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Health outcomes of double orphans raised in grandfamilies: An analysis of the prevalence and determinants of disease in South Africa, 2017.

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A research report submitted to the Schools of Public Health and Social Sciences, university of the Witwatersrand, Johannesburg, in partial fulfilment of the requirements for the award of the degree of Master of Arts in Health Demography.

Date: July 2020

Declaration

I, Likoko Salmon, declare that this research report is my original work. This research work is being submitted for the degree of Masters in Health Demography at the University of the Witwatersrand, Johannesburg. To the best of my knowledge, this work has not been submitted for any degree or examination to any other university.

……

July 2020.

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Abstract

Globally the number of orphans has been increasing and currently stand at 153 million. The increase is due to war, HIV and Aids, and migration among others. South Africa recorded 631 000 double orphans in 2015. Only two-thirds of children in South Africa have been perceived to have positive health by their caregivers. Although a vast number of studies have focused on the mental health of orphans who are raised in grandfamilies in South Africa, there is a dearth of literature that investigates the physical health (in particular, disease outcomes) of double orphans raised in grandfamilies in South Africa. The study examined the levels and socio-demographic characteristics associated with disease outcomes among double orphans (0-14 years) raised in grandfamilies in South Africa, 2017. The study used the National Income Dynamic Study 2017 data. Prevalence of disease was calculated and multinomial logistic regression was run using STATA version 14. Only 6.57% of children aged 0-14 years in South Africa were double orphans raised in grandfamilies in 2017. The study found 93% of double orphans to be in good health. More double orphans showed to have acute diseases as compared to those with chronic diseases (5% and 2% respectively). Sex of double orphans [RRR 4.609 CI 1.003 – 21.183], perceived health status [RRR 0.054 CI 0.006 – 0.445], [RRR 0.026 CI 0.002 – 0.407], and health check-up in the last year [RRR 0.008 CI 0.001 – 0.106], [RRR 0.13 CI 0.002 – 0.032] proved to be significant predictors of the health outcomes of double orphans. Double orphans are more at risk of having acute and chronic diseases verses having no disease. The study concluded that the socio-demographic and health characteristics of double orphans affect their disease outcomes. Further research needs to be done on the health outcomes of double orphans raised in grandfamilies in South Africa, and social grands need to be accompanied by other social services.

CHAPTER 1: INTRODUCTION

1.1. Background

The structure of a population and that of a family in particular, are known to be influenced by demographic dynamics. Processes such as fertility, mortality, and migration are continuously influencing such structures. Adult mortality has been seen to directly bring about changes in the household size, age structure among families, and changes in the headship of the household due to HIV and Aids (Jhamba & Mmatli, 2016). With such changes, family structures have moved from nuclear to becoming more complex. With such different family structures in place, one which has increasingly become interesting is grandfamilies, as this family structure has become more common in African countries (Hall & Sambu, 2015; SAHRC & UNICEF, 2016)

A grandfamily is understood as a family in which a grandparent is primarily responsible for the care of grandchildren without the presence of a biological parent, and is the head of household, and the bread winner (Aransiola et al., 2017; O'Hora & Dolbin-MacNab, 2015). Such responsibilities are recognised as social-economic roles by grandparents looking after grandchildren in traditional African societies (Aransiola O et al., 2017; Lombard & Kruger, 2009). This form of family structure is a result of adult mortality, mostly due to HIV and Aids and road fatalities, which leave behind orphans in need of care (Kanamori et al., 2015; Lombard & Kruger, 2009). Orphanhood is a broad concept, and the three known types of orphans are, a child that has experienced the death of a mother (maternal orphan), one with a deceased father (paternal orphan), and children whose both parents are deceased (double orphans) (Embleton et al., 2014; Hosegood, 2008; Sinha et al., 2016).

Globally, the transition to grandparenthood and the importance of grandparents as primary caregivers of grandchildren have been of much concern for decades. About 10% of grandparents in the world live with one or more grandchildren in a household (Pulgaron, Marchante, Agosto, Lebron, & Delamater, 2016; Sinha et al., 2016). In the African continent, there are about 12 million vulnerable and orphan children, with caregivers of orphans and vulnerable children accounting for 28.6% in Zambia, and 27% in Swaziland and Namibia respectively in the year 2007 (Kanamori et al., 2015). In the Sub-Saharan African region, grandfamilies are fairly common. A study by Aransiola and colleagues (2017) indicated that only in four Western African countries (Ghana, Liberia, Nigeria, and Sierra Leone) a total of 20 841 households were grandfamilies during the 2013-2014 period. In Cameroon, Nsagha & colleagues (2012) indicated that in the year 2010, there were 304 000 children under 18 years orphaned by Aids, and projected that by the year 2020 the number will increase to 349 000, bringing an increase in orphanhood and grandfamilies.

The percentage of children not living with their biological parents is quite high in South Africa. In 2010 alone, children not living with both biological parents in South Africa were indicated to be 17% in urban areas and 32% in rural areas (Hall & Posel, 2012). The percentage of orphans in South Africa differ by years. With the use of different nationally representative South African surveys from 1993 to 2005, Ardington & Leibbrandt (2010) showed the proportion of maternal and paternal orphans increased from 2.4% to 6.9% and 8.7% to 16.6% respectively, and for double orphans, the increase was from 7.9% to 18.5% from 1993 to 2005. Estimations from the year 2005 further showed that by the time a child becomes 17 years of age, 29.4% of children became paternal orphans, 12.9% maternal orphans, and 7.4% become double orphans (Ardington & Leibbrandt, 2010). In the year 2015, the total number of double orphans was reported to be 631 000 in South Africa (Hall & Sambu, 2015). Looking by province, in 2010, using a sample of 2 477 caregivers

of adolescents, Casale & colleagues (2015) showed that in KwaZulu-Natal alone, 20% of caregivers caring for adolescents were grandparents, with grandmothers accounting for 90% of all grandparents within the twenty percent. Provincial figures later showed that the province with the highest percentage of double orphans was Eastern Cape (4.8%), followed by KwaZulu-Natal (4.2%), and the province with the lowest percentage of double orphans was Western Cape (0.9%) (Hall & Sambu, 2017).

Households headed by the elderly have been increasing over time in South Africa. A study showed elderly headed households to have increased from 13.59% in 1996 to 14.83% in 2007 (Jhamba & Mmatli, 2015). The increase in grandparenthood is accompanied by more people entering into grandparenting at an early age. A report by Statistics South Africa (2018) showed that in South Africa, females become grandparents at the age of 50 years and for males it is 54 years, and the transition to grandparenthood is not only due to age alone, but complex responsibilities. It has also become evident that although some caregivers may be in older ages, they still care for adults. A qualitative study in Bulawayo, Zimbabwe, showed that among 11 interviewed caregivers who cared for adults, 7 were above 50 years (van den Berg & Pinger, 2016). The just discussed supports and show that most caregivers are aged around 50 years, and it is evidence of complex age-related responsibilities relating to caregiving.

In the year 2010 alone, about 25 million children in the developing world were orphaned by HIV and Aids, as most parent deaths were due to the epidemic (Nsagha et al., 2012). Such orphans have either lost a mother, a father, or both parents, and this is more prevalent in the African continent (Embleton et al., 2014). In South Africa, the role of grandparents being primary caregivers of grandchildren has been due to the historical aspect of labour migration, HIV and Aids, and non-marital childbearing (SAHRC & UNICEF, 2016; Statistics South Africa, 2018a). In their study,

Skinner & colleagues, (2013) cited UNAIDS as it reported that in 2003, an increase of 1.1 million orphans as parents died of HIV and Aids in South Africa. Orphanhood is prevalent in South Africa and noticeable. This brings about the importance of understanding the prevalence and determinants of health outcomes of children, more of double orphans who are in need of serious attention and investigation, giving purpose to this study.

The relationship between the caregiver and the child is also of much importance. From early life, the experience of the relationship between the caregiver and the child is known to have an influence of child's development and well-being as the child grows (Berry & Sambu, 2017). For children living with pensioners, whom are at most times grandparents they depend on, the traditional support structures in Africa and South Africa in particular have created a system that brings about positive benefits for poor children (Ardington & Leibbrandt, 2010; Kahn, 2011). Such traditional support structures are the social and economic support given by grandparents and caregiving itself (Ardington & Leibbrandt, 2010; Mthembu et al., 2016). The social and economic support can be in the form social grants of grandparent caregivers which have been contribution to reduced poverty and positive health among children even post 1997 (Casale et al., 2015; Mayosi et al., 2012; Mtshali, 2015). Using their pension money, grandparent caregivers have been said to buy formula milk, nappies, and also take infants and toddlers to clinics, and emotional support (Knight & Yamin, 2015).

The South African government, together with the department of health, have done much to improve child well-being and child health in South Africa. Regarding the well-being of children, the government has been providing social grants which have proven to have positive outcomes for children (Patel et al., 2017). Even with children accessing social grants, complex issues related to child well-being are still evident and cannot simply be solved by providing social grants alone

(Patel et al., 2017). Although much has been done, in 2016, HIV and aids, tuberculosis, pneumonia, and acute respiratory tract infections still remained underlying causes of death among children aged less than 15 years in South Africa (Dorrington et al., 2018; Statistics South Africa, 2012; United Nations Children's Fund, 2011). With children still suffering from preventable infectious diseases, the number of grandparents who are primary caregivers of children continue to increase in South Africa (Jhamba & Mmatli, 2016; Mabaso et al., 2014). Although much is known on parenting and child health in South Africa, fewer studies have been conducted to understand grandparenthood and the physical health of orphan children raised by grandparents as primary caregiver (Mokgatle & Madiba, 2015; Muller-Kluits & Slabbert, 2018). With the just mentioned, grandparent caregivers play a vital social and economic role in the up-bringing of orphans, bringing a need for better understanding the physical health outcomes of double orphans.

