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School of Public Health

Evaluation of the Grassroots Soccer Club HIV/AIDS programme in Musina, South Africa

Research Report in Partial Fulfilment of the Requirements of the degree of

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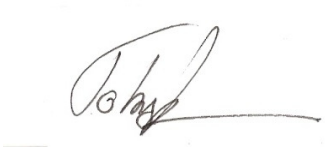
Declaration

I Tobias Luppe declare that this research report is my own work. It is being submitted for the degree of Master of Public Health at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at this or any other University.



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Abstract

Background and Study Question: Adolescents are a high-risk group for HIV/AIDS infection and illness in South Africa. Despite substantial prevention efforts, high risk behaviour among adolescents continues. Several organisations have engaged in sports activities to reach out to adolescents and educate them in life-skills and HIV prevention. There is, however, very little published research on the effectiveness of such interventions. Grassroots Soccer (GRS) is one of the emerging organisations in the field of using sports for HIV prevention. Financed by De Beers' corporate social responsibility initiative it operates in several South African mining communities. This study evaluates the HIV prevention programme in Musina, Limpopo Province run by GRS. The research focuses on the processes and the outcomes of the organisation's activities to determine barriers and facilitators to implementation of the GRS activities and to measure changes in HIV-related knowledge, self efficacy, and attitude of the beneficiaries.

Methods: A mixed-methods study design was used incorporating qualitative and quantitative approaches. The qualitative component of the study was based on key informant interviews and a document review. Qualitative interviews were analysed using a four-step systematic approach; documents were analysed by iterative reading. Quantitative data was collected by GRS through self-administered pre- and post-intervention questionnaires. Secondary data analysis was carried out using statistical software SPSS (Version 17.0).

Results: The GRS programme managed to improve beneficiaries' knowledge, attitude, and self-efficacy concerning HIV prevention. In doing that, GRS achieved its core objective. The increases, however, are modest and only significant for knowledge gain. Many beneficiaries did not increase their overall scores in the pre- and post-test questionnaire; the recognition of alcohol and drugs as risk factors for HIV/AIDS is relatively low. Furthermore, the programme operates in a difficult context with insufficient community involvement, constraint resources, and inadequate monitoring and evaluation. Volunteer retention is a major challenge, and there is a disjuncture between the GRS' theoretical approach and the practical implementation in Musina. Although the programme is considered a success by key informants, these factors combined with a lack of support from GRS and De Beers pose challenges to the programme's approach, its operations, and ultimately its sustainability.

Conclusion and Recommendations: The GRS provides a promising approach to HIV prevention. The programme in Musina however falls behind the potential of the organisation and the needs of the community. It needs to be more locally integrated, receive additional resources, and have better monitoring and evaluation. Programme activities ought to move beyond knowledge transfer and be closer to the actual GRS approach based on Bandura's Social Cognitive Theory, focusing on 12 to 14 year-olds, and include income generating activities. Further research should focus on actual programme implementation, longer term follow-up of beneficiaries, and assess the impact of the programme.

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List of Abbreviations

AIDS	Acquired Immune Deficiency Syndrome
ANC	African National Congress
CSR	Corporate Social Responsibility
DBCHAPP	De Beers Community HIV / AIDS Partnership Programme
GRS	Grassroots Soccer
FIFA	International Federation of Association Football
HIV	Human Immune Deficiency Virus
HSRC	Human Sciences Research Council
KI	Key informant
NGO	Non-governmental Organisation
SABCOHA	South African Business Coalition on HIV/AIDS
SCORE	Sports Coaches Outreach
Sig.	Significant
Std.	Standard Deviation
STI	Sexually Transmitted Infection
UNAIDS	United Nations Joint Programme on HIV/AIDS

UNICEF	United Nations International Children's Emergency Fund
ZAR	South African Rand

1. Chapter 1: Introduction

In this chapter an overview of HIV among adolescents in South Africa is provided, and the concept of using sports in HIV prevention efforts by the Grassroots Soccer (GRS) approach is introduced. Corporate social responsibility in the field of HIV in South Africa illustrated by the example of De Beers is outlined. A review of the pertinent literature is then provided, and following this the relevance and purpose of the study is presented.

The terms HIV, AIDS, and HIV/AIDS in this research report are used in accordance with the latest terminology guidelines as published by UNAIDS (UNAIDS, 2008b).

1.1. Overview of the HIV Epidemic in South Africa

In absolute numbers South Africa faces the biggest HIV epidemic in the world. The adult prevalence was 18.1% in 2007, meaning about 5.7 Million South Africans were living with HIV (UNAIDS, 2008). Adolescents and youth are particularly vulnerable to HIV (D'Angelo, Samples, Rogers, Peralta, & Friedman, 2006) and those aged 15-24 years account for 45% of all new HIV infections worldwide (UNAIDS, 2008a). South African youth have been particularly hard hit by the epidemic. Although less than 1% of the world's youth aged 15-24 lived in South Africa, the country accounted for 15% of all HIV infections in this age group globally in 2002 (UNICEF, 2002). In 2004, the South African Human Sciences Research Council (HSRC) found an annual incidence of 3.3% in the age group of 15-24 year-olds (Sishana et al., 2005). HIV prevalence in adolescents increased from 9.3% in 2002 to 10.3% in 2005 (Sishana et al., 2005).

Although improving access to treatment is important (Ford, Mills, & Calmy, 2009) for those already infected, preventing new infections remains the most feasible and cost-effective measure in the fight against HIV/AIDS (Creese, Floyd, Alban, & Guinness, 2002; Kort, 2008; Marseille, Hofmann, & Kahn, 2002; UNAIDS, 2008a).

Almost all South African media campaigns on HIV include adolescents amongst their primary target groups. As the HSRC observed, especially for young adolescents aged 12 to14 years, schools are the primary source of information about HIV/AIDS (Sishana et al., 2005). The Department of Health runs its own life-skills programmes in schools throughout the country, although it has limited success in changing high-risk behaviours (Magnani et al., 2005). In addition to government, a variety of privately funded and organised community-based, faith-based, and international non-governmental organisations are active in the field of HIV prevention in the region and in South Africa (Benotsch et al., 2004).

However, despite all existing efforts to raise awareness of HIV infection, several studies have observed that high-risk behaviours among adolescents in South Africa continue, including: low levels of condom use in females, having multiple concurrent partners and high levels of inter-generational relationships with young females having sexual intercourse with significantly older male partners (Sishana et al., 2005). Generally the individual risk perception of being at risk of HIV infection remains low (MacPhail & Campbell, 2001; Sishana et al., 2005). Prevention efforts thus far have not resulted in the substantial reduction in HIV incidence among young people that is needed to stem the HIV/AIDS epidemic in South Africa.

1.2. The Role of Sports Activities in HIV Prevention among Adolescents

In 2003 an interagency task force of the United Nations released a report entitled *Sports for Development and Peace*, which highlighted the potential of sports in contributing to achieving the Millennium Development Goals in general, and mitigating the HIV pandemic in particular (United Nations, 2003). In 2004, the potential for sports activities in mitigating the HIV epidemic was affirmed once more at the highest level by the United Nations Joint Programme on HIV/AIDS and the International Olympic Committee (UNAIDS, 2004).

Organised sports activities present an important environment in which to teach adolescents basic life-skills. These life skills include resilience and self-esteem. These skills can be useful to protect oneself from health risks such as HIV/AIDS. Team sports can be helpful in teaching young people to respect one another. The inclusive nature of soccer in particular allows for the integration of vulnerable groups and the reduction of stigma and discrimination against young people affected by or infected with HIV (Koss & Alexandrova, 2005; UNAIDS, 2004; United Nations, 2003).

Recognizing these opportunities, an increasing number of organisations in developing countries are using sports in general and soccer in particular to reach out and educate adolescents about life-skills, and use the opportunity to communicate messages of HIV prevention. The run-up to the 2010 FIFA (International Federation of Association Football) World Cup in South Africa has brought a considerable boost in donors' willingness to fund soccer-based community programmes on HIV in Africa and South Africa in particular. One of the emerging sports organisations to involve itself in HIV/AIDS health promoting activities is Grassroots Soccer Inc. (GRS).

1.2.1. The Grassroots Soccer and Social Cognitive Theory

GRS has been in existence as a registered charitable organisation since 2002. Box 1 provides an overview of GRS' current operations.

Box 1: Overview of Grassroots Soccer Inc.

In 2009 GRS works in 14 African countries and one Caribbean country. GRS' principal approach is to capacitate existing community-based organisations and thus implement the GRS curriculum in a locally adapted manner in as many places as possible. Its main objective is to undertake peer education activities related to HIV prevention. GRS' mission is to "use the power of soccer in the fight against AIDS by providing African youth with the skills and support to live HIV free" (Grassroots Soccer, 2008a). Hence soccer related activities are the organisation's primary way to reach out to adolescents and provide peer education. Providing income generating activities for at risk youth, teaching young entrepreneurs business skills, and providing positive diversions for boys and girls in poverty-affected settings are secondary objectives. By the end of 2007 about 230 000 adolescents had been trained by GRS and / or its partner organisations in basic knowledge of HIV and life-skills. The organisation has received funding from The Bill and Melinda Gates Foundation, corporate donors such as De Beers and committed individuals. In South Africa, the organisation works in five provinces, including Limpopo, where the programme was established in Musina in 2006. GRS' centre of operations is based in Cape Town, South Africa (Grassroots Soccer, 2008a).

Reviews suggest that HIV prevention programmes based on testable theoretical frameworks and theories of behaviour change are more successful than programmes without such a basis (Kirby et al., 1994). GRS developed an interactive soccer-themed HIV prevention and life-skills curriculum. The organisation's approach to HIV prevention is based on Albert Bandura's *Social Cognitive Theory* (Grassroots Soccer, 2008a).

Bandura points to a number of factors influencing sexual behaviour (Bandura 1994) amongst them are:

- perceived threat of HIV infection,
- degree of peer support for protective behaviour,
- social skills for negotiating protective behaviour,
- level of self-esteem, and
- perceived self-efficacy.

Basing HIV prevention activities on Bandura's *Social Cognitive Theory* means recognising that knowledge and awareness will only lead to protective behaviour if individuals possess the behavioural means, the necessary resources, and the social support to achieve such behaviour change. As such, Bandura proposes that effective HIV prevention programmes be built on four pillars (Bandura 1994).

- information to create awareness and knowledge of risky behaviours and benefits of healthy choices,
- skills development in order to translate concerns into preventive action,
- opportunities for guided practice in order to build resilient self-efficacy even in the face of setbacks, and
- enlisting and creating social supports in order to aid protective behaviour.

In order to create a stronger belief in individuals' capacities to perform desired behaviours and enhance social support, the use of role models is endorsed. Social cognitive theory points to the importance of the proximity of role model and beneficiary

GRS has incorporated the four pillars into their theoretical approach and curriculum. The GRS *Coaches Guide (Grassroots Soccer, 2008b)* provides GRS peer-educators (coaches) with more than 20 different participatory activities such as discussions, role plays and physical exercises to be performed together with the learners. These activities address, through playing games, crucial issues in HIV prevention and life-skills development such as transmission, risk perception, decision-making, avoidance, assertiveness, peer pressure, and gender roles. A normal GRS intervention comprises eight sessions covering basic knowledge about HIV and life-skills. Interventions in schools last approximately four weeks, during which time the GRS coaches repeatedly visit the classes. During specific events such as soccer training camps, an intervention can be completed in a considerably shorter period of time (e.g. one week). Initially GRS relied solely on famous soccer players to convey messages of HIV prevention to its beneficiaries (Clark, Friedrich, Ndlovu, Neilands, & McFarland, 2006). More recently there has been recognition of the importance of engaging 'local heroes' and GRS coaches tend to be recruited from the very communities they work in. This also makes the replication and roll-out of GRS activities more feasible. The organisation holds public graduation ceremonies for those who have successfully completed the GRS training and distributes the HIV magazine *Extra Time* among its graduates in order to enhance social support for its activities and the desired behaviours of their beneficiaries. In line with the existing evidence on effective HIV prevention in resource-poor settings,

GRS primarily works with 12-14 year-olds, targeting adolescents before they become sexually active (Clark et al., 2006).

1.3. Corporate Social Responsibility and HIV Prevention

Corporate social responsibility (CSR) relates to a notion of running business in a humane, ethical and transparent manner (Van Marrewijk, 2003). As governments are increasingly unable or unwilling to fulfil their traditional roles in social service provision, there is an increased level of public expectations towards businesses to assist in achieving development objectives such as the Millennium Development Goals (Muthuri, 2008). In South Africa, there has been a trend lately towards understanding CSR as a genuine partnership between communities and corporations (Hamann, 2004).

