the European Union and the Asia Pacific regions as a reference determination.

B.10.3.10. Ensure that the capped amounts align with the legal framework and provide fair compensation for victims.

B.10.4.Goal 4

B.10.4.1. Regulatory Review of Subjective Test Application

B.10.4.2. Review expectations of the regulatory framework and requirement for the subjective test

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B.10.4.3. Definition of outliers of WPI assessment due to disease complication or progression and the alternative consideration and objective assessment thereof

B.10.4.4. Expert Stakeholder Engagement

B.10.4.5. Engagement with relevant stakeholders to determine relevance of subjective assessment tools in injury assessment, classification and severity grading to ensure alignment with global standards and legal requirements.

B.11. Detailed Outline of Solution Option 2

B.11.1. Overview: The Online Road Accident Injuries Compensation System is envisaged as a digital platform designed to simplify and standardise the process of filing and managing claims for road accident injuries. In terms of the Act, the RAF must accept or reject the claimants RAF 4 serious injury assessment report within the stipulated time frame from the date on which injury occurred and the date on which the RAF 4 report was submitted and this shall remain as is.

B.11.2. This system aims to enhance predictability, accessibility, transparency, and efficiency, ensuring a fair and swift resolution for all parties involved.

B.11.3. Process Flow Optimisation:

B.11.3.1. Step 1: Claimant Facing

a. User registration and authentication

b. Inputs of personal data

B.11.3.2. Step 2: Clinician Facing

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a. Treating clinician[46] captures RAF 1

b. Treating / Assessing clinician captures RAF 4[47]

    i. This step generates WPI (manual or system driven)

B.11.3.3. Step 3: Medical Adjudicator Facing Verification

a. Adjudicator tests for congruence between RAF 1 and RAF 4 to ensure ICD10 in RAF 1 aligns with functional limitations listed in RAF 4

    i. If incongruent, the application is declined.

b. Verification of submitted data in RAF 4 by assessing clinician done by RAF Medical Adjudicator

    i. This step generates WPI (manual or system driven)

B.11.3.4. Step 4: Congruence Test

a. Confirmed WPI

b. There is alignment or non-alignment of confirmed WPI

    i. If there is non-alignment in final WPI then request for additional supporting information and refer claim back to Step 2 (ii)

    ii. If aligned, then progress to categorisation

[46] A treating clinician is a medical professional who provided treatment to the third party.
[47] RAF 4 can only be captured by an AMA trained clinician, this is referred to in this document as an Assessing Clinician who may or may not be the treating clinician.

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B.11.4. Key Features of the medical claims adjudication process:

B.11.4.1. User Registration and Authentication:

a. User Registration: Users should be able to register on the platform to initiate the claim.

b. Claimants will register the claim with ALL relevant documents including the medical assessment reports (i.e., the parent reports outlining injuries and their functional impact), clinical studies and related reports (e.g. MRI), and all expert reports (e.g. Psychiatrist's reports) as may be relevant to the claim.

c. The system will be used with simple medical language reduced of any medical jargon. This is because the intention is to enable claimants without medical background to be able to lodge a claim on their own.

B.11.4.2. Standardisation:

a. Standardised Forms:

i. Standardised online forms derived from the RAF 1 and RAF 4 for reporting accidents and injuries must form the basis for the system.

ii. This will ensure that essential information is consistently compiled.

iii. The online forms will contain validation fields to ensure that only valid information can be input by the claimant.

b. Uniform Assessment Guidelines

i. Established guidelines for medical assessments will continue to be applied.

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ii. The assessment guideline applicable will remain the AMA guidelines as defined in the Act to maintain standardised, empirical and evidence- based assessment.

B.11.4.3. Medical Claim Module:

a. Guided and structured online forms for claimants to submit details about the accident, injuries, rehabilitation and relevant supporting documentation.

b. Document Upload: Allow users to upload relevant documents, such as RAF 1, supporting medical reports, RAF 4

c. Confirm with claimant that the submission is at MMI[48]

d. System must compute that the claim is made within the RAF stipulated timelines based on the timelines of the accident and injuries.

e. Automated Evaluation: the system can automatically evaluate the submitted documents and selected inputs to determine eligibility for compensation.

f. Flags discrepancies or missing information for further submission - consider the option to save a file with missing information, for claimants to submit at a later date to complete the submission.

B.11.4.4. Medical Injury Classification System: Online Triage[49] System: The online categorisation system will have progressive options lists.

