



Access to Rehabilitation Services for Road Traffic Injury Patients in Namibia

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Implications for Rehabilitation

- Road traffic injuries (RTIs) are a major global public health challenge with over 1.2 million people killed and a high burden of disability and Namibia is one of the worst affected countries globally.
- There is lack of knowledge on the availability to physical rehabilitation following road injury in Namibia
- Our study shows The Motor Vehicle Accident Fund (MVAf) model seems to enhance access to rehabilitation and is a model which could be replicated in Sub-Saharan Africa and other low and middle income countries.

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4 **Title Page**
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6 Title: Access to Rehabilitation Services for Road Traffic Injury Patients in Namibia
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3 **Abstract**
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7 Purpose: Road traffic injuries (RTIs) are a major public health issue worldwide. The importance of
8 physical rehabilitation following RTI is well documented. However globally there has been very little
9 research on the accessibility of rehabilitation services following road injury. Namibia is one of five
10 African countries with a fuel tax levy fund (MVAf), a system of case managers, medical care, and
11 case management system for coordination of long-term care.
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16 Materials and methods: We investigated the availability of physical rehabilitation services to RTI
17 injured in Namibia, through interviews with RTI patients and health care workers.
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21 Results: Unlike the few other studies done in Sub-Saharan Africa (SSA), most RTI injured individuals
22 in Namibia report they are able to access some rehabilitation following injury. In large measure, this
23 is due to the effective MVAf system which they felt ensures follow up care for many after having an
24 RTI. However, we found that access to rehabilitation is skewed in favour of those living in Windhoek
25 and other urban areas compared with those in non-urban areas.
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30 Conclusion: The MVAf model seems to enhance access to rehabilitation and is a model which could
31 be replicated in other SSA countries and other low and middle income countries.
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36 **Keywords:** Road Traffic Injuries (RTIs); Disability; Rehabilitation; Health care workers
37 (HCWs); Public health approach;
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1.0 Introduction

With over 1.2 million people killed and between 20 and 50 million injured annually, road traffic injuries (RTIs) have dramatically increased and are now a major public health issue worldwide [1]. RTIs are also identified as a leading cause of injury in most countries [2] with injuries often resulting in chronic pain, and long-term disability such as paraplegia, quadriplegia, loss of eyesight, and brain damage as well as stigma (due to disfigurement) [3]. Sub-Saharan Africa (SSA) is the worst affected region globally, with people sustaining injuries that leave them with permanent impairment and disability [4].

The importance of physical rehabilitation is well documented following road injury. Physical rehabilitation is extremely important for injured people as it utilises techniques and strategies focused on restoring function to the fullest level possible and helps the body achieve normal daily functions [5]. The World Health Report on Disability called on governments to organise, strengthen, and expand comprehensive rehabilitation services and programmes to improve quality of life of injury survivors worldwide and address the burden of disability from RTIs [6]. However globally there has been very little research on the accessibility of rehabilitation services following road injury with the little research done mostly confined to HICs, and the total costs for rehabilitation of the RTI injured being considerably underestimated [6]. Research in access to rehabilitation following an RTI is particularly lacking in SSA [7]. This is of particular concern because existing studies for high Income countries (HICs) clearly and strongly support the benefits of such interventions. Yet, even in HICs, limited access to rehabilitation post road-injury continues to be a missed opportunity to increase health and recovery. For example [8] reported that, in the United Kingdom (UK), although many participants recognised rehabilitation as very important to their recovery, many reported being unable to access this. Additionally, many who did receive rehabilitation in the form of physiotherapy felt they had not received enough sessions and the rehabilitation had finished too early [8] Similarly, [9] reported also in the UK that both injury survivors and service providers reported problems with

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3 accessing physiotherapy and limitations in the number of sessions due lack of funding. Similar
4 findings have also been reported in Australia [10] and the United States [11].
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8 From the little research done in SSA, it has been reported the lack of rehabilitation after road trauma
9 is a serious and rising problem [12, 13]. For example, one of the few studies done in SSA was
10 conducted in Ghana [7] and the results showed that the great majority of people admitted to the
11 trauma service following road injury received no rehabilitation services, and the few that did, received
12 inadequate services [7] SSA also has poorer rehabilitation systems and lower proportions of
13 rehabilitation staff compared with other global regions [6, 13]. Therefore there is generally a poorer
14 outcome for those involved in RTIs in SSA compared with other parts of the world: they have less
15 access to rehabilitation, limiting them reaching their best possible functional outcome following a
16 road injury.
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28 Our research focused on this topic in Namibia, an SSA country having one of the highest global RTI
29 injury and death rates [1]. Namibia is also of specific interest because it is one of five countries in
30 SSA (the others are South Africa, Swaziland, Botswana and Lesotho) which have a system in which a
31 fuel tax levy fund – the Motor Vehicle Accident Fund (MVAF). This was set up in Namibia to
32 provide support for RTI survivors in terms of funding for all medical costs, aids and appliances
33 required rehabilitation, and in the event of severe injury, a lump sum payment, and a caregiver
34 allowance for those injured in RTI. The scheme is based on a surcharge at the pump on every gallon
35 of gas purchased [12]. Tables 1 and 2 show the registration process and benefits available under the
36 MVAF scheme. This paper, part of a broader study of the MVAF [12], provides a more nuanced
37 understanding of the accessibility of rehabilitation services through the MVAF to people injured in
38 RTIs in Namibia. In particular, in this paper, we examine the current MVAF rehabilitation services
39 and identify where there may be limitations for individuals in accessing rehabilitation and the specific
40 hindrances.
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2.0 *Methods*