In the context of the HIV epidemic in South Africa the activities of the corporate sector can be understood from a purely economic angle – companies will benefit by keeping their workforce healthy – as well as from a broader CSR perspective. Whatever the motive, any CSR activity should in fact be seen as supportive to the business of a company and hence is at its core a business activity (Kapelus, 2002; MacDonald, 2008; Sanchez & Sotorrıo, 2007; Van Marrewijk, 2003).

HIV incidence and prevalence are particularly high in places where migrant workers mix with poor host communities, for example in the close vicinity of mining operations (Sishana et al., 2005; Williams et al., 2000). Recognizing this, almost two-thirds of mining companies had implemented HIV workplace policies and activities by 2007(SABCOHA, 2004). Increasingly, the activities are extended to the communities surrounding mining operations (Bloom, Bloom, Steven, & Weston, 2006). Evidence

shows that such community-based HIV programmes can be conducive to reducing incidence in the direct workforce (Williams et al., 2000). An example of such activities is provided in Box 2.

Box 2: De Beers Community HIV/AIDS Partnership Programme

As part of its CSR programme, De Beers committed ZAR 10 million a year, for at least three years (2006-2008), to a community-based HIV/AIDS programme. According to the company the intention of the De Beers Community HIV/AIDS Partnership Programme (DBCHAPP) is to extend what has already been implemented in the workplace into the communities, to facilitate the implementation of new programmes, and to support the efforts of Government in mitigating the epidemic. One of the key implementers of DBCHAPP is the GRS with its activities in Musina and Kimberley (De Beers, 2007).

The fact that GRS Musina programme is part of a CSR programme opens opportunities for financial, logistical and managerial support by De Beers through its general CSR programme and the Venetia mine close by.

1.4. Literature Review

As part of the background research for this study, a literature review was conducted to assess other evaluation studies and the evidence-base for the impact of school-based HIV prevention activities and organisations using sports as a vehicle. The literature review assessed school-based peer education programmes since GRS activities in Musina are predominantly based in a school setting.

Particular attention was paid to programmes that are part of CSR activities in southern Africa and their evaluation.

There has been a substantial amount of literature generated on HIV prevention programmes in African countries. Studies reviewed for this research examined the effectiveness of adolescent-targeted HIV prevention interventions in developing countries and emphasized the use of theoretical models and the need for monitoring and evaluation (Maticka-Tyndale & Brouillard-Coyle, 2006; Speizer, Magnani, & Colvin, 2003); the factors influencing protective behaviour such as condom use in adolescents (MacPhail & Campbell, 2001); and the development of frameworks and quality standards to measure the effectiveness of behaviour change interventions in developing countries (Medlin, Balkus, & Padian, 2008).

Among those papers that put forward theoretical frameworks, one case study using extensive qualitative methodology analysed the importance of the social context in HIV prevention. The paper suggested a conceptualisation of HIV-relevant aspects of social environments in three interacting dimensions: symbolic, organisational/network, and material/political context for successful HIV prevention in Southern Africa (Campbell, Foulis, Maimane, & Sibiya, 2005). Another article used Galtung's concept of structural violence to explain the economic, political, legal, religious, and cultural factors that impeded individuals in making choices and needed to be taken into consideration in HIV interventions. The article however focused mainly on treatment of HIV/AIDS (Farmer, Nizeye, Stulac, & Keshavjee, 2006). A review article pointed to the necessity of using ecological approaches to achieve sustained positive behaviour change in young people, and proposed an ecological framework based on the USA that could be adapted for

interventions in developing countries as was done in Brazil (DiClemente, Salazar, & Crosby, 2007).

Responses of the African education sector including school-based life-skills and HIV prevention programmes, have been described and assessed (Rispel, Letlape, & Metcalf, 2006). A review of eleven school-based programmes in sub-Saharan Africa showed that context-specific programmes targeted at adolescents can be successful but also pointed to the need to conduct more evaluation research (Gallant & Maticka-Tyndale, 2004). A process evaluation of a school-based adolescent sexual health intervention in Tanzania using extensive qualitative methods showed the potential gaps between programmatic approach and actual implementation. The paper pointed to some of the challenges concerning community reactions, peer educators and the role of teachers (Plummer, Wight, Obasi et al., 2007).

In South Africa specifically, Van der Lubbe and colleagues reported modest but significant knowledge gains and self-reported behaviour changes in adolescents after repeated exposure to a school-based HIV prevention programme in rural Mpumalanga. As the research was not an intervention study but rather a programme evaluation, the authors attempted to balance the absence of a control group by using a dose-response relationship approach in making their associations; however, the fact that the evaluators were also involved in running the programme may have introduced some bias (Van der Lubbe, Schinnij, & Tempelman, 2006). Magnani and colleagues describe significant albeit modest successes in knowledge and skills gain as well as behaviour change through school-based life-skills education in KwaZulu-Natal. Again, the study however

lacked a control group, a shortcoming that the researchers tried to balance by using econometric statistical models (Magnani et al., 2005).

The late 1990s brought the first wave of reports and publications on HIV/AIDS and its impact on the private sector in Africa (Moore, 1999; Quattek & Fourie, 2000; Rosen & Simon, 2003). Publications on business-initiated HIV programmes (Dickinson, 2004; GTZ, 2005; World Economic Forum, 2002) followed. Mahajan and colleagues in their review of work place programmes emphasised the need for impact research (Mahajan, Colvin, Rudatsikira, & Ettl, 2007). There are only very few descriptions of HIV/AIDS related peer education activities in the communities adjacent to the workplaces (Rispel, Peltzer, Nkomo, & Molomo, 2007). The literature on CSR community activities against HIV/AIDS remains very limited in numbers, in particular concerning studies which evaluate peer education activities.

Reflecting an increase in donor interest and activities in the potential for sports, there are a substantial number of operational guidelines on how to integrate sports activities and life-skills training and/or HIV prevention. The scientific literature remains however quite limited. Some studies have made associations between sports activities and adolescent sexual behaviour (C. E. Kaufman, Clark, Manzini, & May, 2004) and sports activities and HIV prevalence in mining communities (Gilgen et al., 2001). In both studies, however, sports-activities were not specifically used and evaluated as a medium for HIV prevention or life-skills training. Other studies have described the impact of sports programmes on life-skills development (Papacharisis & Goudas, 2005) in Europe, or evaluated the implementation of sports programmes aimed at HIV prevention in African countries (Clark et al., 2006; Kruse, 2006; Peacock-Villada,

DeCelles, & Banda, 2007). Serious doubts concerning the sustainability of internationally financed programmes were raised in one evaluation in southern Africa (Kruse, 2006). However the number of rigorous evaluations or impact assessments of such activities is small.

In conclusion, the evidence-base on the usefulness of sports as a medium of HIV prevention and life-skills training is very limited. This literature review did not find any study evaluating the effect of a school-based, corporately funded community sports programme aimed at HIV prevention in South Africa. This supports the need for this current study.

1.5. Research Question and Objectives of the Study

The above introduction and the review of the literature serve to highlight the fact that HIV is a substantial problem among South African adolescents and prevention efforts are various in approaches. However, incidence levels show that prevention efforts have not led to the dramatic reduction of incidence that is needed to stem the HIV epidemic. The integration of sports activities and HIV prevention efforts appears to be a promising approach, and is increasingly supported by donors and corporations. There is however, as noted above, a scarcity of rigorous evaluation of sports activities in the prevention of HIV, in particular when they are part of a CSR programme.

In an effort to fill this knowledge gap, the objective of this study was to evaluate a corporate-funded, school-based, HIV/AIDS prevention programme in South Africa using sports as a medium. The evaluation focused on GRS which uses soccer to train

knowledge of HIV/AIDS and life-skills to adolescents. This evaluation focused on process and outcomes (i.e. changes in beneficiaries' knowledge, and attitude) of the organisation's activities in Musina, Limpopo province.

The specific objectives of this study were to:

1. describe and document the implementation of GRS in Musina,
2. determine whether the programme objectives of GRS have been met,
3. determine barriers and facilitators to implementation of GRS' activities,
4. measure changes in HIV-related knowledge and attitude of the beneficiaries of the GRS.

This study is timely as South Africa is preparing for the FIFA Soccer World Cup 2010 and international donors and local organisations are engaging in soccer related HIV prevention activities. The intention is that this study will contribute evidence to inform planning and evaluation of the GRS activities in Musina and such sports related programmes in general. It could further be used by other investigators interested in evaluating HIV prevention activities using sports as a medium.

2. Chapter 2: Methods

This chapter describes the study design, the study setting and population. The sampling strategies, tools for data collection, the actual data collection and data analysis are explained. Potential sources of bias are elaborated on and steps taken to minimise bias are detailed. The chapter ends with a paragraph on ethical considerations.

2.1. The Study Design

The study aimed to evaluate the process and outcome of the GRS' HIV prevention activities among adolescents. The process evaluation employed a descriptive qualitative design, whereas the outcome evaluation used a quasi-experimental quantitative before / after study design.

For researchers to explain complex phenomena in public health it can be helpful to combine different methods of data collection and analysis (Baum, 1995). In addition, the incorporation of measurements taken from different angles can also enrich the description of a phenomenon and allows for a more comprehensive understanding of the subject matter (Malterud, 2001a). Hence, a triangulation of methods was used in this study in an effort to promote rigour in the evaluation of a health programme including its outcomes on its direct beneficiaries, the perceptions of the wider community, and the challenges and opportunities faced by its implementers. A combination of qualitative and quantitative methods was used as follows:

- semi-structured interviews with key informants,
- review of the organisation's annual reports and other relevant documents,

- analysis of data collected from beneficiaries using structured self-administered questionnaires.

Table 1 below summarizes the different sources of data and instruments used in order to achieve the objectives of the evaluation.

Table 1: Overview of Research Components

No	**Target of evaluation**	**Objectives**	**Methods**	**Instruments**
1	Key informants	Determine barriers and facilitators to implementation of the GRS activities	Interview	Semi-structured interview schedule
2	Work activities of GRS	Describe and document the implementation of the GRS in Musina; To determine whether the programme objectives of GRS have been met;	Record review	Checklist
3	Beneficiaries	Measure changes in HIV/AIDS related knowledge and attitude of GRS' beneficiaries	Interview	Structured self-administered questionnaires

2.2. The Study Setting

Musina, situated in Vhembe District (DC043), is the northernmost Municipality in the Limpopo province near the Beitbridge border-crossing to Zimbabwe. Vhembe District falls into the lowest economic quintile of the country, ranking 45th among South Africa's 53 districts. The fact that the district has the highest incidence of diarrhoeal diseases in children under five in the country provides further evidence of this high level of socioeconomic deprivation. While the HIV prevalence among antenatal clients stood at 13% in 2006, which is below national average, the incidence of sexually transmitted infections treated in Vhembe District is the highest in South Africa: at 10.4% (Health Systems Trust, 2006). The high incidence of sexually transmitted infections suggests high levels of high-risk sexual relationships.

In 2007, Musina Municipality had a population of 57,195 (Statistics South Africa, 2007). The author did not manage to obtain specific data as to the number of children aged between 12 and 14 (the actual target group of GRS) in Musina. At the time of research the Municipality also hosted a substantial population of mainly Zimbabwean refugees concentrated in the surrounding farms, streets and the so-called Showground in Musina town.

Agriculture, mining, and transport are the main economic activities in Musina Municipality. The unemployment rate stands at 25% (of 15 to 65 year-olds), with adolescents between 15-19 years having the highest percentage: 36%. Poverty is widespread, and over two-thirds (69.8%) of households survive on less than ZAR 800 / month (Municipality of Musina, 2009).

2.3. The Study Population

The study population for this research was the GRS programme and its beneficiaries in Musina, South Africa.

GRS in Musina is part of the DBCHAPP, associated to Venetia Mine which is situated close to Musina. GRS works primarily with children from primary and secondary schools in the township of Nancefield, which belongs to the Municipality of Musina. At the time of this research – in the beginning of 2009 – the local GRS programme consisted of one part-time coordinator and four volunteer peer-educators. The volunteer peer educators are considered GRS staff in this research. In 2008 a total of 256 adolescents were exposed to GRS life-skills and HIV prevention classes, 81 of whom graduated by filling the pre- and post-intervention questionnaires. In order to graduate, participants must complete the entire duration of a GRS intervention, which in a school setting usually comprise eight sessions over a time-span of approximately four weeks. The researcher managed to obtain a sample of 61 beneficiaries. The remaining 20 questionnaires could not be traced by GRS offices in Cape Town.

2.4. Data

In the following section the sampling strategy, the design of the research tools, and the process of collecting and analysing the different kinds of data are described.