1.2. Problem Statement

Children in South Africa face a number of health challenges. Two of such challenges have been shown to be HIV and Aids and tuberculosis (Mayosi et al., 2012). In 2009, child mortality rate was shown to be 56 deaths per 1000 live births and this was considered high (Mabaso et al., 2014). Literature showed that in South Africa, common causes of child death were lower respiratory infections, diarrhoea, meningitis, HIV and Aids, malnutrition, and poor quality of care by healthcare services (Mabaso et al., 2014; Statistics South Africa, 2012). A report by Dorrington & colleagues, (2018) indicated the most common causes of death among children between 2011 and 2016 to be diarrhoea, pneumonia, and HIV and Aids. The 1998 population policy did mention that HIV and Aids and tuberculosis were among the leading disease in 1994 among the entire

population, and also among children (Department of Social Development, 1998). The case is still the same as Statistics South Africa (2012) reported that tuberculosis was the leading cause of death with HIV and Aids being the sixth between 2014 to 2016. Among children aged 1 to 14 years, tuberculosis and HIV and Aids were just below the top 10 leading underlying causes of deaths in 2016 (Statistics South Africa, 2018b). From the above mentioned literature, it has been clearly illustrated that pneumonia, tuberculosis, and HIV and Aids are fairly common causes of death among children and still remain a problem in need of investigation (Dorrington et al., 2018). With all these taking place, it was noted that 32-54% of deaths were preventable (Mabaso et al., 2014).

Orphans in particular are vulnerable to disease because they lack care of biological parents, adequate socio-economic resources, and caregiver resources (Mhaka-Mutepfa et al., 2014; Schenk et al., 2010). A study did show that compared to orphans, most non-orphans were brought to health facilities by their mothers (Mokgatle & Madiba, 2015). Bringing to attention that the presence of a mother exposes non-orphans to receiving better medical attention compared to orphan children. With such differences in place, a study did argue the need for children at high risk of poor health to be identified (Cluver et al., 2013). Grandparents who are primary caregivers of children are limited in their ability to provide consistent healthcare as they have their own health needs to worry about. Some grandparents have to deal with their daily battles with chronic diseases such as cancer and HIV and Aids (Lombard & Kruger, 2009). The health of grandparents themselves may be poor due to aging, resulting in failure to raise enough social and material resources that contribute positively to the growth and development, and the health of grandchildren (Aransiola et al., 2017).

Much research work has been done on changing household structures, grandparenthood, difficulties in grandfamilies, grandparenting, and orphanhood (Adams et al., 2015; Aransiola et al., 2017; Chambers et al., 2017; Statistics South Africa, 2018a). Literature has focused on the

psychosocial support, social well-being, and educational attainment of orphans (Mokgatle & Madiba, 2015). Although much is known about grandparenthood and grandparenting, little is known on how the involvement of grandparents contribute to the mental and physical health outcomes of grandchildren (Pulgaron et al., 2016). To the knowledge of the researcher, there is no current literature that speaks directly on the physical health outcomes of double orphans raised in grandfamilies in South Africa.

1.3. Justification

Levels of orphanhood are expected to increase in South Africa. It is argued that being an orphan on its own makes orphan children a vulnerable group as they lack parental and caregiver resources (Schmid, 2012). Compared to Sub-Sahara Africa as a whole, South Africa is expected to have a higher increase of orphans, giving much needed interest in focusing on orphans as a vulnerable group (Ardington & Leibbrandt, 2010; Hall & Posel, 2012). Ardington & Leibbrandt (2010) further argued that there is inadequate research on orphanhood that is representative at a national level. Grandparents are increasingly becoming reliant care takers of orphans in South Africa (Ardington & Leibbrandt, 2010; Hall & Posel, 2012). Grandparents are the very same group that is faced with aging and broad chronic diseases (Aro et al., 2018). And for grandparent caregivers, more of older women who are chronically ill, there is greater strain on them as they have long term responsibility regarding taking care of orphans (Kahn, 2011). Grandparent caregivers have complained about the burden of caring for grandchildren as it has impact on the health of grandparents, making it questionable if they are fully capable of being primary caregivers of double orphans (Carretero et al., 2009; Kidman & Heymann, 2016; Muller-Kluits & Slabbert, 2018) Therefore, with increasing dependency on grandparent as primary caregivers, investigations focusing on the health of double orphans raised in grandfamilies becomes important.

There has been progress made to reduce the prevalence of HIV among children in South Africa, but other diseases causing child morbidity and mortality need to be explored in order to further reduce the existing prevalence of morbidity and mortality among children (Wyk et al., 2016). One of such diseases is pneumonia which account for about 17% of under-five child mortality (Dorrington et al., 2018; Sanders & Reynolds, 2017). The interlink between HIV and Aids and tuberculosis is more important as the government has also increased the budget as to prevent mother-to-child transmission of HIV and Aids (Mayosi et al., 2012; Sanders & Reynolds, 2017). Looking at access to health care, Mabaso and colleagues (2014) argued that children in South Africa face challenges of accessing timely and high-quality healthcare. Such challenges are as a result of having poor families, which later increases their risk of illness (Hall & Posel, 2012; Mabaso et al., 2014). With regards to orphans in South Africa, there is growing literature associating mental health of orphans to their orphan status, malnutrition, and poverty (Aransiola et al., 2017). Children and youth are key to the country's future development and this relies on improved health status and survival rates. Therefore, giving importance to focusing on double orphans infected by both HIV and Aids and tuberculosis, together with other leading diseases such as pneumonia.

The National Development Plan has also seen a need to invest in children through an approach of sustainable and rights-based development (Department of Social Development, 2018). This is achievable through set goals which recognize the need to eradicate poverty and do away with inequality by means of providing services that prevent the transmission of poverty from one generation to the other (Department of Social Development, 2018; Hall & Posel, 2012). To achieve its goal, The National Development Plan has set priorities. Priority 6 is aimed at improving human resources in the health sector. By investing in community-based health care, the National

Development Plan aims to re-engineer primary health care by emphasising population based health and health outcomes (National Planning Commission, 2012). The National Development Plan notes that community health care workers have been involved in interventions that target child health and they have been treating common, acute, pneumonia, and childhood illnesses (National Planning Commission, 2012). With this study focusing on double orphans, this vulnerable group will be identifiable and the priorities of the National Development Plan will be informed in a way that may makes the priorities to be target based on the most vulnerable.

A specific policy that also needs to be directly informed is the National Integrated Early Childhood Development Policy of 2015. The policy has a goal to provide services that improve the mental and physical health, and to promote children's health and prevent disease through the provision of quality and effective management of childhood illness, HIV testing and treatment, immunisation, and vitamin until their first year of schooling (Republic of South Africa, 2015). The study will be able to use its results to show the current health status of double orphans and which of their socio-economic characteristics influences their health and may need to be focused on. Given the National Integrated Early Childhood Development Policy specifies that children should be reached at community and household level, this study identifies the health of double orphans in households headed by grandparents (Republic of South Africa, 2015; Sanders & Reynolds, 2017). With that in place, the focus of the National Integrated Early Childhood Development Policy regarding children at household level, will be informed on how the health of double orphans in grandfamilies is a priority in South Africa.

Grandparents play important roles within families as primary and secondary caregivers. However, without such research highlighting factors associated with poor health outcomes among orphans cared for by grandparents specifically, interventions and programmes cannot be improved to meet

the specific needs of this population. The gaps in literature have created a window of opportunity for this paper to examine the levels and socio-demographic characteristics associated with disease outcomes among double orphans (0-14 years) raised in grandfamilies in South Africa in the year 2017.

1.4. Research Question and Sub- Questions

1.4.1. Main research question

1. What are the levels and socio-demographic characteristics associated with disease outcomes among double orphans (0-14 years) raised in grandfamilies in South Africa, 2017?

1.4.2. Sub-questions

1. What is the distribution of the health and socio-demographic characteristics of primary caregivers and double orphans raised in grandfamilies in South Africa, 2017?

2. What are the levels of disease by health and socio-demographic characteristics of double orphans raised in grandfamilies in South Africa, 2017?

3. What are the health and socio-demographic factors associated with diseases among double orphans raised in grandfamilies in South Africa, 2017?

1.5. Research Objective and Sub-Objectives

1.5.1 Main objective

1. To examine the levels and socio-demographic characteristics associated with disease outcomes among double orphans (0-14 years) raised in grandfamilies in South Africa, 2017.

1.5.2. Sub-objectives

1. To examine the distribution of the health and socio-demographic characteristics of primary caregivers and double orphans raised in grandfamilies in South Africa, 2017.

2. To examine the levels of disease by health and socio-demographic characteristics of double orphans raised in grandfamilies in South Africa, 2017.

3. To determine health and socio-demographic factors associated with diseases among double orphans raised in grandfamilies in South Africa, 2017.

CHAPTER 2: LITERATURE REVIEW

2.1. Caregiver demographic and socio-economic characteristics.

In Africa, caregiving is more female oriented. With South Africa being one of many African countries highly affected by the HIV and Aids epidemic, females of older ages have become financial providers in societies affected by epidemic (Lombard & Kruger, 2009). There are usually more female than male caregivers, and there exists a traditional gender norm for women to be caregivers (Aransiola et al., 2017; Berry & Sambu, 2017; Won, 2009). In their study, Thielman & colleagues (2012) indicated that caregivers enrol into the role of being a caregiver at the mean age of 42.9 years, with 87% being females, and only 25% being married. The presented mean age relates to declining age-into grandparenthood. From a study conducted in Mpumalanga, with a sample of 406 primary caregivers of HIV positive orphans and non-orphans, females accounted for 98%, with a mean age of 44.2 years (Mokgatle & Madiba, 2015). From existing studies, the importance of sex and age are seen as most primary caregivers are of older ages and female.