2.1 *Data collection*

In this study we conducted two sets of interviews. The first set involved interviews with healthcare workers (HCWs) and disability advocates in Namibia, while the second set involved interviews with Namibian RTI victims. The two sets of interviews were conducted using semi-structured questionnaires. These included both closed questions to elicit information such as “Did you receive any rehabilitation?” with “yes” or “no” responses, and open-ended questions, where more detailed responses were elicited. An example is the question asked of HCWs, which was based on our observations: “Could you tell me more about the proportions of road-injury survivors needing rehabilitation who do receive this in Namibia?” Arrangements were made to use translators for interviewees who preferred to be interviewed in Afrikaans or Oshiwambo, the most widely spoken native languages, however all the interviewees preferred to be interviewed in Namibia’s official language, English. (A copy of the full Survey tool is available from the UCL depository).

2.2 *Study site and setting*

14 interviews were completed with RTI injured survivors whilst 20 interviews were completed with HCWs. Of these, 18 of these interviews carried out in the capital city, Windhoek, and 16 conducted in other parts of the country, including Walvis Bay, Rehoboth, and Swakopmund. The research was conducted over a five week period and the recruitment processes are described below. Figure 1 is a map of Namibia showing the different regions and cities.

Figure 1.1: Map of Namibia

2.3 *Sampling methods used*

The use of purposive sampling was required due to the exploratory nature of this study and access to the population under study. Road injury victims were accessed via establishing contacts with two organisations, the Namibian Association of People with Physical Disabilities (NAPPD) and the National Federation of People with Disabilities in Namibia (NFPDN) which are two organisations representing the interests of, and advocating for, people with physical disabilities in Namibia. Both of

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3 these organisations were receptive to the need for this study and initially identified four possible
4 participants. Of the four individuals approached, three agreed to participate whilst one declined.
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6 Eleven additional participants were recruited via snowballing. In sum, the sample was made up of 14
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8 individuals with long-term road traffic injury-related disabilities. Nine of the 11 individuals recruited
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10 through snowball sampling aligned neither to the NAPPD nor to the NFPDN.
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16 The first author (MC) began recruitment of HCWs through an internet search of specific service units
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18 which focused on identifying HCWs involved in the care of RTI victims or those who had
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20 insight/influence on this process. Eight HCWs were initially approached directly through an
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22 introductory e-mail followed by a phone call and invited to participate in the study. A further 12
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24 individuals suitable for the study were recruited via snowball sampling from the initial eight; the
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26 sample had a total of 20 participants.
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32 **2.4 Interview procedures and Analysis**

33 No monetary benefits or gifts were given and participation in the study was entirely voluntary. All
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35 interviews were conducted by the first author (MC) and performed individually at a time and place
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37 most convenient for the participants. All interviews were recorded and lasted 40 minutes on average.
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39 Interviews continued until data saturation was achieved (14 for the interviews with RTI survivors and
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41 20 for HCWs).
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44 In terms of the demographic characteristics of HCWs, 55% (n=11) were male, and 45% (n=9) were
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46 female, with an average of 9.6 years work experience each. The HCWs interviewed included
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48 rehabilitation, nursing and medical professionals, working in both the public and private sectors, in
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50 different regions of the country. With regards to the injury victims, 57% (n=8), were male, 43%
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52 (n=6) were female; 79% were aged below 40, with the average age of 34.6 years.
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56 Semi-structured, open-ended questionnaires were developed for both HCWs and injury victims. These
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58 were based on existing RTI questions and adapted for factors pertinent to access to physical
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60 rehabilitation in Namibia. Some of these factors included type of injury, emergency and hospital care,

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3 rehabilitation and costs associated with health care following the injury. The questionnaires also
4 collected demographic and socio-economic information such as level of education, age, and gender
5 for both injury victims and HCWs. Income is a sensitive subject in Namibia, thus we focused on level
6 of education for socio-economic standing.
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11 12 **2.5 Analysis**