2.4.1. Qualitative Data: Semi-structured Interviews

A semi-structured interview schedule was used to obtain key informants' perceptions and opinions of the GRS programme. The questions were designed to focus on process and perceived outcome. Individual interviews provide the possibility to examine personal experiences and perspectives of participants on subject matters (Mita K. Giacomini & Deborah J. Cook, 2000). The subject matter of this study is the process and outcome of the GRS programme in Musina. Semi-structured interviews were used in order to encourage open discussion between the researcher and key informants while at the same time ensuring that pre-defined areas of interest would be covered.

2.4.1.1. Key Informant Sampling

A total of ten key informants were purposively sampled with a view to involvement in and knowledge about the programme to be evaluated. The aim was to have representation from De Beers, GRS (including its staff in Musina), community structures and project partners with sufficient experience with GRS in the sample. Key informants were chosen following the researcher's own investigations, on suggestion of the GRS Coordinator in Musina, and on recommendation by the research supervisor. Preliminary analyses of initial interviews informed the approach to and conduct of successive interviews. After eight interviews all areas of interest were sufficiently covered to answer the research question satisfactorily. Little new information was expected to emerge from further interviews, i.e. saturation was reached.

2.4.1.2. Interview Schedule Development

Based on a previous evaluation of a similar programme (Rispel et al., 2007) and the author's own experience in managing a community-based HIV prevention programme elsewhere in Limpopo province (Ndlovu Care Group, 2009), an interview schedule was developed (Appendix 1). The schedule consisted of 13 open-ended questions covering the following areas of interest:

- involvement and role in the GRS programme,
- perceptions/views of the GRS programme's relationship with the community,
- programme implementation, including successes and limitations and perceived reasons for those,
- perceptions of impact of the programme on the community, and
- recommendations for programme improvement and/or future development.

In addition to these pre-defined areas of interest, the interview schedule gave interviewees the opportunity to bring up any issues not covered by the questions. The interview schedule was accompanied by an information sheet and a form of informed consent in English language (Appendix 2).

2.4.1.3. Piloting of Interview Schedules

All these tools – interview schedule, information sheet and consent form – were pre-tested in February 2009 on three individuals from the researcher's former workplace, an HIV prevention programme in rural Mpumalanga. These individuals had similar educational and cultural backgrounds as the prospective key informants. These pre-tests with people from similar backgrounds to those envisaged to be interviewed

allowed the researcher to assess issues such as clarity of language, necessary prompts, and time needed to conduct the actual interviews. In this way tools were developed that would be acceptable and easily understood by the target respondents as well as useful to answer the research questions effectively.

2.4.1.4. Data Collection with Semi-structured Interviews

All qualitative interviews were conducted individually by the researcher who also took notes during the interviews. Interviews were conducted during a field trip to Musina in March 2009, telephonically in May 2009, and during a visit to Grassroots Soccer's operational centre in Cape Town in June 2009. The interviews were conducted in English and the median time for the interviews was 38.5 minutes (range 21- 70).

2.4.1.5. Data Analysis from Semi-structured Interviews

In line with recommendations for qualitative research with limited data volumes, no specific software package was used (Webb, 1999). The analysis of the qualitative data collected in the semi-structured interviews was done by the researcher in four consecutive steps.

In a first analytical step all interviews were copied from the handwritten notes into Microsoft Word (Version 2007) documents using a computer. At this stage eight separate documents were created with the participants' answers joined to the questions reflecting the chronological flow of the interviews. In a second step all key informants'

answers were merged into one document. At this stage all answers remained joined to the respective questions and still reflected the chronological flow of the eight individual interviews. Eight different colour codes were applied to the eight individual key informants' answers, so that answers could always be traced back to key informants. This allows for re-contextualisation, even if answers are used in fragments at later stages of the analytical process (Malterud, 2001b). In a third step all answers were re-read carefully and re-ordered according to their content to the appropriate themes as pre-defined in the questions. Answers were then re-arranged according to the respective colour codes of the key informants to detect issues that were mentioned more than once by key informants, or key informants contradicting themselves. Statements that did not fit any of the pre-defined themes were collected and stored for potential analysis at a later stage. In the fourth analytical step, similar codes were grouped together and summarized under an analytical theme. Those statements that had not fitted with any pre-defined themes were dealt with in the same way. This process was repeated to the point where further abstraction was not seen as useful (Elo & Kyngas, 2008). Qualitative data analysis was repeated by the researcher four weeks after the initial analysis to confirm results.

2.4.2. Qualitative Data: Document Review

Document reviews are considered particularly helpful in studies of interventions influenced by policy, history or organisational aspects (Mita K. Giacomini & Deborah J. Cook, 2000). In order to complement the insights gained from the interviews, annual reports and other relevant documents of GRS' activities in Musina were sourced. GRS

in Musina, however, only does very limited documentation of its activities. During a visit to GRS' operational centre Cape Town in June 2009, the author obtained two *End of Year Reports (Grassroots Soccer, 2008a, 2009)*, one *Impact and Cost Analysis* report (Grassroots Soccer, 2009a), the *Coaches Guide* (Grassroots Soccer, 2008b) and one *Monitoring Book* (Grassroots Soccer, 2009b). These documents were read carefully using a checklist where needed pieces of information were documented. The documents were used as sources of information about the organisations work in general and about process and reported impact in Musina particularly. Findings of the semi-structured interviews and the quantitative research were put into context by using the content of the sourced and reviewed documents.

2.4.3. Quantitative Data: Self-administered Questionnaires

In order to measure changes in HIV-related knowledge, self-efficacy, and attitude of the beneficiaries of the GRS programme the author analysed existing quantitative data provided by the organisation.

Part of the routine monitoring and evaluation process of GRS is to conduct pre-and post-intervention (here called "challenge") data from its beneficiaries. The questionnaires used in the pre- and post-challenge are identical and standard in GRS Musina operations (Appendix 3). They consist of nine questions in English investigating knowledge, attitude, and perceived self-efficacy of participants. The knowledge questions (e.g. "Using condoms correctly during sex can help protect someone from getting HIV/AIDS") are taken from indicator 6.3 of target 6.A ("Have halted by 2015 and begun to reverse the spread of HIV/AIDS") of United Nations Millennium Development

Goal (United Nations, 2003a). One additional question refers to attitude ("If a relative gets sick with HIV/AIDS, I would be willing to care for him or her") and one refers to perceived self-efficacy ("I can avoid getting HIV/AIDS"). They are based on the GRS curriculum (Grassroots Soccer, 2008b). Some questions (e.g. "Consuming alcohol or drugs increases the risk of becoming infected with HIV/AIDS") refer to local specifics of adolescent life and the epidemic in South Africa. The questionnaires are not validated.

2.4.3.1. Sampling Strategy for Self-administered Questionnaires

Convenience sampling was used based on the availability of documented pre- and post-intervention questionnaires provided by the GRS' operational centre in Cape Town. The limitations of this sampling method are considered below.

Overall, the researcher obtained pre- and post-intervention data of 61 participants out of 81 who graduated from GRS activities in 2008 (Grassroots Soccer, 2009).

2.4.3.2. Data Collection in Self-administered Questionnaires

The data was collected in the Nancefield/Musina township as routine monitoring data by the peer educators of the GRS programme. It was collected during a school intervention in February / March 2008 and a soccer training camp in June/July of 2008. Identical questionnaires were given to beneficiaries before and immediately after the intervention. Participants were asked to complete the questionnaires individually. The completed pre- and post-intervention questionnaires were collected from GRS' operational centre Cape Town by the researcher in June 2009.

2.4.3.3. Data Analysis Self-administered Questionnaires

The quantitative data collected in the self-administered questionnaires was entered into SPSS (Version 17.0). Data from the completed pre- and post questionnaires was compared to assess the changes in knowledge, self-efficacy and attitude. The questionnaire used by the GRS gives participants three options of answering to the nine statements given in the questionnaire: 'Yes', 'No', and 'Not sure'. In addition several participants left some boxes blank rather than ticking one of the three options. Following the United Nations' handbook on *Monitoring Indicators for the Millennium Development Goals* (United Nations, 2003a), the option 'Not sure' was coded as a wrong answer and blank boxes were coded as missing values when entering the data into the SPSS database.

Tests for statistical significance of findings in quantitative analysis depend on the type of variable being analysed and whether the numerical data is normally distributed or not. The Kolmogorov-Smirnov and Shapiro-Wilk tests showed that for every variable tested the level of significance was <0.05 (Appendix 4). This means that the deviation of the sample from a normally distributed population was significant. Therefore non-parametric tests were used including Chi-Square test, Wilcoxon Signed Rank test, and the independent Sample test (Field, 2003). Along with the different types of analysis the tests used will be stated in the results section.

2.5. Potential Sources of Bias in the Research Design and Implementation

Bias is defined as “any process which produces results or conclusions that differ from the truth in a systematic way” (Joubert & Ehrlich, 2007). Bias can cloud effects that did occur, show effects that did not truly occur, or amplify or underestimate the magnitude of effects.

There is potential for investigator bias in analysing the data of the semi-structured interviews. Due to limited resources the collection, entry, and analysis of all data was handled by the researcher only. Investigator triangulation, the preferred method in qualitative research (M. K. Giacomini & D. J. Cook, 2000) was not possible. Potential bias was minimised by using a systematic four-step approach to the analysis of qualitative data. This systematic approach was repeated four weeks after initial analysis to confirm results.

There is also potential for selection bias in the fact that no current staff of De Beers/DBCHAPP could be interviewed as a key informant – neither at Venetia mine in Musina nor in Johannesburg (repeated requests for interview met with no response). This might have given a skewed perspective of the GRS processes and the role of De Beers. This bias was minimised by interviewing one former DBCHAAP senior staff member instead who had been involved in the GRS programme from its inception. Another source of selection bias might have been the purposive sampling of the key informants. The author tried to minimise this bias by basing the selection of the interview partners on a mix of sources: his own investigations, recommendations of his supervisor, and suggestions of the Grassroots Soccer staff.

Another source of selection bias might be linked to the beneficiaries who filled the quantitative questionnaires: Only those participants who completed all sessions of the GRS curriculum were allowed to complete the post-intervention questionnaire. In numbers this means that only 61 completed questionnaires were analysed although the intervention had reached 256 beneficiaries, of which 81 beneficiaries had completed its full course. This might have led to skewed results in the analysis.

Information bias might have been introduced by the fact that names of respondents were recorded on the GRS questionnaires and their self-administration was supervised by the locally known peer educators. Respondents might have given answers they regard as socially desirable rather than giving answers that were absolutely honest. Such 'social desirability' bias has been shown more common in behaviour related questions but has also been shown in questions referring to attitude, especially in adolescents (Gregson, Zhuwau, Ndlovu, & Nyamukapa, 2002; Z. Kaufman, 2008; WHO, 2006). Another source of this type of information bias might be found in key informants trying to impress the researcher and giving answers they thought advantageous to themselves and / or the programme. The fact that the researcher was a foreigner might have reinforced this.

Confounding bias is always a possibility in quantitative studies that are non-randomized. As this study did not contain a control group (all participants had received the intervention) randomization was not possible. This opens the results for the distorting influence of confounders associated with the exposure but not caused by it, such as exposure to related sources of HIV prevention information that was additional to the intervention. One example is the life-skills orientation which is standard in the curriculum

of schools in South Africa. Other confounders in this study include age, level of education, and current sexual activity.

In conclusion, a number of factors might have biased the results of this study. The author tried to minimise these factors. The potential for bias should, however, be kept in mind when reading the results, discussion, and conclusion of this study.

2.6. Ethical Considerations

The research protocol was approved by the Human Research Ethics Committee (Medical) of the University of the Witwatersrand in January 2009 (Appendix 8). Changes were approved in May 2009 (Appendix 9). All participation in the research was voluntarily, no remuneration was paid. There were no risks such as physical or emotional stress for study participants involved.

For the qualitative part of the study interviewees were informed about the purpose of the study, invited to participate, asked to read a study information sheet, and invited to sign the consent form before the start of the interview. Individuals were informed that they did not have to participate and could withdraw their participation in the process and would not be disadvantaged in any way. The venue of the interviews was in all cases determined by the interviewee. All data collected has been treated as private and confidential. No names were recorded on qualitative questionnaires. Qualitative questionnaires and consent forms have been stored separately. Only the researcher and his supervisor have access to the complete data. The GRS programme and DBCHAPP/De Beers will only have access to pooled information as provided in this research report.

Quantitative data analysis was based on data that was routinely collected for regular monitoring and evaluation purposes. Its collection is therefore not subject to ethics review (Lavery, Grady, Wahl, & Emmanuel, 2006). The secondary analysis of this data was approved by the University of the Witwatersrand Human Research Ethics Committee (Medical) in May 2009 (Appendix 9).

Benefit to participants is an important ethical principle for research. The research will benefit the participants indirectly as recommendations are made as to how to improve the GRS programme in Musina.