Looking at population group and household structures with children and grandparents, differences are always visible. Dating back to 1998, three generation households in South Africa consisted of about 60% of households headed by black African pensioner, and a lower 9% of households were headed by white pensioners (Lombard & Kruger, 2009). Furthermore, in the same year, pensioner households headed by whites had no young children, while black African pensioner households accounted 14% of skip generation with only grandparents and young children (Lombard & Kruger, 2009).

With regards to education, primary caregivers of orphans and vulnerable children in Zambia, Swaziland, and Namibia (36.9%, 53.5% and 58.6% respectively) had secondary or post-secondary

education (Kanamori et al., 2015). With regards to their employment status, those who were unemployed accounted for 32% in Zambia, 42.8% in Namibia, and 46.6% in Swaziland (Kanamori et al., 2015). In South Africa, Mokgatle and Madiba (2015) showed that caregivers of orphans, whom 13.1% were already pensioners, 17% completed secondary education, and 69% were not employed. It can be seen with literature that most primary caregivers have at least education higher than primary.

2.2. Non-orphan and orphan socio-demographic characteristics.

There is a high number of orphans in Africa. In Sub-Saharan Africa, there are an estimated 55 million children who are single or double orphans (Casale et al., 2015; Embleton et al., 2014; Muller-Kluits & Slabbert, 2018). In 2018, the population of children below 18 years was reported to be 19.7 million, and 3.4 million were orphans in South Africa (Hall & Posel, 2012; Hall & Sambu, 2015; SAHRC & UNICEF, 2016). There are known differences between non-orphans and different types of orphans by country to county (Casale et al., 2015; Muller-Kluits & Slabbert, 2018). A study in Western Kenya showed that in Uasin Gishu, among 300 enumerated households, 63.2% of children were single orphans, with 22.1% being double orphans (Embleton et al., 2014). In 2010,

Most orphans and non-orphans do not differ by sex. A study by Thielman et al (2012) showed that among a sample of 1 305 children, 50% were males and 50% were females. Among the participating children, 10% were non-orphans, 16% maternal, 57% paternal, and 17% were double orphans (Thielman et al., 2012). The study further showed that 55% of children had a biological caregiver, 22% were cared for by grandparents, and 23% by others (Thielman et al., 2012). It is also known that some orphans are cared for by other people, meaning the number of orphans staying with grandparents alone may differ among societies. Literature did indicate that with

increasing number of orphans, it relies on extended family and non-related members to look after or take care of them (Embleton et al., 2014).

In two provinces, out of 18 238 enumerated household (5 254 for Free State, Kopanong and 12 984 for North West, Kanana), among all children, there were more females compared to males (51.5 and 48.5 respectively) (Skinner et al., 2013). The study further showed that by sex there were no differences with regards to maternal, paternal, and double orphans. Although the results were not statistically significant, more than 92% of non-orphans and orphans (with no major differences) were attending school (Skinner et al., 2013). From another study by Mokgatle and colleague (2015), with a sample of 406 children, 41.5% were maternal, 31.5% paternal, and 39.9% were double orphans in rural Mpumalanga, South Africa. The study did indicate no differences with regards to the sex of children, even when analysed by their orphanhood status. One important element to be recognized is the high percentage of children cared for by grandparents, whom also need to be cared for due to old age. In three countries alone, Ghana, Sierra Leone and Liberia, more than 50% of children in grandfamilies were of younger ages, and that may suggest support such as early childhood services which may be in need to put less pressure on grandparent caregivers (Aransiola et al., 2017). Due

2.2. Non-orphan and orphan health.

Poor health among orphans is not only found in African countries. A study in America showed that among its sample of 102 353 participants, compared to other family structures, children in grandfamilies had a lower estimated 76.9% of overall health (Bramlett & Blumberg, 2007). In Asian and African countries, Cambodia, Ethiopia, India, Kenya, and Tanzania, a study showed that with regards to general health, 77% of participating children had good health, 19% had fair, 23% had persistent fair or poor health, and 4% had very poor (Thielman et al., 2012). Literature

has also indicated that children in grandfamilies were twice as much more likely to have special health care needs, asthma related health problems, and twice as more likely to have mental health problems compared to children in nuclear families (Bramlett & Blumberg, 2007). Further, an orphan cared for by a non-parent caregiver had a 1.62 greater likelihood of having disease symptoms in the past 2 weeks as showed by Thielman and colleagues (2012). With regards to illness in the past 6 months, an orphan had a 1.04 greater likelihood of experiencing illness (Thielman et al., 2012). The results were statistically significant, and present how caregiver status directly or indirectly impact the health of orphans.

The human immunodeficiency virus (HIV) and Aids epidemic also played a major role regarding orphanhood in South Africa. Using cross-sectional primary data collected in 34 primary healthcare facilities and two community hospitals in Nkangala, located in the Mpumalanga province, Mokgatle and Madiba (2015) showed that among HIV positive children, only 49.9% of non-orphans had one infection, while 47.3% of orphans had a combination of 2 infections.

2.3. Non-orphan and orphan access to health care services.

Just as literature has shown, the health of a child relies not on the caregiver alone but access to services, and in order for a child to access services an identity document is required. In the North West province, Skinner and colleagues (2013) indicated that 22% and 8% of orphans had no birth certificates in Kopanong and Kanana respectively. The lack of having birth certificates among orphans brought about difficulties accessing services, and the opposite was the case for children with both parents. Access to health care is made possible by identity document, failure to have such documents results in obvious difficulties of receiving services, which is a concern.

Regarding access to medical care in Kanana and Kopanong, 71.8% of all non-orphans received it, and out of all double orphans, only 65.4% had access to medical care (Skinner et al., 2013). The study further showed that double orphans are more subjective to poor living conditions (Skinner et al., 2013).. Research by Bramlett & Blumberg (2007) discussed that children in grandfamilies are less likely to have health insurance as compared to children in other family structured having a biological parent that is present.

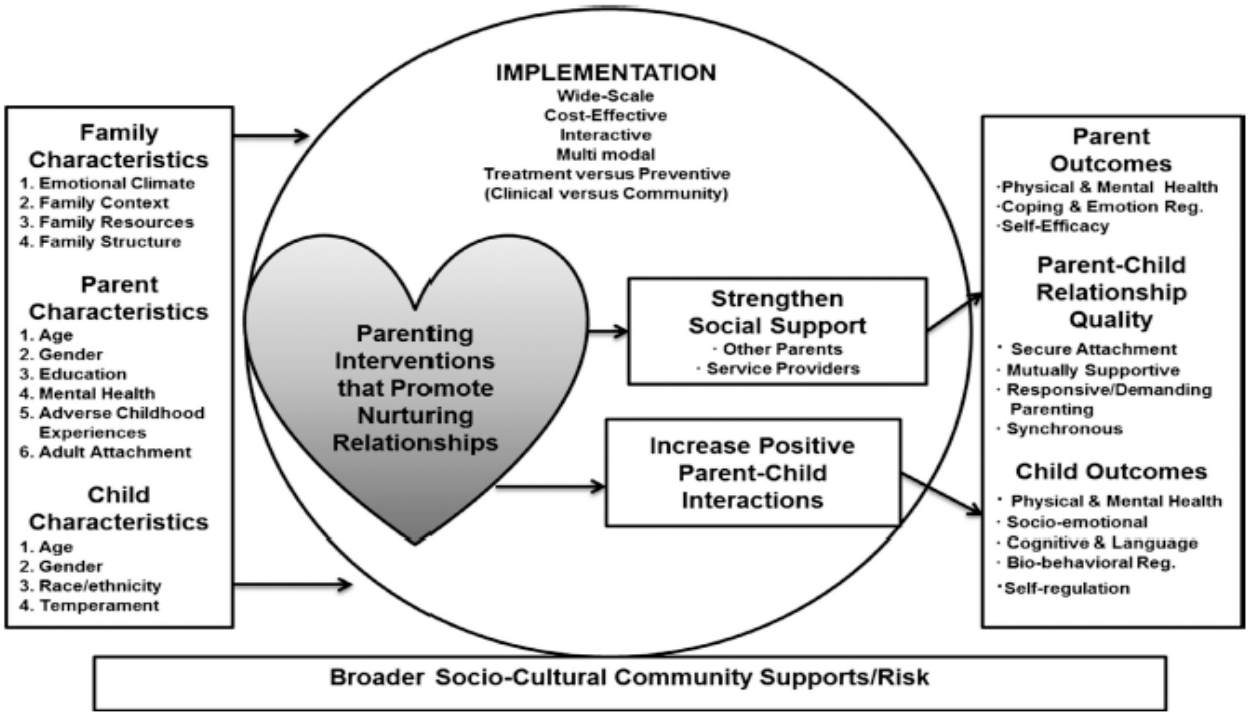
With regards to HIV status among orphans and non-orphans, findings showed orphans were diagnosed late and received antiretroviral viral treatment much later than non-orphans (Mokgatle & Madiba, 2015). Their logistic regression showed maternal orphans to be more likely to be older, tested late, and start antiretroviral viral treatment (2.57, 2.48, and 2.5 times respectively), but only being older was statistically significant (Mokgatle & Madiba, 2015). Maternal orphans started with antiretroviral viral treatment at the median age of 6.3 years and non- orphans at the mean age of 5.0 years (Mokgatle & Madiba, 2015).