13 Analysis started with careful review of tapes leading to full transcription of audio recordings. All
14 transcriptions were done within seven days of the original interview by the lead author (MC).
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19 In line with the six-step framework of [14], data from both sets of interviews were analysed using
20 thematic analysis. This framework is reportedly the most widely used approach in thematic analysis
21 because it gives a clear and usable framework for conducting analysis [15]. One important advantage
22 of thematic analysis is that it not only allows for data interpretation, but is also beneficial for
23 producing analyses suited for informing policy development [14]. We coded the data manually
24 because of the relatively small sample size. In line with an inductive approach, codes formulated were
25 data-driven, with no pre-defined themes to guide the coding process.
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35 **2.6 Ethical considerations**

36 We obtained ethical approval from both the Ministry of Health and Social Services in Namibia (No.
37 17/3/3) and the UCL Ethics Committee (No: 7417/001). Participation in the study was entirely
38 voluntary with no incentives given. Participants were given information sheets, with explanations
39 provided with regards to confidentiality being maintained throughout the study. Following this,
40 participants were requested to sign a consent form to ensure they understood the information given
41 and also to provide an opportunity for them to ask questions. The form also made sure participants
42 were aware of their right to withdraw at any time. There was a plan in place that if any road injury
43 victims became distressed during interviews, or seemed in need of further support or information,
44 they would be referred to local disabled people's organisations (DPOs) which were contacted prior to
45 the interview process. However, this was not required as none of the participants needed such support.
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3.0 Findings

3.1 Availability of rehabilitation- road injury survivors

Findings from our interviews showed that the current system for RTI support under the MVAFA provides medical care at the time of injury. As noted in section 1.0, rehabilitation is also crucial to restore those with injuries to their best functional levels and there is provision in the MVAFA to provide such care. Although most road injury survivors reported that following the injury they had received rehabilitation, they also felt that the longer-term rehabilitation system does not function as smoothly as the medical care in the immediate aftermath of the injury. For example, several of those interviewed indicated that although they had received trauma care, they had not received any rehabilitation, despite the need for this following the road injury. For example, one of the participants reported having sustained a lower limb fracture and being given crutches but had not been able to get an appointment to see a physiotherapist to teach her how to use them and consequently had used them incorrectly, which complicated her injury as she was incorrectly putting excessive weight on the fractured limb.

Some participants reported they felt the rehabilitation they had received was neither sufficient nor comprehensive. One participant (L4), a young man who had a complete (cervical) spinal cord injury and was paralysed in all four limbs, had been an in-patient in a spinal rehabilitation unit. He expressed dissatisfaction because he had not been taught about bowel evacuation and reported that once discharged from the unit he needed to figure this out on his own.

The most significant finding, however, was that services seem to be available primarily in Windhoek but limited elsewhere. This was noted by a number of the injury survivors, who consistently highlighted a difference between access to rehabilitation in Windhoek compared with the rest of the country, especially the rural areas. An example was provided by one quadriplegic participant who reported that after treatment and rehabilitation in the capital Windhoek he was discharged to his home town in the region where he was to have follow-up treatment with an occupational therapist (OT). The regional OT did not know how to assist him and carry out further management. In order to be sent

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3 back to see the OT in Windhoek, he had needed to contact the MVAf. Gender and age did not seem
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5 to have any influence on the responses given by participants. However, the majority of those reporting
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7 living outside Windhoek (and consequently reporting reduced access to rehabilitation services due to
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9 location) had lower levels of education compared to those in Windhoek, which is the most expensive
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11 location in Namibia.
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16 Lack of comparable or available care had led some of the participants to move to Windhoek from
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18 their homes in rural areas after the injury specifically in order to access better healthcare services. For
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20 example, L14, a young woman paralysed in her lower limbs highlighted this when she said:
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24 **I was staying in Rosh Pinah, it's a small town in the south of Namibia. There is only one**
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26 **hospital. The treatment wasn't up standards as to Windhoek's. So, that's why I had to move to**
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28 **Windhoek.**
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33 Another participant however reported having actually moved from Windhoek to the rural area where
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35 her mother lived in order to have family support, thus having to decide between better rehabilitation
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37 services or family support. She highlighted she was unable to have any follow-up rehabilitation
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39 treatment following the move.
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42 **No, I did not get any rehabilitation or anything because I had to move from Windhoek to the**
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44 **rural areas. My mother was in the rural areas and there, there are no rehabilitation facilities.**

45 *[L5, 32 year old female]*
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48 **3.2 Availability of rehabilitation - HCWs**