3. Chapter 3: Results

In this chapter the study results are presented and it is divided into two sections. The first section presents the results of the analysis of the qualitative data from the key-informant interviews. The second section presents the results of the analysis of the quantitative data from the self-administered questionnaires. The results of the document review are not presented separately but used to complement the findings of the interviews and questionnaires.

3.1. Key Informant Interviews

Eight of the ten key informants sampled were interviewed successfully for this study. Key informants interviewed comprised of:

- one manager from GRS Cape Town offices who had been responsible for GRS operations in Musina for 12 months when interviewed
- one former field intern of the Musina GRS programme who spent seven months working on setting up and assessing GRS operations including the Musina programme
- the coordinator of GRS in Musina who had been with GRS Musina for 30 months when interviewed
- one peer educator of GRS in Musina who had been with GRS Musina just over one year when interviewed
- one teacher of a school where GRS Musina works who had been collaborating with GRS for just over one year when interviewed

- a representative of the Youth Council in Musina who had been collaborating with GRS for 21 months when interviewed
- an NGO representative working with youth in Musina who had been observing GRS in Musina for three months when interviewed
- one former De Beers staff responsible for the DBCHAPP who was involved in the GRS programme during its initial 18 months.

Despite repeated attempts to make an appointment, the two current staff members of De Beers sampled and the representative of Musina Municipality could not be interviewed. The key findings that emerged from the key informant interviews are highlighted in Box 3 and elaborated further on below.

Box 3: Summary Results of Key informant Interviews

- The perceived geographical isolation of Musina, combined with poverty and a at times highly politicised environment forced GRS to overcome some initial obstacles and to adapt the organisation's approach.
- Community involvement is limited to implementation-aspects of the programme. There are divided opinions about the degree of community involvement and the role of political organisations.
- Successes of GRS are observed at an individual rather than at community level. Drivers of success are the peer educators. There is some confusion as to what constitutes a GRS success.
- Challenges include resource constraints, lack of support for the programme from GRS, and turnover of volunteers, thus putting GRS' sustainability at risk.
- Key informant recommendations include capacity building, further integration into the community, and improved monitoring and evaluation
- There appears to be a disjunction between GRS' theoretical approach and its practical work in Musina.

The results of the analysis of the semi-structured interviews are elaborated in five categories: contextual factors, community involvement, successes, challenges, and recommendations for the future. A further issue observed and addressed by the researcher is an apparent weakness in programme implementation.

3.1.1. The Importance of Contextual Factors

The accounts and opinions of the key informants about contextual factors that have shaped the start and the process of implementation of the GRS in Musina can be summarised in three sub-categories: socioeconomic deprivation, community members as gatekeepers, and geographical challenges.

3.1.1.1. Socioeconomic Deprivation

Every key informant interviewed referred repeatedly to the severe socioeconomic deprivation of the municipality and its people as a contextual background to the GRS programme. Issues mentioned frequently were the overcrowding of Musina, the refugee crisis, the lack of infrastructure and local capacity as well as the socioeconomic circumstances that drive adolescents into risky sexual behaviour. These socioeconomic circumstances were repeatedly mentioned in connection to HIV in young people. As one respondent put it:

“Some of the young people, especially the girls – it is a problem of poverty – they are poor. They look for sex to get something to eat.” (KI2)

Another key informant linked socioeconomic deprivation and unhealthy lifestyles leading to risky behaviours:

"Here, the young people, they drink a lot of alcohol. [...] They smoke, also dagga. Then they lose focus. And when you lose focus you engage in sexual intercourse." (KI1)

Respondents also referred to the influence of the socioeconomic situation on the approach GRS had to take when starting in Musina:

"You know GRS normally capacitates organizations. But in mining towns you won't find organizations. So you capacitate individuals, not NGOs." (KI7)

3.1.1.2. Gatekeepers in Musina

Several of the key informants referred to the particular challenges confronting GRS when coming into Musina with an HIV prevention programme targeting adolescents in schools. Concerned parents, church representatives, local politicians, and other organisations doing similar work were mentioned as initial gatekeepers and 'stumbling blocks' to the implementation of the programme. Respondents described parents as being reluctant to have their children educated about sexuality and the local representatives of religious groups being rather conservative. Furthermore, the high degree of political interests and different agendas of stakeholders and influential people in Musina and the competition for jobs with existing organisations doing similar work – such as Love

Life – were mentioned as at times making processes complex. Referring to politicisation one respondent noted:

"If all important stakeholders in the community are political, well that can make it difficult. (KI8)"

Overall, however, there was general agreement amongst key informants that these challenges had been of temporary nature and were successfully overcome in the further course of the programme. As one interviewee describes initial reactions in one primary school:

"They said, why are you talking about sex with our children. You are pushing them into something and some other activities. [...] GRS then clarified their syllabus to the parents. Now there is no problem anymore." (KI1)

Another respondent describes how the reactions by the community forced GRS to exchange the coordinator of the Musina programme. This shows how the negative reactions of the community had an influence on the selection of human resources of key importance to the GRS programme in Musina:

"The coordinator that GRS had recruited was not from the area. He did not have a good reception. [...]. No rollout was possible without the exchange of the coordinator." (KI7)

3.1.1.3. Geographical Challenges

Geographical issues were mentioned from two different perspectives. One angle mentioned several times was the nearby border with Zimbabwe and associated

challenges in terms of overcrowding, foreigners, refugees and highly mobile populations. Another issue mentioned was the perceived geographical isolation of Musina from the rest of South Africa, other GRS programmes, and the GRS operational centre in Cape Town. All key informants judged isolation as a negative condition. As one key informant phrased it:

"The difficulty in maintaining communication with Musina from Kimberley and Cape Town was a major factor shaping the programme." (KI6)

Lack of communication is also mentioned as a challenge in GRS' report to the funder De Beers for the year 2008 (Grassroots Soccer, 2009).

3.1.2. Community Involvement

This category on community involvement includes the findings in terms of perceived degree of interaction with the community as well as community actors that are perceived to be particularly involved and/or influential in GRS activities.

When key informants referred to the involvement of the community, they did so more often in terms of organisational and practical support than in terms of programmatic input or oversight. There was a noteworthy division of opinions amongst key informants as to the perceived and required interaction with the community of Musina. While some informants expressed satisfaction with the level of community involvement, others mentioned that GRS in Musina did not have enough ties and structured interaction with the community. One key informant stated that:

"The people who came here did well because they came to the relevant structures. That made the job easier for them; because they had the good contacts." (KI1)

A different key informant said however:

"We are pretty isolated in our work in Musina." (KI8)

According to the key informants, involvement with the community primarily related to interactions with community structures, sponsors and partners needed to implement activities. Asked which groups had influence on the GRS programme, respondents mainly mentioned the project partners. Several key informants also noted GRS' strong ties to political groups in Musina.

"The politicians: The ANC is part of the GRS." (KI3)

This contrasted with other key informants referring to the importance of political independence and trying to keep politicians at a distance from GRS activities.

"We try to stay away from any politically affiliated organization." (KI8)

3.1.3. Reported Successes

This category presents findings in terms of GRS' perceived successes including perceived impact on the community and the reasons therefore.

All key informants, as well as the reports to the funder (Grassroots Soccer, 2008a, 2009), described perceived and observed impacts on individuals rather

than the community at large. Several informants mentioned that it was too early and/or GRS activities too few to see changes at a community level. When asked to specify observed changes, informants mentioned anecdotally improved gender relations and the GRS team having developed important skills in terms of running a programme. Only one informant made a connection between individual change and community impact:

"Individual behaviour change also needs a community change. Then it is long lasting. But we are not yet there in Musina."(KI8)

The main perceived reasons for the reported successes lie in the GRS coaches – their skills, self-esteem, young age, and position within the community – and their work through the existing formal structure of schools.

"The ones who run GRS they are still young. So they understand what the needs of the youth are." (KI3)

An interesting issue observed by the researcher is the apparent confusion in some informants as to what exactly GRS and its staff are doing in the community. When asked about the successes of GRS and the perceived reasons for those two key informants answered:

"Leslie Manyathela, the late Orlando Pirates player. He was one of the products of GRS. "(KI4)

"I think it keeps the children away from many things. From 3.30 till 6.30 every afternoon they are busy with sports. They are away from the streets. One girl was even selected for the netball provincial squad." (KI4)

"Their tactics; they have a different way of playing soccer." (KI3)

Another key informant referred to the same confusion, explaining it by the various activities of the GRS donor:

"Maybe that was because De Beers had launched a soccer development programme in parallel. They organised competitions between the mines. Maybe that was where the confusion came from." (KI7)

3.1.4. Reported Challenges

The main challenges according to respondents lie in resource constraints and logistical difficulties. These two categories of challenges have a negative bearing on the operation and sustainability of the programme. More specific issues mentioned were the lack of necessary infrastructure such as office space or proper equipment to better plan and run the operations. Other interviewees referred to the challenges of communication with and support from GRS in Cape Town and Kimberley. One issue that was mentioned by almost all interviewees was the difficulty of motivating and retaining volunteers such as the GRS coaches. Several informants mentioned how coaches leave GRS as soon as they find work that is actually paid. According to GRS' own reports the organisation trained 24 volunteer coaches in 2007 but by mid-2009 only five of

them still worked for GRS (Grassroots Soccer, 2008a). One informant saw initial mistakes in the recruitment process as an underlying reason.

"Probably we targeted the wrong group for choosing our volunteers. In Musina we were more open to highly mobile people, young unemployed adults. They leave when something else comes up."(KI8)

This, according to another informant, also affects management and continuity negatively.

"Other NGOs are stealing our facilitators. I cannot be harsh with my people. If I am harsh to them, they say, ok good-bye I am leaving." (KI5)

Underlying reasons for the existing challenges were explained by informants primarily as a lack of financial resources and the fact that GRS set up its own programme, employing individuals rather than built on the existing capacity of a local organisation in Musina. Making a connection between lack of infrastructure, integration, and sustainability one informant stated:

"GRS is not going to be there all the time. But there is no existing structure." (KI7)

3.1.5. Key Informants' Recommendations

Recommendations for the future development of GRS in Musina focused on three main issues: integration within local structures, further capacity building for the coaches and the coordinator, and monitoring and evaluation. All were seen

as crucial for the success and sustainability of the programme. On capacity building one key informant said:

"The program needs a GRS staffer stationed in Musina for several weeks or months whose sole task it to train for and create autonomy for the Musina coaches."(KI6)

One issue mentioned by several key informants was the need for more rigorous monitoring and evaluation of the programme. Some informants described the current efforts as insufficient and mentioned the need of longer-term follow up as a crucial issue. As one informant put it:

"[...] we need to measure. Including the follow up, if you put so much [sic] resources into something. "(KI7)

3.1.6. Weakness in Implementation

During the interviews the researcher observed content that does not fall into any of the categories as pre-defined by the interview schedule: a disjuncture between the theoretical framework and its practical application in GRS' work.

For example, not one of the key informants referred to behaviour change and HIV prevention in the context of self-efficacy and/or attitude. A number of key informants mentioned raising awareness of and knowledge about HIV as the backbone for prevention and the core of GRS' activities. This description of the implementation of the GRS activities reflects a limited knowledge of the existing theoretical framework and a potentially incomplete implementation of the GRS

approach. References to fear messages and didactic teaching were repeatedly found in key informants' statements:

"We make sure that people copy the message: HIV is killing. The small ones do not have the understanding, so we teach them." (KI2)

"GRS is aware that people are dying without knowing of HIV; so GRS trains facilitators to teach learners about HIV." (KI5)

3.2. Pre- and Post Intervention Self-administered Questionnaires

The results of the analysis of data collected by GRS through the structured self-administered questionnaires are presented in three subsections. First – following Box 4 which summarizes the results – the sample is described in its general demographic characteristics. Then percentages and frequencies are shown for correct answers according to the questions. The differences between subgroups – stratified by age and gender – are also presented in this second sub-section. Third, summary descriptive statistics comparing pre- and post-intervention questionnaires are displayed, including a presentation of the results by age, gender, and knowledge questions only.

Box 4: Summary of Results of Pre- and Post-intervention Questionnaires

- The sample comprised 61 respondents of whom 35 were male and 26 female. The median age of females was slightly higher (14.5 years) compared to males (13 years).

- Beneficiaries made the biggest progress in learning that HIV is not the same as AIDS.
- Beneficiaries show only a minimal increase in correctly identifying the use of alcohol and drugs as risk factors for HIV transmission.
- Some questions actually received fewer correct answers after than before the intervention in some subgroups. Amongst them are those relating to condom use and the question referring to whether one can see if someone had HIV/AIDS.
- There is a significant increase in correct answers concerning the knowledge questions (mean 4.7 – 5.7 correct answers out of 7 possible) but not for self-efficacy or attitude questions.
- The majority of respondents increased their overall scores of correct answers (64%), but a considerable percentage actually gave fewer correct answers after the intervention than before: 21%.
- Females and younger beneficiaries generally start at higher levels of correct answers. When stratified by age, the highest increase in correct answers can be found in the actual target group of GRS: 12 to 14 year-old.