2.3. THEORETICAL AND CONCEPTUAL FRAMEWORK

2.3.1. Theoretical Framework

The paper adopted the Building Early Relationships Model of Change by Morris & colleagues (2017). The model incorporates how the characteristics of the family as a whole, of the parent, and that of the child equally influence the implementation of intervention and subsequent outcomes. The model is further set in a broader sociocultural context. It looks into mental and physical outcomes. It proposes that "programs that promote supportive and nurturing relationships between caregivers and other adults, and between caregivers and children, influence both parents' and children's outcomes (e.g., physical and mental health) through two primary mechanisms: (a) strengthening parents' social support and (b) increasing positive parent–child interactions." (Morris et al., 2017). Figure 1 below shows a visual diagram of the theory.

FIGURE 1: BUILDING EARLY RELATIONSHIPS MODEL OF CHANGE.



Source: Morris et al. (2017)

From the model expressed by figure 1 above, the characteristics of the family, those of parents, and those of children, feed into a broader complex relationship of implementation, parenting interventions, strengthened social support, and increased positive parent-child interactions. Strengthened social support and increased positive parent-child interactions directly feed into parent outcomes, parent-child relationship quality, and child outcomes. The model is based more on children's reliance on the care of the parent and how their interaction influence health outcomes. The socio-demographic characteristic of parents and children and the relationship to strengthened social support (representing other parents) are well incorporated and represented by the model. Because of that, the study was interested at the characteristics of children and those of caregivers, which are well presented by the model. Given the much-known relationships between children and caregivers, the study was interested in double orphans that are raised in grandfamilies, making the model fit enough to be applied. The study looked into double orphans who are primarily cared for by grandparents, whom are also a possible vulnerable population depending on parental resources. With regards to child and parent characteristics, the paper adopted elements of the demographic characteristics, socio-economic status, and health status. The demographic characteristics, health status, and socio-economic status of grandparents were used as representatives of the household structures that double orphans are raised in. With regards to strengthen social support, the study adopted other parent, which represented the grandparent caregiver in the study. This was done to put more focus on the relationship of the double orphans to the grandparent, in order to examine if the relationship itself and being cared for by a grandparent caregiver does show disease outcomes that are different from what literature has shown in South Africa.

FIGURE 2: CONCEPTUAL FRAMEWORK OF CAREGIVER CHARACTERISTICS, CHILD CHARACTERISTICS, AND CHILD HEALTH OUTCOME IN SOUTH AFRICA, 2017.

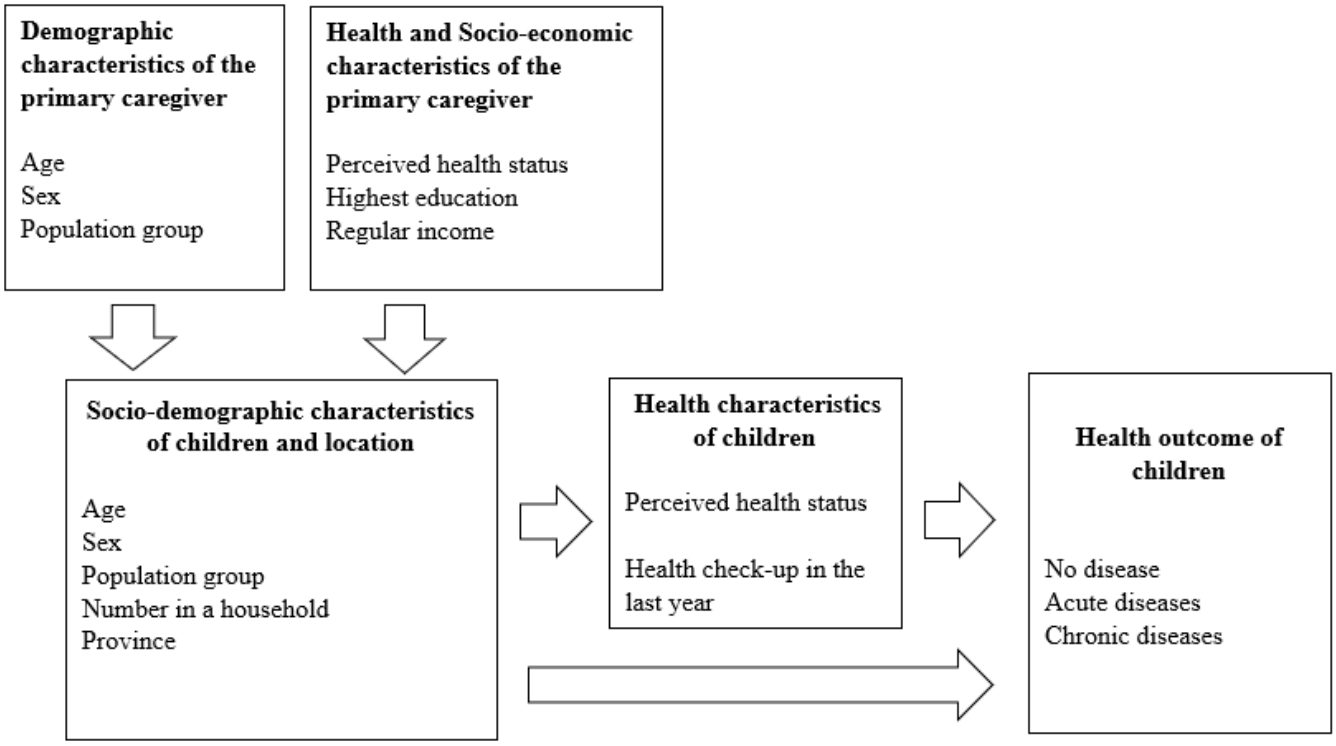


Figure 2 above was influenced and constructed from the original model which is ‘’Building Early Relationships Model of Change’’ by Morris & colleagues (2017). The paper adopted the parent (caregiver) and child (orphan) characteristics. The figure shows the complex relationship between the characteristics of grandparent caregivers (representing the make-up of the household) and those of orphans (children in the household), their relation with health behaviour, and how they collectively influence the health outcomes of double orphans. According to figure 2, the demographic characteristics, health characteristics, and socio-economic characteristics of grandparent caregivers feed into the demographic characteristics of double orphans. This is not to say that the characteristics of the caregiver determines that of children in the household. It was only to show that the characteristics of children may differ according to the make-up of the household. Through the demographic characteristics of children in the household, the health and

socio-demographic characteristics of caregivers influences the health behaviour and access to healthcare among double orphans.

Giving attention to the demographic characteristics of orphans, they directly influence their health behaviour and access to healthcare. The demographic characteristics of orphans, their health behaviour, and access to healthcare directly determine their health (disease) outcome. For the health outcome of double orphans, the study adopted only physical health under child outcomes, which the study measured by no disease, acute diseases, and chronic diseases.

CHAPTER 3: Methodology

3.1. Introduction

This chapter presented the description of the study area, the methodology, which consist of the data source and the methods used to arrive at the final results. With regards to the methods used, this chapter provided detailed data source, data collection procedures, sampling design technique, sample size, variable definitions, data analysis procedures, and the limitations.

3.2. Description of the study area

FIGURE 3: A MAP OF SOUTH AFRICA WITH PROVINCIAL NAMES.



Figure 3 above shows the South African map with provincial names. With a midyear population of 59.6 million in 2020, the country is made up of nine provinces that differ in population size and land size (Statistics South Africa, 2020). The Gauteng province is the smallest regarding land size

but the largest regarding population size, and while the Northern Cape has the biggest land area, it has the smallest population size (Statistics South Africa, 2019, 2020). Majority of the population group is Black African (80.8%) followed by the Coloured population (8.8%), White population (7.8%), and the smallest population group is the Indian/Asian population group accounting for 2.6% (Statistics South Africa, 2020). Regarding age distribution, more than 60% is aged between 15-59 years, while those aged 0-14% represent 28.6% of the population, and only 9.1% of the population is aged 60 years and above (Statistics South Africa, 2020). Given South Africa has a rich demographic profile, this study saw South Africa as an interesting country (area) to study.

3.3. Data source

The study was quantitative in nature and used secondary cross-sectional data. The study used the National Income Dynamics Study (NIDS) 2017. The data is from a nationally representative household panel study that started in 2008, which is the first of its kind in South Africa (Branson, 2019). The same households are surveyed every two years and form 5 different waves to date, collected from 2008 to 2017 (wave 1 to 5). The National Income Dynamics Study (NIDS) data is representative of the entire South African population. The data was first collected from a sample of 7 296 responding households in 2008, and later the households were increased with an additional 1008 households in the year 2017 (Branson & Wittenberg, 2019). Data collection was done by the Southern Africa Labour and Development Research Unit (SALDRU) based at the University of Cape Town's School of Economics (Brophy et al., 2018). The data is available on DataFirst for registered users. Datafirst is a research data service (open data portal) that provides access to quality data to South Africa and other countries.

3.4. Study design

The National Income Dynamics Study (NIDS) data was collected using a two-stage cluster sampling approach. This is the type of sampling where a random sample of cluster is selected and a simple random sample is selected from the units in each sample cluster. The sampling was done at the district level and the sample was restricted to boundaries informed by the census 2011 boundaries (Branson & Wittenberg, 2019).

From the data, the study was mainly interested in the year 2017 (wave 5), and not the previous years, hence only one wave (wave 5) was used to explore the data in a cross-sectional design. The study was not interested in analysing the data longitudinally as the interest was not trends (incidence) but only interested in a specific year 2017 (prevalence). There are only a few studies which have investigated orphan health using current data in the past years, and because of that, this study saw it important to use the latest available data (wave 5) to understand the health outcomes of double orphans raised in grandfamilies in South Africa.

The study predominantly used the child and adult files, but for the purpose of having a representative survey set and survey weight, more files were merged. The study merged the child file with the adult, the household, and the link file. From the child file, the health, demographic, and geographical variables, together with the variable which identifies the primary caregiver of the child, were of interest. From the adult file, the health and socio-demographic variables of the adult, whom is the primary caregiver, were of interest. The household and link files were only used for the primary sampling unit, cluster, and to link the different files during merging.