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52 All HCWs reported that a greater proportion of road injury survivors in Namibia were able to access
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54 rehabilitation treatment due to the involvement of the MVAf. Specifically they pointed out that
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56 access to rehabilitation for road injury survivors had greatly improved from the previous years. This
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58 was due both to the decentralisation of the organisation from the previous one central office in
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3 Windhoek to the seven regional offices, which began in 2008, and to the introduction of MVAF case
4 managers. They felt this had made the MVAF more accessible to people in rural and regional areas.
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9 Despite these well-intentioned efforts to decentralize care, however, HCWs felt that equitable access
10 to treatment nationwide still needed significant improvement. Most HCWs reported that a
11 considerable proportion of injury survivors, despite the involvement of the MVAF and the
12 improvements noted, were not able to access rehabilitation services and treatment. The major reason
13 given for this was a lack of personnel, resulting in a general lack of access to rehabilitation in
14 Namibia. Several of them noted that rehabilitation services in both the private and public sectors were
15 already overwhelmed because of low staffing levels and long waiting lists. Thus, despite funds being
16 available from the MVAF, road injury survivors needed to wait to be seen, which compromised their
17 recovery to optimal functional levels.
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30 One physiotherapist attributed this to the lack of training opportunities. He highlighted that at the time
31 of interview there were no universities offering courses to train physiotherapists, occupational
32 therapists, speech therapists, and orthotists/prosthetists, with all staff in this line of work having trained
33 mostly in South Africa, other neighbouring countries, or overseas.
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41 HCWs interviewed went on to explain that most of the rehabilitation services, including those in the
42 public system were concentrated in urban areas, especially in Windhoek. For example, P18, a
43 Rehabilitation quality specialist at MVAF, reported:
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49 **Yeah, I think the biggest challenge is that rehabilitation services are concentrated in the urban**
50 **areas. Not just the urban areas, but the main major urban areas. That's where you find most of**
51 **the physios, OTs, speech therapists. So if a person is coming from a rural place, for them to**
52 **access these services, they need to travel to those particular centres where they can get such**
53 **services.**
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3 Adding to this, P13, an orthoptist in Windhoek, reported that community outreach was the only other
4 way those in non-urban areas could access rehabilitation services. However several HCWs criticised
5 community outreach in Namibia as having been generally irregular and erratic. In addition, P13
6 reported his team had identified that some of the people needing to access their services in remote
7 areas had no knowledge of the outreach programs and outreach dates, whilst for others, travelling
8 distances had been a barrier.
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18 Meanwhile, several of the HCWs also highlighted that even when services were available in regional
19 centres and rural areas, there was a lack of specialised rehabilitation staff in those areas compared to
20 the urban areas. For example P5, an occupational therapist in the Spinalis unit in Windhoek, reported
21 that some of their road injury patients who had been discharged to the care of regional hospitals had
22 developed potentially life threatening complications.
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28 **What we see in the northern regions is that, obviously there is a physio and an OT, but they are**
29 **not trained specifically with spinal cord injuries. So, the patients get secondary complications**
30 **and can die from them.**
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37 A senior occupational therapist in Windhoek, (P6) noted that most of the staff who worked outside
38 the main cities lacked clinical experience and had less opportunities to pursue continuing professional
39 development courses compared with those in Windhoek;
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45 **Here, you've got a higher chance of being sent to courses for CPD activities. There is not much**
46 **happening out there. So the quality that you get at a regional hospital is different from the**
47 **quality of service at a tertiary hospital.**
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53 HCWs explained that although there were national groups for physiotherapists and OTs such as the
54 Namibian Society of Physiotherapy which organised continuing development courses, the majority of
55 the courses were done in Windhoek, the capital city. They explained the courses had to be paid for by
56 the individual and the additional expenses of travelling and staying in Windhoek were deterrents for
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3 practitioners based outside the city. Adding to this, other HCWs reported that OTs and
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5 physiotherapists in the regional centres had less time to do any clinical work as they also have a lot of
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7 administrative duties. They noted that as a result, their rural colleagues were not as clinically exposed
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9 and could only offer patients, including road injury survivors, limited treatment sessions. They added
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11 that frustration at the short treatment times, added to the often long distances of travel to reach
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13 rehabilitation services, had resulted in some road injury survivors not coming back for follow-up
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15 treatment.
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20 Meanwhile, P6, a senior occupational therapist in Oshana, noted that due to the extensive
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22 administration responsibilities required by the rehabilitation professionals in the districts and rural
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24 areas, auxiliary staff lacking any qualifications titled medical '*rehabilitation workers*' would often
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26 conduct the actual treatments of patients. P6 felt they were not adequately trained to manage the
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28 treatment sessions of the injured and required extensive training.
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33 Also discussing the quality of rehabilitation services outside the major centres and in rural areas,
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35 several HCWs raised the point that due to the low staffing numbers of rehabilitation personnel and
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37 poor community rehabilitation services in rural areas, family members were being trained to continue
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39 with the rehabilitation of road injury survivors following discharge from hospital to their home areas.
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41 They highlighted that because care givers were not suitably trained, road injury survivors generally
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43 had poorer outcomes and developed more complications in these areas compared to those in
44
45 Windhoek and other major centres whose continuation of care was managed by professionals.
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50 For all these reasons, HCWs felt that road injury survivors living outside Windhoek, especially in
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52 rural and district areas, were disadvantaged in terms of access to rehabilitation services and treatment.
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54 They also explained the high levels of inequality in Namibia and associated living in rural areas with
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56 greater levels of poverty compared to urban dwellers. They reported that in the long-term they had
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58 poorer outcomes as they were less likely to reach their full physical potential and more likely to have
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60 residual disabilities following rehabilitation which would worsen the cycle of poverty. In fact, some