3.2.1. Demographic Characteristics of the Respondents

The sample analysed consisted of 61 respondents. The median age of the respondents was 13 years ranging from 9 – 20 years; 26 (43%) respondents where female and 35 (57%) were male (table 2).

Table 2: Demographic Characteristics of Respondents /graduating from the Grassroots Soccer programme conducted in Musina in 2008

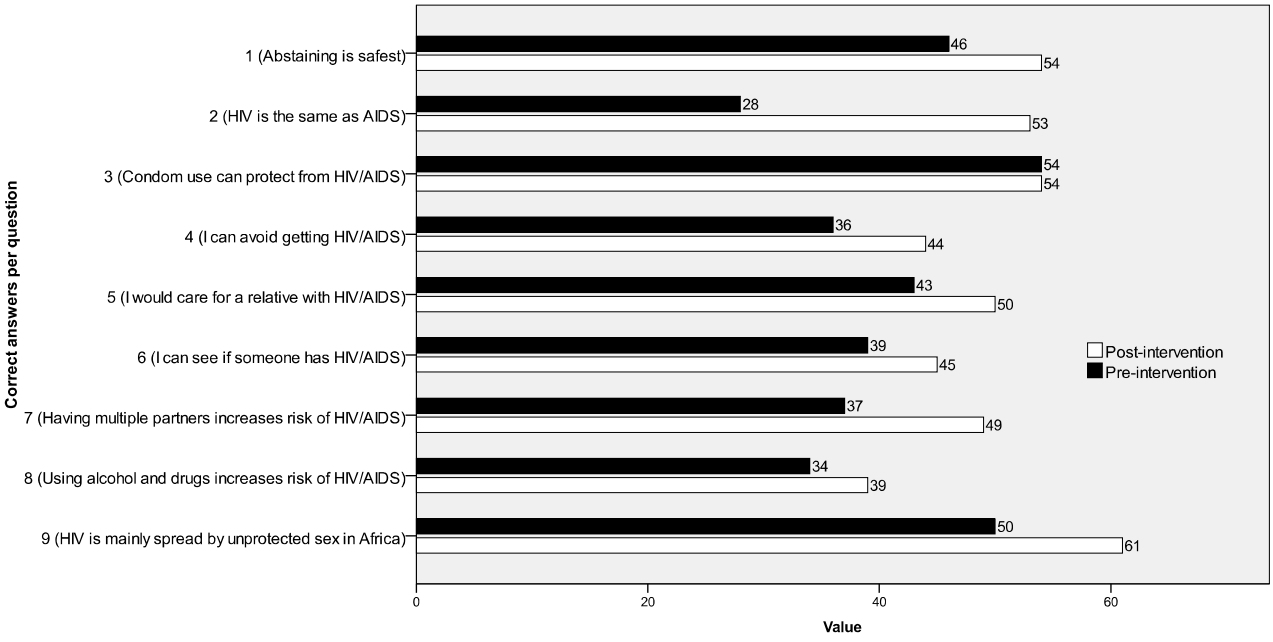
Sex	N	Minimum	Maximum	Median	Interquartile Range
Ages of both sexes	61	9	20	13	4
Age of females	26	11	20	14.5	5
Age of males	35	9	19	13	5

Table 2 shows the median age of female respondents was higher – 14.5 years – than that of male respondents: 13 years. The interquartile range is comparable between female and male respondents.

3.2.2. Comparing Pre- and Post-Intervention Results by Question

The first step of analysis is the comparison between the results of pre- and post-intervention questionnaires for the individual questions. The questions in the tables and the graph are paraphrased for better reading. The original questions can be found in Appendix 3.

Figure 1: Pre- and Post-intervention Results by Individual Question for All Respondents (N=61) /graduating from the Grassroots Soccer programme conducted in Musina in 2008



As can be seen in figure1, there are considerable differences between the questions when comparing correct answers before and after the intervention. With only 28 respondents giving correct answers, participants showed the lowest pre-intervention level for question 2 and the highest for question 3: at 54 correct answers. While question 2 shows the highest increase in correct answers, question 3 shows no change at all in absolute numbers. Question 8 which refers to alcohol and drugs shows low starting levels, a very low increase and consequently the lowest end-result with only 39 respondents correctly agreeing with the statement.

Missing values are not shown in graph 1. Missing values did not change results considerably. Appendix 5 shows a table including all missing values.

Table 3: Male and Female results compared by schoolchildren pre- and post-intervention/graduating from the Grassroots Soccer programme conducted in Musina in 2008

	Male (N=35)			Female(N=26)		
Question	Pre-Correct Frequency (%)	Post-Correct Frequency (%)	Difference Frequency (%)	Pre- Correct Frequency (%)	Post-Correct Frequency (%)	Difference Frequency (%)
1 (Abstaining is safest)	26 (81%)	29 (88%)	3 (7%)	20 (77%)	25 (96%)	5 (19%)
2 (HIV is the same as AIDS)	12 (41%)	28 (85%)	16 (44%)	16 (62%)	25 (96%)	9 (34%)
3 (Condom use can protect from HIV/AIDS)	29 (85%)	30 (91%)	1 (6%)	25 (96%)	24 (92%)	-1 (-4%)
4 (I can avoid getting AIDS)	18 (53%)	25 (74%)	7 (21%)	18 (72%)	19 (73%)	1 (1%)
5 (I would care for relative with HIV/AIDS)	20 (59%)	25 (76%)	5 (17%)	23 (89%)	25 (96%)	2 (7%)
6 (I can see if someone has HIV/AIDS)	17 (57%)	25 (76%)	8 (19%)	22 (85%)	20 (77%)	-2 (-8%)
7 (Having multiple partners increases risk of HIV/AIDS)	22 (67%)	25 (71%)	3 (4%)	15 (58%)	24 (92%)	9 (34%)
8 (Using alcohol and drugs increases risk of HIV/AIDS)	17 (50%)	20 (59%)	3 (9%)	17 (65%)	19 (73%)	2 (8%)
9 (HIV mainly spread by unprotected sex in Africa)	30 (86%)	29 (85%)	-1 (-1%)	20 (77%)	24 (92%)	4 (15%)

The highest increase of knowledge was found in question 2, i.e. understanding that HIV is not the same as AIDS. The question on condom use shows a high starting point in both sexes (question 3). However in females the percentage of correct answers is actually lower after than before the intervention. The same phenomenon can be observed in males when asked whether unprotected sex was the main way HIV is spread in Africa (question 9). A stark contrast between sexes can be observed in the answers to question 7 about multiple partners as a risk factor for HIV: while females start off on a lower level of correct answers they almost all recognize multiple partners as a risk factor after the intervention: 24 (92%). The change in opinion in males is comparably smaller and outpaced by the females. The lowest overall scores in both sexes before and after intervention relates to question 8 concerning the use of alcohol and drugs as risk factors for HIV.

In total, there were 24 children between 12 and 14 year (the actual target group of GRS) old that completed the questionnaire pre- and post-intervention. The other age groups, 9 – 11 year olds and 15 – 20 year olds consisted of 14 and 23 children, respectively.

Table 4: Results for the 12 -14 year old schoolchildren pre- and post-intervention/graduating from the Grassroots Soccer programme conducted in Musina in 2008

	12 – 14 years (N = 24)		
Question	Pre- Correct Frequency (%)	Post- Correct Frequency (%)	Difference Frequency (%)
1 (Abstaining is safest)	19 (79%)	23 (96%)	4 (17%)
2 (HIV is the same things as AIDS)	9 (38%)	22 (92%)	13 (53%)
3 (Condom use can protect from HIV/AIDS)	23 (96%)	21 (88%)	-2 (-8%)
4 (I can avoid getting AIDS)	17 (71%)	21 (88%)	4 (17%)
5 (I would care for relative with HIV/AIDS)	17 (71%)	21 (88%)	4 (17%)
6 (I can see if someone has HIV/AIDS)	16 (67%)	21 (88%)	5 (21%)
7 (Having multiple partners increases risk of HIV/AIDS)	14 (58%)	22 (92%)	8 (34%)
8 (Using alcohol and drugs increases risk of HIV/AIDS)	10 (42%)	20 (83%)	10 (41%)
9 (HIV is mainly spread by unprotected sex in Africa)	18 (75%)	21 (88%)	3 (13%)

Table 4 shows a comparison of pre- and post-intervention results of that target group of 12 – 14 year olds. The results of the other age groups can be found as appendix 6.

The highest increase in correct answers can be found in question 2. This is in line with the results of the complete group of respondents (as seen in figure 1). In contrast to the results of the complete group however, there is also a high increase – more than 40% - in correct answers in question 8 about alcohol use and risk of HIV/AIDS. In general, the scores of correct answers after the intervention are high: no percentage below 80%.

3.2.3. Summary Pre- and Post Intervention Results

In the third step of the analysis summary descriptive statistics comparing pre- and post-intervention questionnaires for all questions are presented. A mean score of correct answers was calculated for all respondents.

In instances where there are two sets of scores from repeated measures on the same subjects to compare, the Wilcoxon Signed-Rank Test is used to test for statistical significance (Field, 2003).

Table 5: Mean score out of nine achieved by schoolchildren pre- and post-intervention/graduating from the Grassroots Soccer programme conducted in Musina in 2008

	N	Mean	95% confidence interval	P-value
Correct pre-intervention	61	5.9	5.4 - 6.4	
Correct post-intervention	61	7.2	6.7 - 7.7	
Increase pre- and post-intervention		1.3		$p < 0.001$[1]

1. Calculated by Wilcoxon Signed-Rank Test

As can be seen in table 5, there has been an increase in the mean of correct answers calculated for all questions and respondents when comparing pre- and post-intervention questionnaires: from 5.9 to 7.2 out of possible nine correct answers. The difference is significant.

While self-efficacy and attitude are measured by only one question – question 4 and 5 respectively – knowledge is measured by the remaining 7 questions.

Table 6: Knowledge results for all schoolchildren (N=61) pre- and post-intervention/graduating from the Grassroots Soccer programme conducted in Musina in 2008

	N	Mean	95% confidence interval	P-value
Knowledge pre-intervention	61	4.7	4.2 – 5.1	
Knowledge post-intervention	61	5.7	5.3 – 6.0	
Increase pre- and post-intervention		1.0		$p < 0.001$ [1]

Table 6 shows a mean increase of one correct answer (4.7.–5.7) out of seven possible correct answers for the seven questions that aimed specifically at testing respondents' knowledge of HIV prevention. The difference is significant.

Table 7 shows the differences for all respondents measured by comparing the number of correct answers post- and pre- intervention for all nine questions.

Table 7: Changes in Overall Scores by All schoolchildren (N=61) pre- and post-intervention/graduating from the Grassroots Soccer programme conducted in Musina in 2008

Answers	N
Correct post-intervention > correct pre-intervention	39
Correct post-intervention = correct pre-intervention	9

Correct post-intervention < correct pre-intervention	13
Total	61

As can be seen in table 7, 39 out of the 61 (64%) respondents improved their overall score in the post-intervention questionnaire when compared to the pre-intervention questionnaire, i.e. had more answers correct. For nine participants the overall score did not change, and 13 respondents actually gave fewer correct answers in the post-intervention test than they had done in the pre-intervention test.

Table 8: Correct Pre- and Post-intervention Questionnaire Answers for Male and Female compared with schoolchildren pre- and post-intervention/graduating from the Grassroots Soccer programme conducted in Musina in 2008

Sex		N	Mean	95% confidence interval	Increase pre- and post-intervention	P-value
Female	Correct pre-questionnaire	26	6.7	6.1 – 7.3		
	Correct post-questionnaire	26	7.9	7.3 – 8.5	1.2	0.012[1]
Male	Correct pre-questionnaire	35	5.3	4.6 – 6.0		
	Correct post-questionnaire	35	6.7	6.0 – 7.4	1.4	0.002[1]

1. Calculated by Wilcoxon Signed-Rank Test

Table 8 shows that there was an increase in mean number of correct answers for both males and females when pre- and post-intervention questionnaire are

compared. The difference is significant in males (p=0.002) and females (p=0.012). Females on average start off at a higher level of correct answers.