B.11.4.5. Revised Injuries list

[48] The *AMA Guides,* Sixth Edition defines MMI as the "point at which a condition has stabilised and is unlikely to change (improve or worsen) substantially in the next year, with or without treatment";
[49] Triage means to the sorting and allocation of claims according to a system of priorities in this case the classification into the proposed categories

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a. The revised serious injury list will be compiled as a starting point for the categorisation.

b. This categorisation will be based on the Revised Serious Injury Classification List (see Appendix A[50])

B.11.4.6. Medical Severity Assessment:

a. Injury Severity Assessment excludes any injury not meeting criteria for seriousness.

b. Excludes all non-serious injuries as per regulations[51] [in system back-end as invalid input or removed entirely from SI options list].

c. Includes all injuries meeting an impairment assessment of 30% of greater as defined in AMA guides.

d. All injuries in section 3.(1).(b).(iii) defined in the regulation as “An injury which does not result in 30 per cent or more Impairment of the Whole Person may only be assessed as serious if that injury”

B.11.4.7. Resulted in a serious long-term impairment or loss of a body function;

a. constitutes permanent serious disfigurement;

b. resulted in severe long-term mental or severe long-term behavioural disturbance or disorder; or

c. resulted in loss of a foetus.

[50] Revision of the List is in Progress.

[51] As defined by the Road Accident Fund Regulations, 2008 and The Road Accident Fund 2nd Amendment Regulations, 2012

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d. are defined as injuries that are included as they will derive an AMA assessment that is be definition above 30% WPI.

B.11.4.8. Injury Severity Criteria for Seriousness

a. The system will include an input of the assessed severity of injuries based on the information provided in RAF 4 by AMA trained medical practitioner52 or medical specialist

b. Identify ICD-10 codes corresponding to injuries that exceed the AMA guide threshold of 30% whole person impairment. Appendix A [mapping in progress]

c. Implement AMA Guidelines on the Evaluation of Permanent Impairment for assessing impairment[53.]

d. Accept injury as serious ONLY if the AMA threshold of 30% whole person impairment is equal to or exceeded

e. Exclusion Criteria from system injuries list:

f. Exclude injuries explicitly listed as non-serious in the Road Accident Regulations of 2012.

B.11.4.9. Categorisation of Injury:

a. Exclusion Criteria from further consideration of injury for award:

b. Exclude all sub 30% WPI injuries as reported by AMA trained medical practitioner[54] or medical specialist on RAF 4

[52] As defined in Road Accident Fund Act 56 of 1996 (as amended) and Road Accident Fund Regulations, 2008
[53] As defined in Road Accident Fund Act 56 of 1996 (as amended) and Road Accident Fund Regulations, 2008
[54] As defined in Road Accident Fund Act 56 of 1996 (as amended) and Road Accident Fund Regulations, 2008

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c. Categorise injuries into 3 grades

i. Grade 1 - 30 - 50% WPI

ii. Grade 2 - 51 -70% WPI

iii. Grade 3 - >70% WPI

B.11.4.10. Categorisation of award: Categorised Injuries awarded monetary award based on injury grade

a. Grade 1 Injuries – to be awarded at the average of the range 30 - 50% of the actuarially calculated monetary value of life for GDs

b. Grade 2 - to be awarded at the average of the range 51-70% of the actuarially calculated monetary value of life for GDs

c. Grade 3 - to be awarded at the average of the range >70% of the actuarially calculated monetary value of life for GDs