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3 of the HCWs interviewed noted that some road injury survivors who had relatives living in Windhoek
4 had moved there in order to access better rehabilitation services and to enhance their chances of
5 reaching pre-injury physical potential. This also echoed the reports of some of the road injury
6 survivors, noted earlier in this paper, who decided to move Windhoek because the services in their
7 local areas were not as comprehensive.
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15 The MVAf was also criticised for limiting the number of rehabilitation sessions available to those
16 with injuries. P17 reported the referral of injured survivors by the MVAf to rehabilitation services
17 had become more complex, requiring a doctor to prescribe these services and authorisation. P17
18 reported difficulties with this process because of a general lack of knowledge on rehabilitation
19 services. **Sometimes, the MVAf case managers will just say that there is no need for therapy
20 even if the doctor wrote the referral letter. And sometimes they give you the authorisation and
21 they say the patient can have five sessions. Then you think, for severe head injuries, you can't
22 do five sessions and say that's it! So, in the end the patient is the one who will suffer.**
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36 **4.0 Discussion**

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39 The results in our study indicate that most survivors reported they had been able to access physical
40 rehabilitation following injury due to the strengths of the MVAf. HCWs also reported that most road
41 injury survivors were able to access rehabilitation. Both groups identified the involvement of the
42 MVAf as instrumental to this because they were paying for the rehabilitation costs following injury.
43 HCWs reported that the MVAf was also arranging for rehabilitation services to be accessed in private
44 clinics, where services were deemed to be better and the injured could be seen more quickly, without
45 any long waiting lists. In comparison, HCWs reported that access to rehabilitation services for non-
46 RTI related injuries for the Namibian population requiring this was very low because of the absence
47 of a scheme like MVAf meaning they have to pay the costs individually. Additionally, considering
48 that only 15% of the population have medical insurance [16], HCWs reported that the costs of paying
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3 for treatment outside the MVAf system can be a barrier to accessing care such that they end up not
4 being to access services like rehabilitation, which are essential in regaining their full potential.
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9 As noted in section 1.0, very little research on the accessibility of rehabilitation services following
10 road injury has been done globally. On the African continent, one of the few comparable studies on
11 rehabilitation following RTIs is from Ghana [7]. Their results showed that the great majority of
12 people admitted to the trauma service following road injury in Ghana did not receive any
13 rehabilitation services, and the few that did received inadequate services [7]. Comparing the findings
14 in our study, which show that most of road injury survivors were able to access rehabilitation services,
15 despite the low general levels of access to rehabilitation in Namibia, indicates the MVAf has been
16 more successful in helping to facilitate rehabilitation services for injury survivors in Namibia than in
17 Ghana, where private motor vehicle third-party liability (MTPL) insurance is in place. This makes for
18 a strong argument for other countries in SSA that only have MTPL to adopt a system such as the
19 MVAf, as it clearly seems to have augmented access to rehabilitation services for road injury
20 survivors.
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37 Such motor vehicle fund tax schemes are rare but not unique. The Australian state of Victoria has a
38 scheme similar to MVAf called Transport Accident Commission (TAC). [17] reported that TAC was
39 viewed favourably, with many road injury survivors reporting their treatment costs were being
40 covered by TAC, and minimal out-of-pocket payments. This matches with the findings from our study
41 about how this type of system enhanced access to services following road injury. Another important
42 advantage with regards to the MVAf is the use of rehabilitation case managers, whose activities were
43 reported positively by both HCWs and injury survivors. Similar to MVAf, TAC was viewed
44 positively by road injury survivors because of a single point of contact with TAC, called early support
45 coordinators (whose activities are similar to MVAf case managers) [17, 18]. In a study of needs of
46 injury survivors following discharge from hospital, [19] reported that problems with care-coordination
47 and follow-up could be improved by the use of case managers to improve care pathways. Additionally
48 a case manager dedicated to supporting injury survivors could reduce the complexity of health system
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3 for the injured survivors by acting as a single point of contact, providing consistent and up to date
4 information, and coordinating service provision [20]. Care coordination by case managers can also
5 promote timely access and engagement with appropriate services based on individual needs, improve
6 quality of care and the flow of information between service providers, as well as enable cost savings
7 [18]. Additionally, case managers can promote independence and autonomy for those with severe
8 injuries [20]. Significantly, [18] found that when no key person coordinated care, people with severe
9 RTIs and their families reported restricted options for service access, follow-up, quality and
10 collaboration. “In the absence of an accountable key coordinator, long-term planning, information
11 sharing, and the alignment of needs with resources, did not consistently transpire” [18: pg 579].
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24 Another important finding from both sets of interviews was that although most road injury survivors
25 were able to access them to a certain extent, rehabilitation services were generally lacking in Namibia
26 and were also greatly skewed, with most services located in Windhoek and other regional urban
27 areas, and almost absent in peri-urban and rural areas. HCWs reported that despite the involvement of
28 the MVAFA, including how they were paying for all the treatment/rehabilitation costs, a considerable
29 proportion of road injury survivors were not able to access rehabilitation services.
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39 Several reasons were given by HCWs and the injured who were interviewed. The main reason given
40 for this was that they lived too far away from these services and accessing transport to travel the long
41 distances services (especially for those with lower limb problems) was difficult, with transport costs
42 being also being a limiting factor. The accounts given by HCWs matched those of the injury survivors
43 who had lived outside Windhoek. They reported that services were concentrated in Windhoek and
44 lacking in other regions or too far away to travel to - such that some of them had needed to move to
45 Windhoek from their homes in order to access rehabilitation and other health services.
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55 HCWs also revealed that there was also a severe shortage of rehabilitation staff generally in Namibia,
56 which was compounded by the fact that Namibia did not have any training facilities for rehabilitation
57 personnel. This scenario has changed recently, with the University of Namibia offering the first
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3 Physiotherapy and Occupational Therapy undergraduate places in the 2018 academic year [21, 22].