Table 9: Increase in Correct Answers pre- and post-intervention According to Age Groups /graduating from the Grassroots Soccer programme conducted in Musina in 2008

Age / Answers		N	Mean	95% confidence interval	Increase of correct answers pre- and post challenge	p-value
9-11	Correct pre-challenge	14	4.8	3.5 – 5.1		
	Correct post-challenge	14	5.9	4.9 – 6.8	1.1	p = 0.202[1]
12-14	Correct pre-challenge	24	5.8	5.1 – 6.6		
	Correct post-challenge	24	8.0	7.2 – 8.8	2.2	p < 0.0001[1]
15-20	Correct pre-challenge	23	6.6	5.9 – 7.3		
	Correct post-challenge	23	7.2	6.6 – 7.8	0.6	p = 0.215[1]

In table 9 results are divided in three age groups for analysis. This shows the specific results of the target group (12 to14 year-olds) compared to the results of beneficiaries younger (9 to 11 year-olds) and older (15 to 20 year-olds) than the actual target group. The older age group starts off at a higher level but shows

little increase of correct answers. The younger group starts off lowest, and shows a slight increase in correct answers. The highest increase of correct answers can be found in the target group of 12 – 14 year olds. This is also the only age group where the increase is statistically significant.

4. Chapter 4: Discussion and Conclusion

This chapter summarizes the principle findings of this study as pertinent to the research question. Strengths and weaknesses are discussed, including in relation to other, similar studies. The core of the chapter presents a discussion of the principal research findings and recommendations for the future work of GRS in Musina. The chapter ends with summary conclusions and indicates areas of potential further research.

4.1. Principal Findings

This study aimed to evaluate the process and the outcome of the GRS HIV prevention activities in Musina.

The GRS programme in Musina operates in a difficult context and with insufficient community involvement, resource constraints, and inadequate monitoring and evaluation. There is an apparent disjuncture between the GRS theoretical approach and its practical implementation in Musina. These problems, combined with a lack of support by the GRS Cape Town and De Beers and a massive attrition of volunteers, pose challenges to the programme's approach, its operations, and ultimately its sustainability. Key informants reported about successes at an individual level and explain those achievements by the strength of the peer educators (section 3.1).

The programme managed to improve beneficiaries' knowledge, attitude and self-efficacy concerning HIV prevention. The increases however are modest and only

significant for knowledge gain; the recognition of alcohol and drugs as risk factors for HIV is relatively low. A considerable number of beneficiaries did not increase their overall scores in the pre- and post-test questionnaire (section 3.2.). The organisation achieves its best results in its actual target group: 12 to 14 year-olds.

Overall, it could be concluded that GRS had achieved its core programme objective in terms of positively influencing its beneficiaries' knowledge, attitude, and self-efficacy concerning HIV prevention. However, the organisation has faced challenges in starting and implementing the programme. Hence its successes come at a high price and with question marks concerning sustainability.

4.2. Strengths and Limitations of the Study

The key strength of this study is its triangulated approach. The majority of studies and reviews rely solely on either quantitative data (Agha & Van Rossem, 2004; Clark et al., 2006; Gallant & Maticka-Tyndale, 2004; J Kinsman et al., 2002; Magnani et al., 2005; Ross et al., 2007; Speizer et al., 2003) or qualitative data (Plummer, Wight, Obasi et al., 2007; Plummer, Wight, Wamoyi et al., 2007; Rajan & Franca-Koh, 2007) when describing and evaluating or reviewing adolescent HIV prevention programmes. There are a few selected studies that combine qualitative and quantitative methods of data collection and analysis (Ahmed et al., 2006; Botcheva & Huffman, 2004; Z. Kaufman, 2008; Rispel et al., 2007), however very few researchers have used key informant interviews. This

study therefore adds new evidence to this currently small body of mixed methods evaluative research. The key informant interviews provided an important additional perspective by allowing processes and outcomes, successes and challenges to be seen through the eyes of the implementer and main stakeholders.

A further strength of this study is the independence of the author. The fact that the author is neither affiliated to GRS nor to De Beers/DBCHAAP and has received no financial support or salary from any party for the execution of this research is likely to have supported openness of key informants in the qualitative interviews and objectivity in the analysis and reporting of findings.

There are a number of limitations to this study that need to be taken into account when interpreting its findings.

In as much as key informant interviews open an important perspective on the process of implementation, they do not give direct insights into the actual implementation of the GRS's core intervention: HIV prevention and life-skills programmes for adolescents. The only way to gain a systematic account of the quality of the actual sessions would have been through participant observation. Participant observation was however not part of this study. It can never be assumed that programmes are implemented exactly according to theory and plan (Gallant & Maticka-Tyndale, 2004; Plummer, Wight, Obasi et al., 2007). The lack of a direct and systematic observation and analysis of the activities through participant observation limits the possibility of explaining the quantitative results of the study.

In the absence of biological markers such as HIV incidence and measures of sexual behaviour, the GRS in Musina uses questionnaires that measure knowledge, attitude, and self-efficacy. In fact, only findings for knowledge change were statistically significant. Although knowledge has been shown to be an important antecedent for behaviour (A. Bandura, 1994, 2001; Albrecht Bandura, 2004; Medlin et al., 2008), for the lack of biological markers and a more comprehensive questionnaire this evaluation was only able to measure outcomes of the intervention in quite a limited way.

Reviews show that knowledge gain in HIV prevention might be transient in nature (Medlin et al., 2008; Speizer et al., 2003). Therefore measuring changes directly after the intervention but not after a considerable follow-up period provides only limited information on actual knowledge gain and retention.

The findings of both components of the study allow only for limited inferences due to the very small size of the samples: eight for the key informant interviews and 61 for the pre- and post-questionnaires.

4.3. Discussing the Principal Findings

This subsection relates the most important findings of the study to the research question and the existing body of research in the field of adolescent targeted HIV prevention programmes in southern African countries. The subsection then discusses the findings' implications for GRS and similar programmes. First the findings from the key informant interviews are discussed; then follow the findings

from the pre- and post questionnaires. Recommendations are made for the GRS programme in Musina.

Principal Finding # 1: Contextual challenges as barriers to the start of the programme

As reported in a similar study which evaluated the Soul City/De Beers HIV/AIDS Community Training Partnership Programme in several South African mining towns (Rispel et al., 2007) the severe socio-economic deprivation, substance abuse, and the remoteness of the target communities are important contextual factors which influenced the start and implementation of the programme. Given the high HIV prevalence in South Africa these factors can create a situation where rolling out an HIV prevention programme for adolescents is a matter of urgency and a highly complex undertaking at the same time. The complexities mainly emerge from the lack of qualified staff, insufficient infrastructure, and the community jealously controlling the distribution of resources and potential employment. In addition to these complexities the GRS programme in Musina – in contrast to the Soul City/De Beers programme – had to deal with the initially negative reactions towards the programme from a number of gatekeepers. Similar observations such as conservative and at times hostile local communities have been reported in a number of studies and reviews (Gallant & Maticka-Tyndale, 2004; J Kinsman et al., 2002; Maticka-Tyndale & Brouillard-Coyle,

2006; Plummer, Wight, Obasi et al., 2007) describing the implementation of (adolescent-focused) HIV programmes.

Principal Finding # 2: Community involvement is insufficient

Negative community reactions might be prevented or reduced by involving key stakeholders right from the planning and inception phase of programmes using a bottom up approach (Buse, Mays, & Walt, 2005). However, in the programme analysed – as in many similar programmes in Africa –the target community's involvement is limited to the actual implementation of the programme. The community is informed and asked for support rather than invited to give programmatic input at earlier stages. GRS currently does not have written endorsement for its activities from any official stakeholder. Such an approach may speed up the roll-out of programmes and may allow reporting results to donors more rapidly as was confirmed by some of the key informants interviewed for this study. Given the pressure of the HIV epidemic and the donor dependency of many organisations such an approach appears logic. It might have been supported by a donor community which has only very recently started moving from an output-focused monitoring towards a more outcome/impact driven evaluation approach in its reporting requirements. Health policy analysis has shown however, that top-down approaches which do not involve the implementers in programme planning and decision-making often lead to lack of ownership and cooperation (Buse et al., 2005). Furthermore, top-down approaches give little opportunity for community empowerment. One example are

the volunteer peer educators who appear to not be involved in designing the programme but solely implement a programme designed in a top down manner. The top down implementation of DBCHAPP through GRS in Musina is also not in line with current understanding of CSR as genuine partnerships with communities and corporations as described by Hamann (Hamann, 2004). Therefore, such approaches may not be conducive to long-term programme success and sustainability. Communities antagonised by top-down approaches may be difficult to convince of collaboration even if programme managers intend to change their ways of operating.

Principal Finding # 3: Successes are observed at an individual level and the peer educators are the drivers of success

Adolescent sexual behaviour change depends on a number of factors that go beyond the individual. They include factors such as societal norms and morals, peer influences, and socioeconomic environment (MacPhail & Campbell, 2001). Such community-level factors and changes were not measured in this study but are nevertheless crucial for adolescents to adopt protective lifestyles. Key informants did not refer to community changes but rather focused on individual changes. As observed in the Soul City/De Beers evaluation the implementing team of has benefited from the skills gained in running the programme and from an improved standing in the community (Rispel et al., 2007). The same holds true for the staff of GRS Musina. It might be argued that this fulfils the GRS objective of building entrepreneurial skills for its staff.

Studies of school-based interventions have shown that pupils can at times find it difficult to trust their own teachers in environments of corporal punishment and sexual abuse (Plummer, Wight, Obasi et al., 2007; Plummer, Wight, Wamoyi et al., 2007). Peers in contrast have been shown to have major influence on adolescent sexual views and behaviour (MacPhail & Campbell, 2001). The peer-educator model based on local youth has been described as component of successful adolescent-targeted HIV prevention in Africa by other authors (Brieger, Delano, Lane, Oladepo, & Oyediran, 2001; Speizer, Tambashe, & Tegang, 2001) and reflects Bandura's observation of the necessary proximity of model and person taught (Bandura 1994). As seen in the and elsewhere (Plummer, Wight, Obasi et al., 2007), peer education can find its challenges in peer educators' low education levels, their contradictory sexual norms and activities, and socioeconomic as well as societal pressures (Plummer, Wight, Obasi et al., 2007; Wight et al., 2006). This research has shown that GRS staff in Musina face at least challenges in terms of low levels of education and socioeconomic as well as societal pressures.

To reduce attrition rates one intervention in rural Uganda focused on recruiting slightly older, married volunteers, as they tended to be more geographically stable. Also, cash incentives appear to be helpful in motivating and retaining volunteer staff (J Kinsman et al., 2002).

Principal Finding # 4: GRS' sustainability is put at risk by lack of volunteer retention and insufficient support

The challenges to GRS' work in Musina are quite similar to those reported by other studies, namely the lack of qualified staff, resource constraints, and motivation and retention of volunteer staff (Plummer, Wight, Obasi et al., 2007; Rispel et al., 2007). It appears odd and unsustainable for HIV prevention programmes to continue relying on volunteer staff in extremely impoverished communities. People who are struggling to feed themselves and their families tend to use volunteer positions as stepping stones to formal employment (Van Wyk, Strebel, Peltzer, & Skinner, 2006) and/or chose income generation over volunteering if awarded the possibility as recognised it GRS's own annual report to the funder (Grassroots Soccer, 2008a).

Making volunteers the backbone of a whole programme – as done by GRS in Musina – can be considered naive at best and exploitation at worst, given that the programme is part of the corporate social responsibility programme of the most profitable diamond mine in South Africa. It also contradicts GRS own objective of creating employment in impoverished communities. The consequences of such an approach are felt by the programme in Musina: In 2007 24 GRS coaches were trained to work under the supervision of the local coordinator. During data collection in March and June 2009 the researcher was informed that there were only four coaches left working with GRS in Musina. This presents a formidable challenge for the local coordinator as well as for GRS headquarters, and has had substantial operational consequences: in 2007 and 2008 a cumulative 505 beneficiaries graduated from the GRS challenge, i.e. they had successfully completed the HIV and life-skills training as manifested by filling

the pre- and post intervention questionnaire. It is interesting to note that the number of beneficiaries who graduated decreased dramatically over the period: while 424 adolescents graduated in 2007, only 81 were trained and graduated in 2008 (Grassroots Soccer, 2008a, 2009). Although no data was available as to the actual size of the target group (adolescents between 12 and 14 years of age) it is unlikely that the decreasing number of graduates is a result of saturation of the target group: There are no reports of a dramatic drop in fertility or of massive outmigration in Musina, both of which could make the target group shrink. Rather, it can be expected that the pool of adolescents between 12 and 14 years of age is of similar size every year.

Furthermore, lack of support and supervision from management level, i.e. GRS' operational centre in Cape Town and the HIV coordinator of the local De Beers mine are factors impeding the programme. This can be explained, but not justified, by the geographical isolation of the Musina programme and its lack of priority for GRS and De Beers which were mentioned by some key informants.