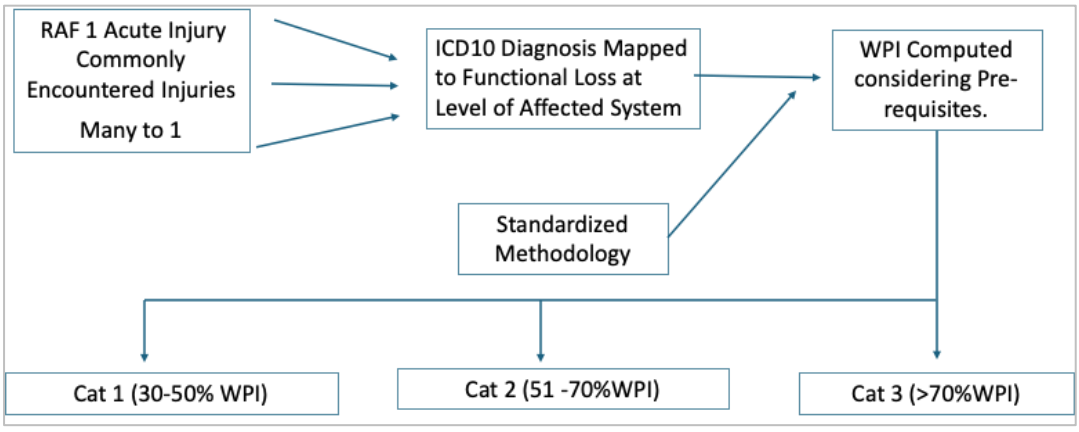

Figure 75: Proposed Classification and Seriousness Grading Flow Mapping

B.11.4.11. Tribunal Process: The appeal tribunal, appointed by the Registrar of the HPCSA to consider disputes will remain in place as is.

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B.12. Medical Rationale Under Solution Option 2

B.12.1. An initial analysis of the approach that may be used to classify required that a review of the process be mapped and a case be made for the proposed framework be applied.

B.12.2. Analysis of the Case for Proposed Classification and Grading Framework Overview:

B.12.2.1. The framework comprises:

B.12.2.2. Review and Replacement of Serious Injury List;

B.12.2.3. Injury Transition Consideration;

B.12.2.4. Confounders;

B.12.3. Review of Serious Injury List The starting point for the methodology is based on a review of the current RAF Serious Injuries (SI) list, these injuries are denoted as serious as contemplated by the RAF Act Section 17, read with regulation 3, “serious injuries that should be considered for general damages”.

B.12.4. The initial review finds that the SI list contains a list of injuries typical or prevalent in trauma cases at the acute phase of the trauma (most of the conditions are present and serious at the Acute Phase).

B.12.5. Our opinion of the Serious Injuries List after this initial review is that;

B.12.5.1. The SI list in its current form does not appear to meet the standard of seriousness as defined in the AMA Guides, the prescribed instrument, tested by the text or method of determining seriousness.

B.12.5.2. An injury is determined to be serious, if according to the AMA Guides, the WPI derived from the injury and its consequential functional limitations, is 30% or more.

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B.12.5.3. An acute diagnosis of an injury does not meet the criteria for classifying the injury as serious since such an injury is still undergoing treatment and has not reached Maximal Medical Improvement (MMI).

B.12.5.4. Upon testing the listed injuries at MMI, we find that some of the injuries listed do not always pass the 30% WPI threshold.

B.12.5.5. Furthermore, the SI list includes injuries that do not have a direct correlation with either loss of function and/or anatomical losses.

B.12.6. The current SI List will therefore be labelled in our proposed solution as the “Common Initial Clinical Presentation (CICP) list”.

B.12.7. This CICP list qualifies to be used for the acute description of the injuries and thus could suitably be used to populate the RAF 1 Form.

B.12.8. Injury Transitioning:

B.12.8.1. A process of transitioning the common initial clinical presentation list to functional limitations, where the limitations can either be physiological or anatomical, is thus acceptable or desirable.

B.12.8.2. This is to ensure that the conditions in the CICP list are mapped to functional limitations.

B.12.8.3. Further mapping will allow the clinical progression to be monitored for congruency, implying the following:

B.12.8.4. No minor common initial clinical presentation may progress to a severe form without the listing of diagnosed and codified complications;

B.12.8.5. Such complications can be monitored and documented under the RAF case management protocols to prevent gaming the scheme or listing of unrelated injuries as part of the RAF 4 process;

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B.12.8.6. The Fund may need to consider these cases that progress to determine the reason for further deterioration, which reasons may include:

a. Comorbidities,

b. Negligent treatment,

c. Other occupationally related aggravators.

B.12.8.7. Baseline injuries, with pre-existing conditions and other confounding factors as contained in 3.3, may thus be documented properly for apportionment.

B.12.8.8. Injuries that are minor, but complicate further, may need to be considered for possible consideration in order to determine final WPI when the treatment plan has reached finality and a maximal rehabilitation period have been afforded the claimant.

B.12.8.9. Consideration must be factored that major injuries may themselves heal completely to ultimately have little or no functional limitations.

B.12.8.10. Major injuries may remain as they are and be directly congruent with the functional limitations. [Insert flow chart of injury progression options from serious injury to 1) healed 2) constant or 3) complicated and non-serious injury to 1) healed 2) constant or 3) complicated]

B.12.9. **Confounders**[55]: Treatment of confounders will be considered at this stage as follows:

B.12.9.1. Age and its impact on the functional limitations as demonstrated by the examples below-

[55] Confounding may occur when the effects of a confounder are not controlled for or accounted for in the analysis. This can lead to a spurious association between the independent (injury) and dependent variables (functional limitation), making it appear as though there is a direct relationship when, in fact, the relationship is due to the confounder.