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5 However, despite the advancement, places for the programmes were reported to be very limited at 15
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7 per year and at least 10% of places being reserved for international students to allow the university to
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9 benchmark [21].
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13 HCWs also reported that the staff in Windhoek were more specialised and likely to have more
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15 experience with RTIs. This matched some of the reports of injury survivors, who indicated the service
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17 they had received once discharged to the regional towns had not been as good and they had needed to
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19 go back to Windhoek to receive additional treatment. HCWs also revealed that rehabilitation staff
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21 outside Windhoek also had a lot of administrative duties and less time for clinical work such that they
22
23 could only offer patients with road injuries, and others, limited treatment sessions. The main point
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25 HCWs were making, as they explained these regional disparities, was that road injury survivors living
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27 in the rural areas were likely to have poorer outcomes as their access to rehabilitation services was
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29 more limited, due to these various factors, and was also more likely to be of lesser quality. Their
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31 reflections also underscore the missed opportunity to provide solid, on-going, funded, professional
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33 training either in person or remotely to colleagues in rural areas.
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39 The findings in our study match findings of other researchers in Namibia. Qualitative work by [5]
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41 found that accessing rehabilitation and other health care facilities in rural areas was a major problem
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43 for people living with disabilities. They reported that regardless of type of disability, people living
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45 with disabilities complained of lack of rehabilitation in almost all of the rural clinics [5]. Similarly, in
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47 the study by [23], participants noted that rehabilitation services for people living with disabilities were
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49 concentrated mainly in Windhoek, and those in other regions and in rural areas did not have the same
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51 opportunities for treatment and rehabilitation. Adding to this, [23] and [24] reported that skewness of
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53 rehabilitation services is partly because of severe shortages of staff such as physiotherapists and
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55 orthotists, which also matches our findings. Similarly, [5] concluded that transportation was one of the
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57 biggest problems people living with disabilities face in accessing rehabilitation and other health
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59 services, especially for those with lower limb, spinal and neurological disability. In their study, most
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3 rural healthcare facilities were found not to have transport facilities and did not arrange transport
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5 unless somebody was very sick, which could take long periods [5]. The researchers also reported that
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7 the costs of transportation for people living with disabilities can be prohibitively high [5]. Other
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9 studies in SSA have shown similar findings. In Malawi, [25] also found that the cost of transportation
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11 was exorbitant with participants interviewed recalling long, painful trips walking to the hospital as the
12
13 only option because of financial problems and sometimes leading to delayed care. Similarly, in Sierra
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15 Leone, the findings of [26] showed that patients could not afford transport to rehabilitation centres.
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17 Similar findings have even been also noted in HICs. In a study of the experiences of injured patients
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19 in Victoria, Australia, [10] found that participants reported opting not to attend rehabilitation because
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21 of the distance family members had to travel to visit them in inpatient rehabilitation facilities when
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23 outpatient rehabilitation was not available.
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28 Considering that the majority of people in Namibia live in rural areas [27], the enhancement of
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30 services outside the main cities will be of benefit not only to road injury survivors, but also to many
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32 other people living with disabilities, older adults and the rest of the population. A big step towards this
33
34 would be for the government to train more rehabilitation professionals. Another solution would be the
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36 training of adjunct multipurpose rehabilitation workers with basic training in a range of disciplines
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38 (occupational therapy, physical therapy, speech therapy, for example), or as profession-specific
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40 assistants that provide rehabilitation services under supervision.
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45 This has been done successfully in several LMICs: countries such as India, Lebanon, Myanmar,
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47 Thailand, Viet Nam, and Zimbabwe, have all responded to the lack of professional resources by
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49 establishing mid-level training programmes [28]. The advantage of mid-level training is that it is less
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51 expensive, and although it may be insufficient by itself, it may be an option for extending services in
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53 the absence of full professional training [29]. The shortage of rehabilitation personnel in Namibia has
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55 also been attributed to brain drain but a positive side-effect of mid-level training is that trained
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57 professionals are limited in their ability to emigrate to HICs [29]. These workers could also fill the
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59 gap for professionals not wanting to work outside urban areas.
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5 Another solution could be the use of modern technology. In Namibia, most people now own mobile
6 phones. According to [30], the use of information and communication technologies (ICT) for
7 rehabilitation is an emerging resource that can enhance the capacity and accessibility of rehabilitation
8 measures by providing interventions remotely. The advantage and need for ICT is even more apparent
9 this year (2020) due to the COVID19 outbreak and may be the way forward in future as the world
10 becomes even more globalised. Tele-rehabilitation technologies include video and teleconferencing
11 technologies in accessible formats, mobile phones, and remote data-collection equipment and tele-
12 monitoring [6]. Technology may be used by people with disabilities, rehabilitation workers, peers,
13 trainers, supervisors, and community workers and families. Tele-rehabilitation techniques have
14 successfully enabled people in remote areas to receive expert treatment from specialists located
15 elsewhere in vast areas including cardiac rehabilitation [31], speech and language therapy [32], and
16 cognitive rehabilitation for people with traumatic brain injury [33] as well as training and support of
17 health-care personnel computerized guidelines to help clinicians use appropriate interventions [6].
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34 **5.0 Limitations**