The cross-sectional weight used included the population samples of waves 1 to 4, and the wave 5 top-up sample. In the NIDS user manual, it was explained how the weights were calculated. For the weights to be representative of the South African population, they were calculated using the

appropriate mid-year population estimates from Statistics South Africa. The weight which was used for all the frequency distributions and cross tabulations was the individual weight applicable to wave five, which already included the top-up sample. Furthermore, the use of weights was to account for low numbers (sample) contained in the data. The weight is expressed as; individual weight is equal to wave 5, including the top-up sample [iw=w5_dwgt].

The survey set was generated by using a STATA command; svyset cluster [pw=w5_wgt], strata (w5_dc2001). The survey set was used for regression analysis to allow for appropriate standard errors, confidence intervals, and to get representative results, as also indicated that NIDS has a complex survey design, that is a two stage cluster sampling (Branson & Wittenberg, 2019; Timothy Brophy et al., 2018).

3.5. Study population and sample size

Literature argued that most grandparents, more in Sub-Saharan Africa, and South Africa to be specific, become caregivers at ages 40-50 years (Mokgatle & Madiba, 2015; Statistics South Africa, 2018a; Thielman et al., 2012). With Statistics South Africa (2018a) showing age at grandparenthood to be 50 for females and 54 for males, the study therefore considered focusing on caregivers of age 40 and above. To determine age, the variables date of interview and date of birth were used. The date of birth was subtracted from the year of interview.

The study only focused on grandparent caregivers aged 40 years and older and double orphans below the age of 15 years that are raised by grandparent caregivers. The study started by first creating a variable that identified grandparent caregivers. To get grandparent caregivers, the variables (1) biological mother alive and (2) biological mother deceased, (3) biological father alive

and (4) biological father deceased, and (5) relationship code of person responsible for care of child were used. Grandparent caregivers were grandparent and great-grandparent who indicated to be primarily responsible for the care of children who indicated both parents to be deceased. Other relations to the child besides the grandparent and great-grandparent were excluded. Grandparent caregivers accounted for 149 160.

To determine double orphans, the same variables (1) biological mother alive and (2) biological mother deceased, (3) biological father alive and (4) biological father deceased, and (5) relationship code of person responsible for care of the child were used. Double orphans are children who indicated both parents to be deceased and are primarily cared for by grandparents and great-grandparents. After filtering age and excluding children aged 15 and older, double orphans accounted for 466 210.

3.6. Questionnaire Design

The study used secondary data. As stated earlier, Southern Africa Labour and Development Research Unit (SALDRU) was responsible for creating the questionnaire and this study did not in any way make use of the NIDS questionnaire or any questionnaire for that matter. In place of an own questionnaire, the study used the already available questionnaire and metadata as means of understanding the questions that were asked on each variable.

3.7. Study variables

3.7.1. Dependent variable

From table 1 below, the categorisation of the outcome variable is shown. The outcome of interest is health (disease) outcomes of double orphans raised in grandfamilies in South Africa, 2017. The

outcome was created using three health measures which were collected by asking if the child has/had any illnesses or disabilities (w5_c_hlser), if the child was ill for at least 3 days in the last month (w5_c_hlill30), and what was the main serious illness or disability of the child (w5_c_hl1). The outcome variable has three categories which are (0) no disease, (1) acute diseases, and (2) chronic diseases. During data collection, the questionnaire did not ask specific question on which disease was the child suffering from when he or she was sick for at least 3 days in the last month. This is one of the limitations listed in the limitations. The category no disease (0) was derived by selecting those who indicated to have no disease or disability, and those whose who never fell ill for at least 3 days in the last month. The acute diseases category (1) was derived by including those who fell sick for at least 3 days in the last month and had no chronic disease. As stated earlier, the disease(s) the chilled suffered from in the 30 days was not indicated by the questionnaire or data. The category chronic diseases (2) was created using responses of those who indicated their main serious illness or disability to be HIV and Aids, TB, and other respiratory diseases (asthma, bronchitis, and pneumonia), excluding those who fell ill for at least 3 days in the last month. The inclusion and interest in pneumonia, HIV, and TB in the chronic diseases category was because they are among the leading causes of death in South Africa (Dorrington et al., 2018; Statistics South Africa, 2012; Wyk et al., 2016)

TABLE 1: CATEGORIZATION OF THE OUTCOME VARIABLE AMONG DOUBLE ORPHANS IN SOUTH AFRICA, 2017.

Original variable name	**New variable name and codes**
W5_c_hlser (The child has/had any illness or disabilities?) w5_c_hlill30 (The child has ill for at least 3 days in the last month) w5_c_hl1 (What is the main serious illness or disability?)	**Health (disease) outcome** No disease= 0 Acute diseases=1 Chronic diseases=2

Source: calculated from NIDS 2017 data.

3.7.2. Control variables:

Table 2 below shows how the study categorised the control variables. The study had seven control variables which consisted of health variables, demographic variables, a household variable, and a geographical variable as illustrated in table 2 below. The first two control variables were health related. The first control variable was perceived health status, and the second was health check-up in the last year. For the variable perceived health status, the questionnaire asked "Overall, how is this child's health at this point in time?" For the variable health check-up in the last year, the questionnaire asked the question "How often in the past 12 months has the child been to the doctor, clinic or hospital for a routine check-up when he/she was not ill?" Perceived health status also had three categories which are (1) Above good, (2) good, and (3) below good. For this study, health check-up in the last year had three categories that are (1) once, (2) more than once, and (3) never. The first two control variables were fit for the study as they were more related to the health of the individuals, whom are double orphans in this context.

The first demographic variable was age which was achieved by subtracting the date of birth of the child from the date of the survey which was 2017. The age variable consisted of double orphans aged 0 to 14. Age was grouped into 5 year age groups 0-4, 5-9, and 10-14. With the second demographic variable being sex, the questionnaire asked what was the child's gender? The study kept the original coding of sex as males=1 and females=2. The third demographic variable was population group. The questionnaire asked what population group does the child belong to? with four known population groups which are (1) African, (2) Coloured, (3) Asian/Indian, and (4) White. Given that the majority of the South African population is Black African (Statistics South

Africa, 2019), the study did notice that the sample of Coloureds, Asian/Indian, and Whites was low and grouped population group into Black African (1) and Non-Black African (2).

For the fourth control variable, a household variable "Number of household residents" was used. The household variable was just the number of children in a household. The study used this variable to determine how many double orphans are in each household. The variable was continuous in nature (0 to 30). The study coded it into four categories which were (1) one, (2) two, (3) three, and (4) four and more. The firth control variable was a geographical variable province, which the questionnaire obtained by taking record of where the child was enumerated. The study used the variable to show differences by provinces in South Africa as the country has nine provinces which are not equal with regards to the distribution of population and resources. The variable was treated with is original coding which was (1) Western Cape, (2) Eastern Cape, (3) Northern Cape, (4) Free State, (5) KwaZulu-Natal, (6) North West, (7) Gauteng, (8) Mpumalanga, (9) Limpopo.

TABLE 2: CATEGORIZATION OF THE CONTROL VARIABLES AMONG DOUBLE ORPHANS IN SOUTH AFRICA, 2017.

Original variable name	New variable name and codes
Hldes (Overall, how is this child's health at this point in time?)	Perceived health status Above good=1 Good=2 Below good=3
(hlchckup) How often in the past 12 months has this child been to the doctor, clinic or hospital for a routine check-up when he/she was not ill?	Health check-up in the last year Once=1 More than once=2 Never=3
w5_c_intrv_y (Date of interview)	Age

Original variable name	New variable name and codes
w5_c_dob_y (What was the child's date of birth?)	0-4 5-9 10-14
Gen (What is the child's gender?)	Sex Male=1 Female=2
Popgrp (What population groups does this child belong to?)	Population group Black African=1 Non-Black African=2
Number of household residents (w5_hhsizer)	Number in a household One=1 Two =2 Three=3 Four and more=4
Province (Province 2011)	Province Western Cape=1 Eastern Cape=2 Northern Cape=3 Free State=4 KwaZulu-Natal=5 North West=6 Gauteng=7 Mpumalanga=8 Limpopo=9

Source: calculated from NIDS 2017 data.

3.8. Hypothesis

H0 – There is low disease prevalence among double orphans raised by grandparents.

H1 – There is high disease prevalence among double orphans raised by grandparents.

H0 – There is no association between the health and socio-demographic characteristics and the disease outcomes of double orphans raised by grandparents.

H1 – There is an association between the health and socio-demographic characteristics and the disease outcomes of double orphans raised by grandparents.

3.9. Ethical issues

Noting that the study was quantitative and used secondary data, no ethical approval was needed from Southern Africa Labour and Development Research Unit, but the study did assure that its results were not to cause any harm or conflict. The data is readily available on the public domain (DataFirst) and was not in any way used to identify or harm respondents, and was only used for the sole purpose of research. The usage of the data is governed by terms and conditions which include that the data not to be shared, sold, used to re-identify individuals, and to produce links among datasets provided by DataFirst (Brophy et al., 2018). With the just mentioned, the study adhered to the terms and conditions of DataFirst while utilizing the data set. An ethics waiver from the University of the Witwatersrand was also submitted to the faculty with the number WDEMG2019/07/13.

3.10. Data Analysis

STATA version 14 was used to run and clean the data. The analysis was done with the aid of STATA version 14 and Excel 2016. Frequency, cross tabulations, and regression were done with STATA. For the frequency, cross tabulations, and regression results, excel was used to create tables and graphs. Health and socio-demographic characteristics of grandparent caregivers double

orphans were shown with the use of a frequency table and the prevalence of health outcomes (disease) using a pie chart. The test statistics and regression results were also shown using a table. For the study to be able to address its research questions and reach its objectives, each of the objectives were addressed.