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a. A pre-ossified bone structure, may heal entirely by the time ossification occurs, leading to minimal functional limitations,

b. A gynaecological (urogenital) injury may have occurred in a postmenopausal woman with no childbearing potential, implying less functional limitations for such a claimant,

c. A male person of an age above 60 may also be a subject of minimal urogenital limitations.

B.12.9.2. Epilepsy and its impact on functional limitations,

a. Whilst the WPI derived from epilepsy as a solitary remnant of the injury may not reach 30% of WPI, the regulatory framework in the South African context precludes the claimant from gainful employment in certain sectors of the economy. The claimant who is of working age, may be deferred to the loss of likely earnings, however the pre-employable claimant may need to be considered under the general damages.

B.12.9.3. Regulatory restrictions and systems regulated elsewhere,

a. The SA Regulations on Hearing Impairment has a deviation from AMA Guides due to the 4KHz frequency being the distinguishing element of NIHL from traumatic hearing impairment. This is thus to be considered in the categorisation of the injuries.

B.12.10. Functional Limitations:

Functional limitations (based on the very premise of the AMA Guides) need to be documented in line with the prescripts of the AMA Guides, which dictate the proper documentation of the following:

a. Functional History

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b. Clinical Evaluation at the stage of MMI

c. Clinical Studies at the stage of MMI

B.12.11. Overall conclusions:

B.12.11.1. A WPI for the causally linked injuries, shall then be derived from this process.

B.12.11.2. Any other WPI, contributed to the overall WPI by confounders, shall be properly apportioned in line with the AMA Guides methodology, to derive a causally linked WPI which shall then be used for determining the general damages and categorisation to be followed.

B.12.11.3. All injuries are to be considered at MMI, the stage at which, by AMA Guides definition, further deterioration is unlikely in the next 12 months, or even if there is deterioration, such a change (improvement / worsening) shall not be more than 5% of the observed functional loss.

B.12.11.4. It must also be noted that due to the general pathophysiological mechanisms of motor vehicle accidents, most injuries do not occur in singular form, but are rather of a polytraumatic nature especially to adjacent organs and thus the possible combinations of these should be always elucidated.

B.12.11.5. Finally, no injuries, in their combined form, shall ever exceed the 100% WPI. Equally, no person with residual function (i.e., not dead), may be awarded 100% WPI.

B.12.11.6. In considering the categorisation of injuries, the description of the functional limitations, i.e., specific organ, organ system or bodily region, shall thus be used. The impairment so derived, shall be categorised in groups of 20% above the threshold, and each group considered per anatomical region in order to have the linkage and congruence with the Common Initial Clinical Presentation list mapped with the residual functional limitations at the time of maximal medical improvement (MMI).

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B.12.11.7. The determination of functional limitations is presupposed on certain capabilities being minimum standards required to be able to meet the entry criteria for the full assessment and alignment with the AMA Guides as the guiding document. For each system, a set of pre-requisites are to be defined and strictly adhered to in order to standardise the methodology.

B.12.11.8. Summary of Standardisation Framework

B.12.11.9. Prerequisites

Table 17: Assessment pre-requisites

Body System	Anatomical Region	Pre-Requisite	
		Functional Assessment	
		Clinical Examination	
		Clinical Investigations (tests)	

B.12.11.10. Assumptions: Some assumptions MUST be made as a mandatory standard.

B.12.11.11. Regulatory Provisions: All assumptions and recommendations are to be in line with current regulations.

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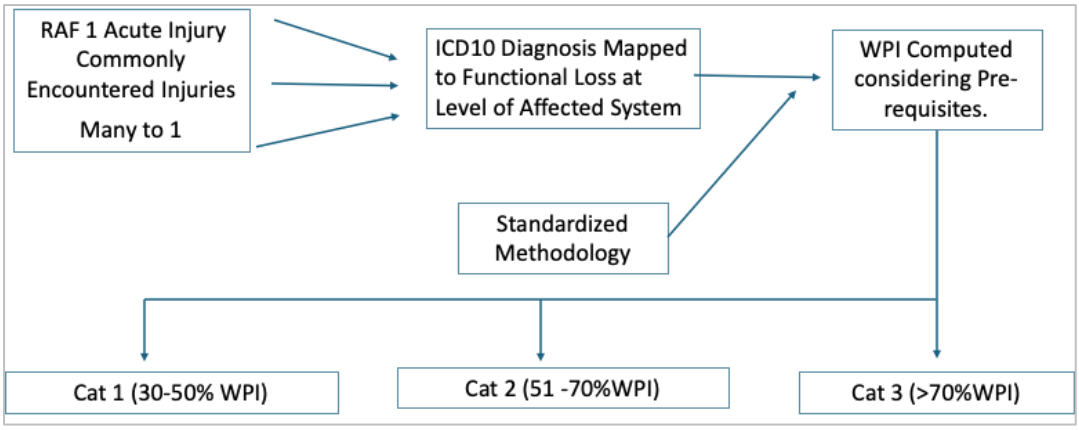