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37 Although we conducted the interviews until data saturation and such a sample size is not unusual for a
38 qualitative study, one limitation to this study is the relatively small sample size. Thus, although the
39 experiences shared by participants in this study were an important source of information and
40 evidence, their experiences cannot be generalised to Namibia's whole population of those injured in
41 RTIs and the HCWs involved in their care.
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6.0 Conclusion

The overall consensus of road injury victims and HCWs who provide that care, was that due to the MVAFA, most of those injured in RTIs in Namibia have some level of access to physical rehabilitation following injury. The MVAFA system has been shown to be effective in terms of making physical rehabilitation treatment accessible for road injury victims despite financial status, thus increasing their likelihood of returning to normal life or enhancing their quality of life post-accident. However access to services has also been shown to be skewed, with most services and rehabilitation professionals being concentrated in Windhoek and other urban centres and almost deficient in rural areas such that injury victims in those areas have long distances to travel to access the services. Consequently, they have less access to rehabilitation and are more likely to have long-term complications and not reach full physical potential. Thus they are more likely to be deprived of the essential rehabilitation which is key to optimal recovery. This requires attention from the Namibian government to improve services across all areas of the country.

Words: 6,124

List of Abbreviations

DPO: Disable People's Organisation

HCWs: Health Care Workers

HICs: High Income Countries

LMICs: Lower and Middle Income Countries

MVAF: Motor Vehicle Accident Fund of Namibia

MTPL: Motor Vehicle Third-party Liability Insurance

NAPPD: Namibian Association of People with Physical Disabilities

NFPDN: National Federation of People with Disabilities in Namibia

RTI: Road Traffic Injury

SSA: Sub-Saharan Africa

WHO: World Health Organisation

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3 **Declarations**
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9

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13 the field trip in Namibia.
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20 **Declaration of interest**
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22 The authors report no conflicts of interest.
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28 **Data availability statement**
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30 The datasets generated and/or analysed during the current study are available in the
31 (Chatukuta: 2019, UCL depository): <https://discovery.ucl.ac.uk/id/eprint/10088775/>
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Table 1: MVAF registration process

- According to the legislation, in the event of a road crash, ideally, the MVAF call centre has to be notified, following which they will dispatch an ambulance.
- Crash survivors are triaged at the scene of crash and individuals with moderate or serious injuries are admitted to either state or private healthcare facilities, with those with minor injuries treated and discharged.
- The injured person is issued with an MVAF reference number, and an MVAF case manager undertakes hospital visits and issues a claim form for submission by the injured individual.
- Once the injured person submits the claim form, the MVAF assesses the claim based on the individual's injuries and processes payment of an injury grant if this has been deemed applicable.
- When complete information has been provided, claims are supposed to be processed within 30 days.
- Again, according to MVAF rules, following an injury should follow up rehabilitation or additional care be needed a case manager is assigned the case, and he/she drafts and implements rehabilitation plans in consultation with the injured individual.
- The case manager obtains progress reports from specialists/doctors managing the individual to assess whether they need further rehabilitation.
- Based on this assessment, the claim is either closed or further rehabilitation is provided.