Objective 1: To examine the distribution of the health and socio-demographic characteristics of grandparent caregivers and double orphans in South Africa, 2017.

The health and socio-demographic profiles were achieved by running frequency distribution of the health and socio-demographic of grandparent caregivers and of double orphans. The results were shown using frequency tables with percentages, only age groups of the primary caregiver and the provincial distribution of double orphans were shown using bar graphs.

The dependency ratio is known as an index used to show or summarise an age distribution by indicating the ratio of those depending on the economically active age group in a defined population (Weeks, 2015). The study saw the use of the dependency ratio to be important and calculated the child caregiver dependency ratio which is indicated below.

$$\text{Child caregiver dependency ratio} = \frac{\boldsymbol{Children\ aged\ 0-14}}{\boldsymbol{Caregivers\ aged\ 40-65+}} \times \mathbf{100}$$

The above formula was used to calculate the child caregiver dependency ratio and it was shown using a bar graph in the results chapter.

Objective 2: To examine the levels of disease by health and socio-demographic characteristics of double orphans raised in grandfamilies in South Africa, 2017.

Prevalence is understood as the frequency or proportion of people with a particular attribute or existing cases in a defined population at a certain point in time (Bonita et al., 2006; Kue Young, 2004). To achieve sub-objective 2, the paper used the prevalence equation as to examine and show

the levels of disease (those free of disease, those with short term disease, and those with long term disease) among the entire population of double orphans. The use of prevalence become applicable in the study due to the fact that the data is cross-sectional and just a snapshot of 2017 alone. Prevalence of disease was calculated and shown using the equation:

$$\textbf{Prevalence} = \frac{\textit{Number of people with the disease at a specified time}}{\textit{Number of people in the population at risk at the specified time}} \times \mathbf{100}$$

The numerator represented the number of cases with disease at a given point in time, to be more specific, the year 2017. The denominator was the population at risk of the disease in the same year. Given prevalence is expressed as cases per 100 (percentage), it was multiplied by a factor 100 in this case and interpreted as percentages in the results section. Cases were double orphans with acute diseases and chronic diseases in the year 2017, and the population at risk was all double orphans in the year 2017. The results were shown using a bar graph.

Objective 3: To determine health and socio-demographic factors associated with diseases among double orphans raised in grandfamilies in South Africa, 2017.

The study had one outcome variable that was categorical in nature and not ordered. The outcome was created with responses of children with no disease, those who had acute diseases, and chronic diseases, coded 0, 1, and 2 respectively. To achieve objective 3, Multinomial Logistic regression was used to calculate relative risk ratios as means of measuring the association between characteristics the double orphans and health outcomes of double orphans. Given the outcome was categorical with three categories, this type of regression allows for outcome variables that are categorical with no natural ordering and was fit for the study outcome. The equation used for the multinomial logistics regression is below. From the model, disease outcome (Y) is the dependent variable with possible values of c(0, 1… c-1) and the reference category is Y=0 (category of no

disease). The independent variables are represented by X=(X1,2…Xn). Namely the independent variables are perceived health status, health check-up in the last year, age, sex, population group, number in a household, and province. The probability of eacha category of the dependent variable is expressed by the below formular

$$P(Y = 0|X) = \frac{1}{1 + e\beta 1(x) + \cdots \beta c - 1(x)}$$

$$P(Y = 1|X) = \frac{e\beta 1(x)}{1 + e\beta 1(x) + \cdots \beta c - 1(x)}$$

$$P(Y = c - 1|X) = \frac{e\beta c - 1}{1 + e\beta 1(x) + \cdots \beta c - 1(x)}$$

Regarding the logit function category (j) versus the baseline category, the expression can be as shown below

$$gj(X) = Ln\frac{P(Y=j|X)}{P(Y=0|X)} = \beta JO + \beta j1X1 + \cdots \ldots \beta jPXP \text{ For } j=1,2,\ldots,c\text{-}1$$

Independent observations are represented by (yi)= 1,2….,n, and vector i is a vector of c binary indicator variable yij and πij=p (y=j|xi). Furthermore, to obtain β (parameter estimates), the standard likelihood model is applied. The formula was used to calculate (run using STATA) unadjusted and adjusted models. The results were shown using a table. The analysis was done at an individual level and all non-responses are excluded. The study also set a confidence of 95% at significance level 0,05. The results were shown using unadjusted and adjusted multinomial logistic regression models. The 2 models are shown in two different tables table.

3.11. Model diagnostics

Three model test statistics were run by the study. The first test statistics was run using the correlation matrix to test for multicollinearity. The test for multicollinearity allowed for the level

of collinearity to be examined among the independent variables. The study tested for multicollinearity and the results were shown using a correlation matrix on appendix 1 (table 5). No strong, moderate, or strong correlation was found between the independent variable.

The second test statistics was the Pearsons chi-square measure of association with p-values. The third test statistics calculated was the F test. The F test was included when running the multinomial logistic regression models. The results were shown on the same table that presented the regression results. The F test showed the significance of all the variables in the models. The F test helped in accepting or rejecting the null hypothesis.

3.12. Limitations

With all controls being in place and responses such as refusals, do not know, and missing were dropped, and the data cleaning process resulted in some changes. Population group indicated to have majority of black Africans, and the Coloured, White, and Asian/Indian population groups showed to have very low numbers, which affected the regression by showing results extremely lower than 1 (one). To account for such low numbers, the data was weighted.

The Mpumalanga province showed to have no double orphans with acute and chronic diseases. The regression results regarding the province may not be a true representative of disease outcomes in the province. Hence the regression results of Mpumalanga province were not interpreted.

With regards to the outcome variable, the data set had limited infectious diseases among children, limiting the paper to HIV and Aids, tuberculosis (TB), and other respiratory problems. With regards to other respiratory problems (asthma, bronchitis, and pneumonia), the original category in variable main serious illness or disease, combined asthma, bronchitis, and pneumonia. The study would have liked to separate the three and focus more on pneumonia as it is prevalent among

children. The category acute diseases on the outcome variable limited the paper by not specifying the exact diseases children suffered from for at least 3 days in the last 30 days (month). Hence the paper was not able to single out the more prevalent acute disease children suffered from for at least 3 days in the last month.

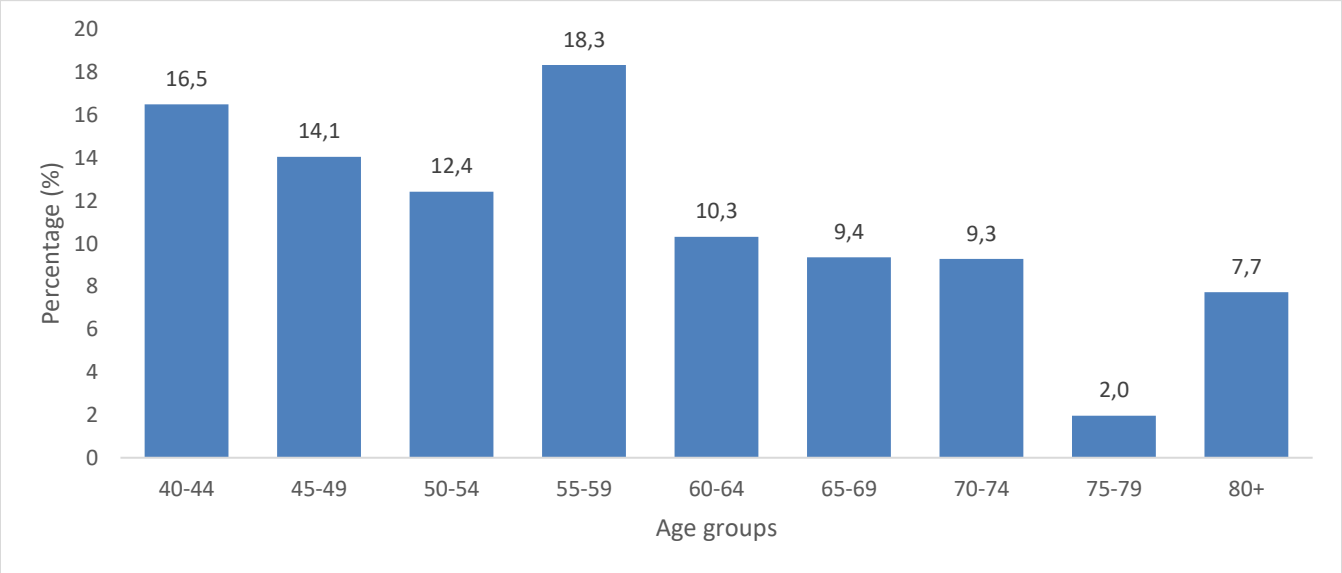
CHAPTER 4: RESULTS

4.1. Introduction

This chapter presented the results of the study. The chapter presented the health and socio-demographic characteristics of grandparent caregivers of double orphans and those of double orphans themselves. The study noted that it is important to understand the characteristics of those taking care of double orphans in South Africa. Understanding characteristics of primary grandparent caregivers of double orphans gave a presentation of the makeup of grandparent households double orphans are raised in. The chapter further showed the prevalence of disease, the health and socio-demographic characteristics of double orphans, the background characteristics by the outcome, and lastly the unadjusted and adjusted multinomial logistic regression results.

4.2. Frequency and percentage distribution of background characteristics of grandparent caregivers of double orphans in South Africa, 2017.

FIGURE 4: AGE *DISTRIBUTION OF GRANDPARENT CAREGIVERS OF DOUBLE ORPHANS* IN SOUTH AFRICA, 2017.