Figure 76: Proposed classification framework and Seriousness Grading

B.12.11.12. Categorisation Process

a. Categorisation can only be achieved for unitary injuries in their singular form. A condition may have ranges of impairment depending on the severity of functional limitations. The RAF must have a standardised tool to ensure proper range alignment. Polytrauma or injuries involving multiple regions are subject to combinations and a standardised tool must be used to determine this.

b. Cat 1 = All conditions, as defined in the AMA Guides, which conditions meet the minimum of 30% WPI up to and including 50% WPI.

c. Cat 2 = All conditions, as defined in the AMA Guides, which conditions meet the minimum of 51% WPI up to and including 70% WPI.

d. Cat 3 = All conditions, as defined in the AMA Guides, have a minimum 71% WPI up to the highest value possibly attainable.

e. The categories will carry a GDs Multiplication Factor (GDMF) which is proposed to be the mean of the range.

B.12.11.13. GDMF for each Category

a. Cat 1 = 40%

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b. Cat 2 = 60%

c. Cat 3 = 90%

B.12.11.14. Computed Value of Life for General Damages (CV-LGD)

a. X shall be the placeholder for the rigorously designed CV-LGD, and X shall have the value of 0 at death.

b. Payout, FOR THE FIRST INJURY, shall thus be, for each category.

i. Cat 1 = 40% *X

ii. Cat 2 = 60%*X

iii. Cat 3 = 90%*X

c. Payout for subsequent injuries shall follow an apportionment process as defined below.

d. Cat 3 shall only be eligible for a once in a lifetime GDs payout.

e. Cat 1 and Cat 2 shall have further apportionment and only if at a higher category, shall a further payout be made.

f. i.e.: A First Injury occurs, and claimant is compensated at Cat 1 level

g. Scenario 1: Second injury leads to WPI (combined for injury 1 and 2) is still in Category 1. There is no further payout.

h. Scenario 2: Second injury leads to WPI (combined for injury 1 and 2) is in Category 2. The payout is the difference between 20%*X (60%X – 40%X)

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i. For Cat 2 to Cat 3, the pay-out is the difference and amounts to 30%*X

j. The RAF shall maintain a database of all GDs payouts which should indicate at prompt of Primary Key Field, the history of payouts.

B.13. Data Requirement for Solution Option 2

B.13.1. The RAF will utilise a mini sample of claims file data to test compliance of injuries classification seriousness to the intention of the serious injuries list currently used to determine the seriousness during the development and testing phases.

B.13.2. The RAF will make use of a sample of claims filed to provide ranges of monetary claims awarded to test the compiled reference monetary value data determined in deliverable 3.

B.13.3. As noted before, WS4 has determined that historical data for previous claimants can be retrieved from the RAF system. However, the extent of the detailed information needed will govern the resources, expenses, and efforts involved in its collection.

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APPENDIX C: The Category Range of 10

C.1. The Category Range of 10

C.1.1. The Range of Class is the difference between Grade A and Grade E.

C.1.2. Of the 1887 computed descriptions according to class, there is 1220 of these whose range is 10 or less, whilst the 667 have the range being more than 10.

C.1.3. The reduction of complexity of the AMA Guides is suggested to be a jurisdictional determination that shall, instead of adjusting in line with the Net Adjustment Formula, take the average for the class.

C.1.4. Where the average for the class is adopted, the following breakdown exist.

Table 18: Category ranges

Category	Range	Total Descriptions
0	0 - 29	1214
1	30 - 40	92
2	41 - 50	102
3	51 - 60	62
4	>60	12

C.1.5. Some overlaps may be encountered but these are minor.

The list is an ongoing piece of reviewed data and may be adjusted accordingly before going live.

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