Source MVAF (2018)

Table 2: Benefits provided by the MVA

Benefit type	
Medical Benefits	An individual injured in a road crash is eligible for up to N\$1,500,000 (US\$ 98,464) which provides for medical treatment, injury management, and rehabilitation.
Injury Grant	The Fund provides an injury grant to the value of up to N\$100 000 (US\$ 6.564). This is a cash grant that serves as compensation for injury for any injured person, with certain limitations and exclusions.
Funeral Grant	The Fund provides a funeral benefit to the value of N\$7 000 (US\$ 460) for any person who dies in a road crash in Namibia.
Loss of Income	Loss of income may be claimed by a survivor of a road crash up to N\$ 100 000 (US\$ 6.564) with certain limitations and exclusions.
Loss of Support	Loss of support may be claimed by a dependent of a deceased up to N\$ 100 000 (US\$ 6.564) with certain limitations and exclusions.

Source (MVA, 2018)

The amount allocated to each individual is based on the severity of injury. For those who have been deemed after assessment to have serious injuries such as paraplegia or quadriplegia, home modifications are also made if they or their parents own the property. They are also provided with a monthly caregiver allowance.

Figure legend

Figure 1.1: Map of Namibia

For Peer Review

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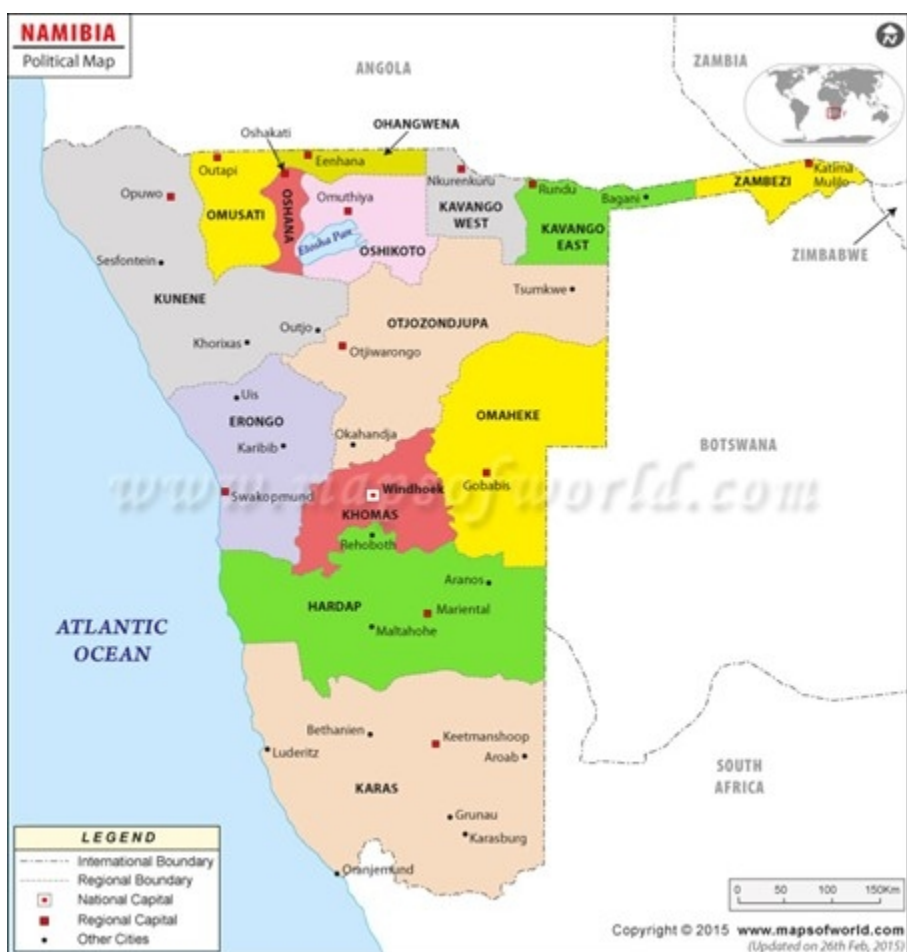


Figure 1.1: Map of Namibia

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