Source: calculated from NIDS 2017 data.

Figure 4 above shows the percentage distribution of grouped age of grandparent caregivers of double orphans in South Africa, 2017. Generally, most caregivers are below the age 60 years. As presented by figure 3, a larger group of grandparent caregivers (18.3%) are aged 55-59 years and the second largest age group is aged 40-44 years (16.5%). More interesting, grandparent caregivers aged 80 years and older (7.7%) are second lowest compared to those aged 75-79 years (2.0%).

Table 3 below presents the background characteristics of grandparent caregivers of double orphans in South Africa, 2017. Regarding perceived health status, 40.69% of grandparent caregivers perceived their health to be good, with 38.10% perceiving it to be above good, and only 21.20% perceived it as below good.

Giving attention to the sex of the grandparent caregiver, majority of grandparent caregivers are female as they account for 69.65% as compared to 30.35% of male grandparent caregivers. Moving to educational level, most grandparent caregivers show to have secondary education (42.78%) while 14.86% have no education. Furthermore, at least 20.41% of grandparent caregivers have post-secondary education. With regards to regular income, majority of grandparent caregivers (68.64%) do not receive any regular income and only 31.36% do receive regular income.

TABLE 3: HEALTH AND SOCIO-DEMOGRAPHIC CHARACTERISTICS OF GRANDPARENT CAREGIVERS OF DOUBLE ORPHANS IN SOUTH AFRICA, 2017.

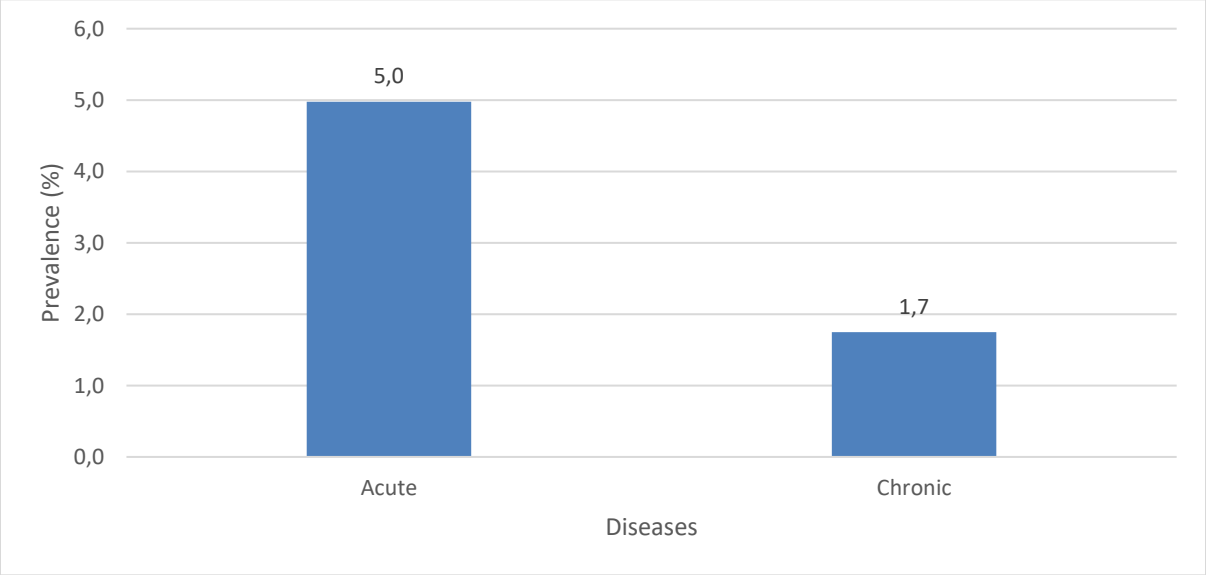
Heal and socio-demographic characteristics	Frequency (n)	Percentage (%)
Sample	149 160	100
Perceived health		
Above good	56 833	38,10
Good	60 700	40,69
Below good	31 627	21,20
Sex		
Male	103 887	30,35
Female	103 887	69,65
Population group		
Black African	100 646	67,48

Heal and socio-demographic characteristics	Frequency (n)	Percentage (%)
Non-Black African	48,514	32,52
Highest education		
No education	22 163	14,86
Primary	32 756	21,96
Secondary	63 805	42,78
Post-secondary	30 437	20,41
Receiving regular income		
No	102 383	68,64
Yes	46 777	31,36

Source: calculated from NIDS 2017 data.

4.3. Frequency distribution of the health outcome and background characteristics of double orphans in South Africa, 2017.

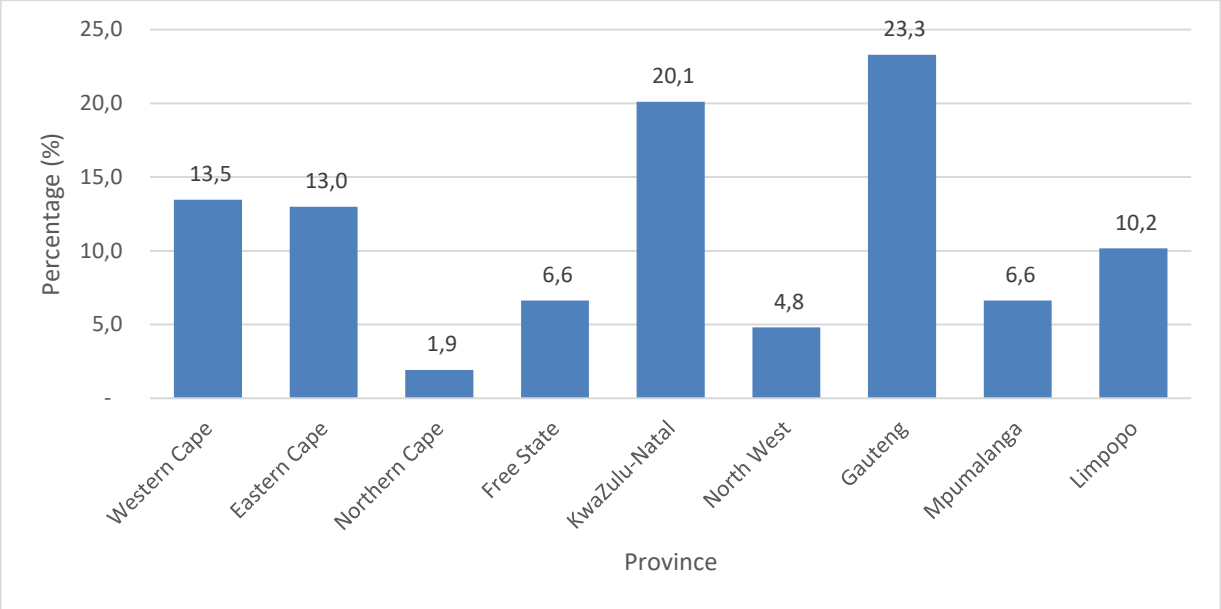
FIGURE 5: DISEASE PREVALENCE AMONG DOUBLE ORPHANS AGED 0-14 YEARS IN SOUTH AFRICA, 2017.



Source: calculated from NIDS 2017 data.

Figure 5 above presents the prevalence of diseases among double orphans aged 0 to 14 years in South Africa. Double orphans show to have a higher prevalence of acute diseases as compared to chronic diseases. To be specific, 5% of double orphans show to have acute diseases while only 2% show to have chronic diseases.

FIGURE 6: PERCENTAGE DISTRIBUTION OF DOUBLE ORPHANS BY PROVINCE IN SOUTH AFRICA, 2017.



Source: calculated from NIDS 2017 data.

Figure 6 above presents the percentage distribution of double orphans by province in South Africa, 2017. Generally, more double orphans are in the Gauteng province and only a few are in the Northern Cape province. The Gauteng province account for 23.3% of double orphans, followed by KwaZulu-Natal (20.1%), and the Western Cape province with 13.5%. With the North West province having the second lowest percentage of double orphans (4.8%), the Northern Cape province showed to have the lowest percentage of double orphans (1.9%).

Table 4 below shows a column distribution of background characteristics of double orphans in South Africa, 2017. With regards to perceived health status, double orphans generally perceived their health to be above good with indications above 80% and only a few perceived their health to be below good with indications below 3%. To be more direct, a high percentage of 86.06% perceived their health to be above good, followed by those who perceived theirs to be good (11.70%), and only 2.23% perceived their health to be below good. Health check-up is important for knowing or confirming one's health status. Focusing on health check-up in the last year, a

larger percentage of double orphans (48.35%) never checked-up in the last year, followed by those who checked-up once (29.69%), and fewer double orphans (21.97%) checked-up more than once.

One other important demographic variable is age. Majority of double orphans are in the older age group of 10-14 years (62.55%) while only 7.07% are in the age group 0-4 years. Regarding sex, there are slightly more female double orphans (52.23%) as compared to male double orphans (47.77%). Population group shows the normal distribution of more black Africans compared to other population groups, which is well known in South Africa (Statistics South Africa, 2019). A high 92.31% of double orphans are Black African and only 7.69% are non-Black African (Coloured, Indian/Asian, and White). Bringing attention to the number of double orphans in a household, a larger percentage of double orphans are four and more in a household (42.18%) and those who are just three account for the lowest at 15.28%. It is clear how grandfamilies have multiple double orphans in South Africa.