Principal Finding # 5: There seems to be a disjuncture between GRS' theoretical approach and its practical implementation

One further challenge detected during the qualitative interviews is the apparent disjuncture between the GRS theoretical approach based on Bandura's Social Learning Theory and GRS' practical activities focused primarily on didactic knowledge transfer. A number of studies have shown that there often is a

considerable difference in actual implementation of programmes compared to planned approaches (Kaaya et al., 2002; J. Kinsman et al., 2001; Medlin et al., 2008). Oftentimes, poor implementation cannot be detected through the standard output oriented monitoring tools used in many programmes. It was not possible to judge in how far the implementation lags behind the planned approach and its theoretical basis. The key informant interviews however suggest that there might indeed be a lack of capacity when it comes to implementing a participatory programme based on Bandura's Social Learning Theory. Similar challenges have been reported elsewhere (Medlin et al., 2008; Plummer, Wight, Obasi et al., 2007).

Another area where GRS Musina departs from the general GRS approach is the decision taken in Musina to create a new organisation (GRS Musina) rather than to capacitate an existing local organisation. Building on pre-existing and accepted local structures, and using local organisations' strong ties with the communities and their on-the-ground knowledge is considered a key component of success by GRS (Grassroots Soccer, 2008a). By not using this approach in Musina, GRS might have taken the wrong decision. In combination with the lack of support, resources, and community participation in the design of this new organisation, this diversion from the general GRS approach poses a challenge to sustainability.

Principal Finding # 6: There is insufficient supervision and monitoring and evaluation

The lack of supervision is reflected by the apparent disjuncture between the theoretical GRS approach and its practical implementation by the Musina staff, and their feeling of being deserted by GRS and De Beers' nearby mine. Meaningful supervision should be supported by monitoring and evaluation; however, monitoring is currently limited to pre- and post-test questionnaires given to beneficiaries. GRS in Musina does very little documentation of activities and receives only sporadic field support visits from the operational centre Cape Town or GRS staff based in Kimberly. The evaluation planned by De Beers and GRS was cancelled at the end of 2008. Poor monitoring and evaluation is in fact an issue that has been brought up by numerous reviews (Gallant & Maticka-Tyndale, 2004; Maticka-Tyndale & Brouillard-Coyle, 2006; Medlin et al., 2008; Speizer et al., 2003) of adolescent HIV prevention programmes. It deprives implementers, funders, and policy makers of important information for programme planning. Furthermore it threatens to undermine the justification of HIV prevention for adolescents (Medlin et al., 2008).

Principal Finding # 7: The GRS programme has successfully changed respondents' knowledge, attitude, and perceived self-efficacy

The GRS programme in Musina managed to positively change its beneficiaries' knowledge, attitude, and self-efficacy. The changes are biggest in the group of 12 to 14 year-olds; the actual target group of GRS. With that, GRS has achieved its core programme objective. Numerous studies (Magnani et al., 2005; Plummer, Wight, Obasi et al., 2007; Van der Lubbe et al., 2006) and reviews (Gallant &

Maticka-Tyndale, 2004; Maticka-Tyndale & Brouillard-Coyle, 2006; Speizer et al., 2003) of adolescent-focused HIV prevention programmes and several published (Clark et al., 2006) and unpublished (Botcheva & Huffman, 2004; Z. Kaufman, 2008) evaluations of GRS' activities have shown it feasible to change adolescents' knowledge and attitudes. The same publications have shown that change of behaviour is also possible. However, behaviour change is more difficult to achieve and to prove in an evaluation than change of knowledge and attitudes. That said, the majority of existing evidence is not very strong. Evaluations of peer educator based programmes hardly ever go beyond the adequacy level of evidence. This means that all that is proven is that the intervention was implemented and the expected changes occurred. Other external factors which could have contributed to the measured changes are not taken into account (Habicht, Victora, & Vaughan, 1999; Maticka-Tyndale & Brouillard-Coyle, 2006). This study does not add substantially new or stronger quantitative evidence to the existing body of adequacy level evidence. The very small sample size does not allow inferences on individual measures beyond the actual respondents. Confounding was neither excluded nor dealt with comprehensively.

The fact that younger beneficiaries generally show greater improvements than their senior peers is in line with the results of similar studies (Magnani et al., 2005). It substantiates experts' claim to start HIV prevention programmes with adolescents before they engage in sexual activities. Risky behaviour is more

difficult to change than to prevent in the first place (Gallant & Maticka-Tyndale, 2004).

Experience shows that knowledge is the one variable which can be relatively easily improved and measured in programmes (Medlin et al., 2008). The results of this study are in line with this experience. When discussing the observed positive changes in attitude and self-efficacy, it has to be taken into consideration that the GRS questionnaire uses only one question each to measure attitude and self-efficacy respectively. Single questions however are considered insufficient to measure whole psychological constructs such as attitude or self-efficacy (Gallant & Maticka-Tyndale, 2004). This weakens the validity of the questionnaire. In general it is questionable if a questionnaire which is used as a tool to routinely monitor and report programme activities, is a sufficient means to evaluate the outcome of GRS activities in Musina.

Principal Finding # 8: Questions referring to alcohol and drugs as risk factors for HIV prevention show the lowest frequency of correct responses

A convincing body of evidence supports the view that alcohol and substance abuse is linked to diminished rational capacity, associated with unsafe environments, and has implications for HIV risk. This holds particularly true in societies where chauvinist male stereotypical behaviour is common (Morris & Parry, 2006; Sishana et al., 2005; UNAIDS, 2008a). Given the widespread use of alcohol and the epidemic proportion of sexual violence and its associations with HIV infection in South Africa (Baleta, 2006), the low frequency of correct

responses when asked to identify alcohol and drugs as risk factors for HIV is somewhat confusing. The lack of appreciation of alcohol and drugs as risk factors might mirror the customariness of alcohol and drug abuse in Musina's youth – as reported by key informants and observed in other areas of socioeconomic deprivation especially rural settings (Sishana et al., 2005). It might also be caused by the lack of proper implementation of the relevant modules of the intervention as discussed in principal finding # 5.

Principle Finding # 9: A considerable number of respondents perform worse in the post-test than they had done in the pre-test

A worrying observation is that 13 (21%) of all respondents actually showed fewer correct answers in the post-test compared to the pre-test assessment. Part of the interpretation of this apparently negative finding lies in the fact that the entire questionnaire only consisted of nine questions. This might make changes in overall scores appear rather dramatic. The worst results for a single question can be found for question 6 ("I can see if someone has HIV/AIDS"). Detailed analysis of the raw data shows that the number of respondents who ticked the option "not sure" for this question in the post-questionnaire is considerably higher than for the other questions. As the option "not sure" was counted as a wrong answer for this study, this may partly explain the actual increase in wrong answers. The insecurity of respondents might reflect confusing messages given by the GRS peer educators in the sessions or respondent's difficulties in understanding the question.

4.4. Recommendations for the Grassroots Soccer Programme

Based on the discussion of the key findings of this study, three recommendations can be put forward to GRS in Musina and GRS operational centre Cape Town.

Recommendation # 1: Increase the resources allocated the programme

There is a strong need to increase the resources spent on the programme. This includes providing office space for the coordinator and providing monetary remuneration for volunteers. Although studies have shown that community-based programmes can be successfully run by volunteers who may require very little funding (J Kinsman et al., 2002), professional public health programmes need to move beyond employing semi-skilled volunteers with unreliable time-commitments. Without improved staff retention, further capacity building, and increased resources, GRS in Musina risks losing relevance or even facing disintegration. Especially in times of economic crisis, it is crucial that De Beers remains committed to CSR. This commitment needs to be shown by continued and increased support to the programme. Reducing expenditure by cutting the support of community peer education programmes should not be considered. After all, HIV prevention as a CSR activity can be considered an essential business operation. It can protect and improve the health of the current and future workforce. Furthermore it may positively contribute to acceptance of the company by the community.

Recommendation # 2: Increase the involvement of local stakeholders and enhance community participation

GRS needs to substantially increase the systematic, official and transparent involvement of local stakeholders. This could help the programme in Musina to become more integrated into the community and hence be more sustainable. Such involvement needs to go beyond having activities rubber-stamped by local authorities and sporadically reporting about them. Close collaboration with existing local programmes of social development for young people can be effective in improving social environments important for HIV prevention in South Africa. This holds particularly true in areas of socio-economic deprivation (Campbell, Nair, & Maimane, 2007; Farmer et al., 2006). The ultimate aim of GRS activities needs to be to build the capacity of a self-sustainable and well-integrated community-based organisation. Such an organisation could continue work in Musina once GRS concludes its programme.

Recommendation # 3: Improve supervision, monitoring and evaluation

In order to justify the resources spent and motivate for additional resources to improve the programme, systematic supervision, and monitoring and evaluation need to be implemented in GRS activities in Musina. A balance needs to be found between a practical tool for routine monitoring and a more comprehensive tool that actually allows for appropriate evaluation. Even for routine monitoring a questionnaire needs to be developed that sufficiently covers all areas of

intervention and allows for a more comprehensive understanding of the quality of the training. GRS furthermore needs to invest more into the training and supervision of its peer educators. This will improve programme implementation and also support retention of staff.

4.5. Conclusions and Areas of Further Research

The GRS provides an innovative and promising approach to HIV prevention in adolescents. The peer-educator based programme attracts young adolescents and successfully teaches them knowledge about HIV prevention and potentially instils positive changes in attitude and self-efficacy. As the programme is soccer based, it has the potential to also reach out to male adolescents, a group which is traditionally difficult to reach in HIV prevention. Being based in schools, it can work with large numbers of adolescents in a relatively structured way. The organisation's work is generally well documented and has repeatedly been positively evaluated in for the most part unpublished studies. Its staff are committed to sports and HIV prevention in Africa. Although the organisation is relatively young it has already managed to scale up its operations to an international level and attracts substantial international funding. With the FIFA World Cup coming to Africa, available funding will potentially increase even more and create the fiscal space for similar activities by GRS and other organisations. GRS has become a leader in the field of HIV prevention through sports.

Given this background it is a pity that the programme in Musina has been implemented in a way that leaves so much to be desired. GRS Musina has managed to influence its beneficiaries positively and hence met its core objective. The organisation however has run its operations in an effectively unsustainable way. The objectives of creating employment and skills can hardly be considered met. The programme lacks integration, its staff are diminishing and its operational output has reduced dramatically since inception. Given the resources at hand – ZAR 10 Million annually for all DBCHAAP programmes – the successful model and the donor's willingness to further support the programme, GRS Musina should be able to flourish and play a leading role in the fight against HIV in adolescents. For this to be realised at the least the three recommendations given in this study need to be implemented. As this study was being completed, some initial steps in terms of volunteer remuneration and improved supervision and monitoring were taken by the organisation.

Future evaluation studies should include longer term follow-up of beneficiaries as changes of adolescent reproductive health knowledge, attitude and self-efficacy tend to be transitory in nature (Speizer et al., 2003). Such follow-up should go beyond the five months included in the existing GRS evaluations (Botcheva & Huffman, 2004; Clark et al., 2006; Z. Kaufman, 2008) where knowledge has been proven to be retained albeit at reduced levels. Future research furthermore should include behavioural aspects. GRS has proven that it can improve knowledge, attitude and self-efficacy in adolescents. These are important antecedents of behaviour change and relatively easy to influence (Gallant &

Maticka-Tyndale, 2004; Speizer et al., 2003). As in the majority of HIV prevention programmes, it however remains unclear whether beneficiaries actually translate these changes into positive and protective behaviours. The reliability of self-reported behaviour measures is contested and highly dependent on the research tool (Kugler et al., 2007; Plummer, Wight, Obasi et al., 2007). Therefore biological end-points such as STI incidence, teenage pregnancy or ultimately HIV transmission could be used to assess the ultimate impact of the programme in a controlled trial. The use of a validated behavioural surveillance monitoring tool is also recommended to investigate programme impact. Such research should also include qualitative components such as participant observation, focus groups discussions, and interviews in order to fully understand the quality of programme implementation and the societal context. This will allow linking programme implementation to programme outcomes and ultimately culminate into an impact assessment. Issues such as the low frequency of correct answers concerning alcohol and drugs as risk factors and respondents showing deterioration of results would then become explicable. Well-funded organisations such as GRS have a responsibility to continue undertaking and publishing operational research and evaluations from which less well-off actors should learn. If De Beers / DBCHAP is serious about HIV prevention and CSR they will give GRS their full support this important endeavour. A healthy community is, after all, in De Beers' best interest.

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Appendices

Appendix 1: Interview Schedule for Key Informants

Interview schedule for key informants

1. Organization / Location …….
2. Position/ Designation ……..
3. Date of interview ……..
4. Result codes 01 = Completed , 02 = Respondent not available, 03 = Respondent refused; 04 = Partially completed ☐ 05 = Other .....

5. Are you familiar with the Grassroots Soccer Club? [Yes] [No]

5(a) If yes, for how many months have you been involved in / with the Grassroots Soccer Club?

____months

5.(b) Could you please tell us about your role in / your relationship with the Grassroots Soccer Club?

6. Were there any particular contextual factors in Musina that shaped the approach and implementation of the Grassroots Soccer Club? (Needs, expectations, limitations, pressures)

7. In your opinion, which groups had a major influence on the Grassroots Soccer Club development and implementation (probe politicians, media, trade unions, NGOs/CBOs, Civil society, HIV/AIDS advocacy groups)

8. Could you share with us how the community in Musina was involved in developing and/ or implementing the Grassroots Soccer Club?

9. In your opinion what impact the Grassroots Soccer Club has had on the community of Musina?

10. (a) What do you think have been the main successes of the Grassroots Soccer Club?

10. (b) In your opinion, what were the reasons for these successes (probe: political, technical, managerial, funding, public opinion/ support)

11. (a) In your opinion, what have been the main constraints/ obstacles and/ or challenges to the Grassroots Soccer Club (probe political, technical, managerial, funding, public opinion /support)

11. (b) In your opinion, what were the reasons for these?

12. What recommendations do you have for strengthening or the future development of the Grassroots Soccer Club?

13. Are there any other comments which you wish to make?

Thank you very much for agreeing to participate and for assisting us.

Appendix 2: Information Sheet and Informed Consent Form Key informant Interviews

Information Sheet

Evaluation of the process and the impact of the grassroots soccer club programme in Musina, South Africa

Good day. My name is Tobias Luppe; I am a student of Public Health at the University of the Witwatersrand in Johannesburg. I am conducting an evaluation of the process and impact of the Grassroots Soccer Club in Musina. This evaluation is part of my research project necessary to obtain my Masters degree in Public Health.
The purpose of the evaluation is to describe the implementation and the impact of the Grass Roots Soccer Club in Musina. This includes the facilitators and/ or barriers to the activities of the Grassroots Soccer Club in Musina.

I wish to invite you to participate as a key informant because of your knowledge/ and or experience of the Grassroots Soccer Club. I would like to ask you questions about your role in the Grassroots Soccer Club, your opinions of the programme in general, and any recommendations you may have on programme strengthening or future development. This is not a test, and there are no right or wrong answers. You will not be disadvantaged in any way for the answers you give.

If you agree to take part, it will take about 45 minutes of your time. You may refuse to answer any questions that you don't want to answer. You may say that you don't know the answer to a question. I ensure that all information provided by you will be used for the evaluation purposes only. Everything that you say will be treated as private and confidential. This means that apart from the person who asks you the questions, no one will know your specific responses, as all the information will be pooled in the final report.

Should you be willing to give your consent and participate, I would like to thank you for your time and for the information you are willing to share. There are, however, no direct benefits in a form of incentives or money attached to your participation in this study. You have the right to refuse to participate, withdraw

your consent or discontinue your participation at any point during the interviews without penalty.

If you have any questions about your rights as a study participant, or questions or concerns about any aspect of the study, you may contact me on 076 0629125. You may also contact the University of the Witwatersrand Committee for Research on Human Subjects on 011 717-1234. *You may keep this information sheet.*

Consent Form Interview

Evaluation of the process and the impact of the grassroots soccer club programme in Musina, South Africa

I……..*(full name),* hereby agree to participate in the evaluation of the process and impact of the Grassroots Soccer Club.

The study has been explained to me and I have had a chance to ask questions. I have freely chosen to take part. I am aware that I can change my mind about taking part at any time and leave without any penalty. I have been told that this is an interview that will not be of personal benefit to me. I have been told that my answers will remain confidential and that this consent form will not be linked to the answers I give.

I have been given a telephone number that I may call if I have any questions or concerns about the evaluation.

Signature Date

	Kolmogorov-Smirnov[a]	Shapiro-Wilk

Appendix 3: Pre-and Post-intervention Questionnaires of the Grassroots Soccer Programme in Musina

GRS Player Registration

Name:

Surname:

Nickname:

Age: 10 11 12 13 14 15 16 17 18 **Other age:** _____

Gender: BOY GIRL

Ref #:

Grassroot Soccer Challenge

EXAMPLE	A soccer ball is round.	**Agree**	**Disagree**	**Not Sure**
1	The most effective way to avoid HIV/AIDS is to abstain from sex (to not have sex at all)	**Agree**	**Disagree**	**Not Sure**
2	HIV is the same thing as AIDS.	**Agree**	**Disagree**	**Not Sure**
3	Using condoms correctly during sex can help protect someone from getting HIV	**Agree**	**Disagree**	**Not Sure**
4	I can avoid getting HIV/AIDS.	**Agree**	**Disagree**	**Not Sure**
5	If a relative became sick with HIV/AIDS, I would be willing to care for him or her.	**Agree**	**Disagree**	**Not Sure**
6	I can tell if someone has HIV/AIDS by looking at him or her.	**Agree**	**Disagree**	**Not Sure**
7	Having more than one sexual partner can put someone at higher risk for getting HIV/AIDS	**Agree**	**Disagree**	**Not Sure**
8	Drinking alcohol or taking drugs can put someone at risk for getting HIV/AIDS	**Agree**	**Disagree**	**Not Sure**
9	Unprotected sex is the most common way HIV/AIDS spreads in Africa	**Agree**	**Disagree**	**Not Sure**

PRE POST

GRS Player Registration

Name:

Surname:

Nickname:

Age: 10 11 12 13 14 15 16 17 18 **Other age:** _____

Gender: BOY GIRL

Ref #:

Grassroot Soccer Challenge

EXAMPLE	A soccer ball is round.	**Agree**	**Disagree**	**Not Sure**
1	The most effective way to avoid HIV/AIDS is to abstain from sex (to not have sex at all)	**Agree**	**Disagree**	**Not Sure**
2	HIV is the same thing as AIDS.	**Agree**	**Disagree**	**Not Sure**
3	Using condoms correctly during sex can help protect someone from getting HIV	**Agree**	**Disagree**	**Not Sure**
4	I can avoid getting HIV/AIDS.	**Agree**	**Disagree**	**Not Sure**
5	If a relative became sick with HIV/AIDS, I would be willing to care for him or her.	**Agree**	**Disagree**	**Not Sure**
6	I can tell if someone has HIV/AIDS by looking at him or her.	**Agree**	**Disagree**	**Not Sure**
7	Having more than one sexual partner can put someone at higher risk for getting HIV/AIDS	**Agree**	**Disagree**	**Not Sure**
8	Drinking alcohol or taking drugs can put someone at risk for getting HIV/AIDS	**Agree**	**Disagree**	**Not Sure**
9	Unprotected sex is the most common way HIV/AIDS spreads in Africa	**Agree**	**Disagree**	**Not Sure**

PRE POST

N=61	Statistic	df	Sig.	Statistic	df	Sig.
Correct pre-intervention	0.163	61	0.000	0.925	61	0.001
Wrong pre-intervention	0.163	61	0.000	0.925	61	0.001
Correct post-intervention	0.252	61	0.000	0.847	61	0.000
Wrong post-intervention	0.252	61	0.000	0.847	61	0.000
Age	0.150	61	0.002	0.946	61	0.009
a. Lilliefors Significance Correction						

Appendix 4: Test of Normality

Appendix 5: Pre- and Post-intervention Results by Individual Question for All Respondents (N=61) /graduating from the Grassroots Soccer programme conducted in Musina in 2008

Question	Pre-Correct Frequency (%)	Pre-missing values	Post-Correct Frequency (%)	Post-missing values	Difference Frequency (%)
1 (Abstaining is safest)	46 (79%)	3	54 (92%)	2	9 (13%)
2 (HIV is the same as AIDS)	28 (51%)	6	53 (90%)	2	25 (39%)
3 (Condom use can protect from HIV/AIDS)	54 (90%)	1	54 (92%)	2	0 (2%)
4 (I can avoid getting AIDS)	36 (61%)	2	44 (73%)	1	8 (12%)
5 (I would care for relative with HIV/AIDS)	43 (72%)	1	50 (85%)	2	7 (13%)
6 (I can see if someone has HIV/AIDS)	39 (70%)	5	45 (76%)	2	6 (6%)
7 (Having multiple partners increases risk of HIV/AIDS)	37 (63%)	2	49 (80%)	0	12 (17%)
8 (Using alcohol and drugs increases risk of HIV/AIDS)	34 (57%)	1	39 (65%)	1	5 (8%)
9 (HIV is mainly spread by unprotected sex in Africa)	50 (82%)	0	61 (88%)	1	11 (6%)

Appendix 6: Results for different age groups compared by schoolchildren pre- and post-intervention/graduating from the Grassroots Soccer programme conducted in Musina in 2008

	9-11 years(N=14)			15-20 years(N=23)		
Question	Pre-Correct Frequency (%)	Post-Correct Frequency (%)	Difference Frequency (%)	Pre- Correct Frequency (%)	Post-Correct Frequency (%)	Difference Frequency (%)
1 (Abstaining is safest)	9 (64%)	12 (86%)	3 (22%)	18 (78%)	19 (83%)	1 (5%)
2 (HIV is the same things as AIDS)	3 (21%)	10 (71%)	7 (50%)	16 (70%)	21 (91%)	5 (21%)
3 (Condom use can protect from HIV/AIDS)	10 (71%)	10 (71%)	0 (0)	21 (91%)	23 (100%)	2 (9%)
4 (I can avoid getting AIDS)	10 (71%)	9 (64%)	-1 (-7%)	9 (39%)	14 (61%)	5 (22%)
5 (I would care for relative with HIV/AIDS)	9 (64%)	7 (50%)	-2 (-14%)	17 (74%)	22 (96%)	5 (22%)
6 (I can see if someone has HIV/AIDS)	3 (21%)	7 (50%)	4 (29%)	20 (78%)	17 (74%)	-3 (-4%)
7 (Having multiple partners increases risk of HIV/AIDS)	8 (57%)	10 (71%)	2 (14%)	15 (65%)	17 (74%)	2 (9%)
8 (Using alcohol and drugs increases risk of HIV/AIDS)	8 (57%)	7 (50%)	-1 (-7%)	16 (70%)	12 (52%)	-4 (18%)
9 (HIV is mainly spread by unprotected sex in Africa)	11 (79%)	10 (71%)	-1 (-7%)	21 (91%)	22 (96%)	1 (4%)

Appendix 7: Approval of the University of the Witwatersrand Human Ethics Committee (Medical)

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

Division of the Deputy Registrar (Research)

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)
R14/49 Luppe

CLEARANCE CERTIFICATE	**PROTOCOL NUMBER M081155**
PROJECT	Evaluation of the Grassroots Soccer Club HIV & AIDS Programme in Musina, South Africa
INVESTIGATORS	Mr T Luppe
DEPARTMENT	School of Public Health
DATE CONSIDERED	08.11.28
DECISION OF THE COMMITTEE*	Approved unconditionally

Unless otherwise specified this ethical clearance is valid for 5 years and may be renewed upon application.

DATE 09.01.30 **CHAIRPERSON** .....
(Professor P E Cleaton Jones)

*Guidelines for written 'informed consent' attached where applicable

cc: Supervisor : Dr D Blaauw

DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and **ONE COPY** returned to the Secretary at Room 10004, 10th Floor, Senate House, University.
I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. **I agree to a completion of a yearly progress report.**

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES...

Appendix 8: Approval of Amendments to the Study Protocol by the University of the Witwatersrand Human Research Ethics Committee (Medical)

University
of the Witwatersrand,
Johannesburg

Human Research Ethics Committee (Medical)
(formerly Committee for Research on Human Subjects (Medical))

Secretariat: Research Office, Room SH10005, 10th floor, Senate House • Telephone: +27 11 717-1234 • Fax: +27 11 339-5708
Private Bag 3, Wits 2050, South Africa

20 May 2009

Mr Tobias Luppe
73a 1st Avenue
MELLVILLE
2092

Dear Mr Luppe

RE: Amendments to research protocol M081155

This letter serves to confirm that the Chairman of the Human Research Ethics Committee (Medical) has reviewed and approved the following changes on the abovementioned protocol:

- Objective 4 'To Measure Changes in HIV&AIDS Related Knowledge and Attitude of the Beneficiaries of the Grassroots Soccer Club' (page 4)
- The use of existing data and conducting a secondary data analysis (page 5)
- Measuring knowledge and attitude of a group of beneficiaries, comparing pre-and post intervention data (page 7)
- Deletion of appendix 2 (questionnaires)

Thank you for keeping us informed and updated.

Yours sincerely,

Anisa Keshav
Secretary
Human research Ethics committee (Medical)