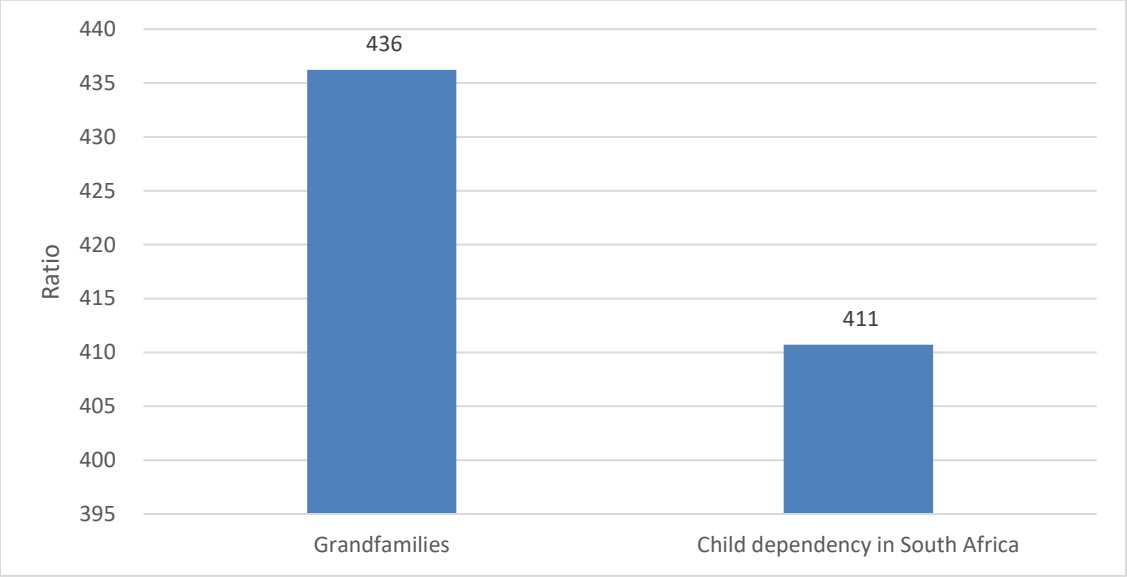
TABLE 4: HEALTH AND SOCIO-DEMOGRAPHIC CHARACTERISTICS OF DOUBLE ORPHANS CARED FOR BY GRANDPARENT CAREGIVERS IN SOUTH AFRICA, 2017.

Heal and socio-demographic characteristics	Frequency	Percentage
Total	466 210	100
Perceived health		
Above good	401 238	86,06
Good	54 563	11,70
Below good	10 410	2,23
Health check-up in the last year		
Once	138 402	29,69
More than once	102 403	21,97
Never	225 405	48,35
Age		
0-4	32 983	7,07
5-9	141 619	30,38
10-14	291 608	62,55
Sex		
Males	222 723	47,77

Heal and socio-demographic characteristics	Frequency	Percentage
Female	243 487	52,23
Population group		
Black African	430 368	92,31
Non-Black African	35 843	7,69
Number in a household		
One	123 629	26,52
Two	74 689	16,02
Three and more	71 231	15,28
Four and more	196 662	42,18

Source: calculated from NIDS 2017 data.

FIGURE 7: CHILD CAREGIVER DEPENDENCY RATIO AMONG GRANDFAMILIES AND OVERALL CHILD CAREGIVER DEPENDENCY IN SOUTH AFRICA, 2017.



Source: calculated from NIDS 2017 data.

From figure 7 above, the child caregiver dependency ratio among grandfamilies and the overall child caregiver dependency ratios are shown. There is high child caregiver dependency among grandfamilies, with 436 double orphans per 100 grandparent caregivers. A difference of 25 between the child caregiver dependency in grandfamilies and the overall child caregiver dependency. On average, there are four double orphans taken care of by a grandparent caregiver.

4.4. Health outcome by background characteristics of double orphans in South Africa, 2017.

Making reference to table 5 below, the health and socio-demographic characteristics of double orphans by their health outcome are shown. It is noticeable that 93.28% of double orphans have no disease, 4.98% have acute diseases and only 1.75% have chronic diseases. Regarding perceived health status, among double orphans who were reported to have health that is above good, 95% have no disease while 4.28% have acute diseases and only 0.72% have chronic diseases. For those that were reported to have health that is below good, 24.10% have acute diseases and 21.67 have chronic diseases. The association was statistically significant with a p-value of 0.00. Looking at health check-up in the last year, 16.17% of double orphans who checked-up more than once have acute diseases and only 1.39% have chronic diseases. What draws attention is that among those who never went for a check-up in the last year, 99.59% indicated to have no disease. Health check-up in the last year by the disease outcome also showed to be statistically significant with a p-value of 0.00.

With regards to the age of double orphans raised in grandfamilies, 9.20% of those in the age group 0-4 years have acute diseases while none showed to have chronic diseases. For those aged 5-9 years, 5.24% have acute diseases as compared to the 3.05% of those with chronic diseases. With focus shifting to the sex of double orphans, 4.13% of males have acute diseases while 2.42% have chronic diseases, and among females, 5.75% have acute diseases while only 1.13% have chronic diseases. With population group categorised into Black African and non-Black African, differences are also visible. Among Black Africans, 5.17% show to have acute diseases and only 1.89% have chronic diseases. Majority of Non-Black Africans show to have no disease while 2.91% have acute diseases.

Still referring to table 6 below, looking at the number of double orphans in a household, where there are two double orphans, 9.98% have acute disease and 1.72% have chronic diseases. Among those three, 7.09% have acute diseases with 0 double orphans having chronic diseases. Regarding province, 7.46% of double orphans in the Eastern Cape prove to have acute diseases while only 2.72% have chronic diseases. In the KwaZulu-Natal province, 88.46% of double orphans have no disease and 9.04% show to have acute diseases. The North West province show 5.16% of double orphans to have acute diseases while 4.98% have chronic diseases.

TABLE 5: PERCENTAGE DISTRIBUTION OF HEALTH AND SOCIO-DEMOGRAPHIC CHARACTERISTICS BY THE HEALTH OUTCOME OF DOUBLE ORPHANS IN SOUTH AFRICA, 2017.

Health and socio-demographic characteristics	No disease		Acute		Chronic		p-value	Pearson's chi2
	n	%	n	%	n	%		
Total	434 864	93,28	23 205	4,98	8 141	1,75		
Perceived health								
Above good	381 183	95,00	17 170	4,28	2 885	0,72	0,000	58,146
Good	48 037	88,04	3 526	6,46	3 000	5,50		
Below good	5 645	54,23	2 509	**24,10**	2 256	**21,67**		
Health check-up in the last year								
Once	114 088	82,43	22 385	**16,17**	1 929	1,39	0,000	58,044
More than once	96 301	94,04	594	0,58	5 508	5,38		
never	224 475	99,59	226	0,10	703	0,31		
Age								
0-4	29 948	90,80	3 035	**9,20**	0	0,00	0,586	3,638
5-9	129 891	91,72	7 415	5,24	4 314	**3,05**		
10-14	275 025	94,31	12 755	4,37	3 828	1,31		
Sex								
Males	208 132	93,45	9 209	4,13	5 382	2,42	0,305	2,874
Females	226 733	93,12	13 995	**5,75**	2 759	1,13		
Population group								
Black African	399 965	92,94	22 262	**5,17**	8 141	1,89	0,4983	1,428
Non-Black African	31 450	97,09	943	2,91	0	0,00		
Number in a household								
One	114 341	92,49	5 475	4,43	3 813	3,08	0,631	6,109
Two	65 952	88,30	7 450	**9,98**	1 287	1,72		
Three	66 185	92,91	5 047	7,09	0	0,00		
Four and more	188 387	95,79	5 233	2,66	3 042	1,55		
Province								
Western Cape	61 046	97,21	767	1,22	985	1,57	0,715	12,052

Health and socio-demographic characteristics	No disease		Acute		Chronic		p-value	Pearson's chi2
	n	%	n	%	n	%		
Eastern Cape	54 379	89,82	4 518	**7,46**	1 647	2,72		
Northern Cape	8 354	93,27	396	4,42	207	2,31		
Free State	30 134	97,58	747	2,42	0	0,00		
KwaZulu-Natal	82 887	88,46	8 467	9,04	2 346	2,50		
North West	20 171	89,86	1 159	**5,16**	1 117	**4,98**		
Gauteng	100 944	93,00	5 763	5,31	1 839	1,69		
Mpumalanga	30 913	**100**	0	0,00	0	0,00		
Limpopo	46 037	97,07	1 389	2,93	0	0,00		

Source: calculated from NIDS 2017 data.

4.5. Multinomial logistics regression

4.5.1. Multinomial logistic regression model of the health and socio-demographic characteristics of double orphans and their health outcomes in South Africa 2017.

Table 6 below shows an unadjusted multinomial logistic regression. The results showed that perceived health status and health check-up in the last year significant predictors of disease outcomes among double orphans raised in grandfamilies in South Africa with p-values less than 0.05. Referring to reported perceived health status, the relative risk of having acute diseases verses having no diseases decreased by a factor 0.072 for double orphans reported to have good health relative to those reported to have above good health [CI 0.010-0.513]. The relative risk of having acute diseases verses having no diseases decreased by a factor 0.092 for the health status of double orphans perceived to be below good relative to health status perceived to be above good [CI 0.012-0.720].

Furthermore, the relative risk of having chronic diseases verses having no diseases decreases by a factor 0.093 for health perceived as below good relative to above good [CI 0.011-0.071]. Referring to health check-up in the last year, the relative risk of having acute diseases verses having no disease decreases by a factor 0.018 for double orphans that checked-up more than once relative to those who checked-up once [CI 0.002-0.152]. The relative risk of having acute diseases versus having no diseases decreased by a factor 0.004 for double orphans that never checked-up in the last yeas relative to double orphans that checked-up once [CI 0.001-0.035]. Although not statistically significant (p>0.05), the relative risk of having chronic diseases as compared to having no diseases increased by a factor 4.679 for double orphans that checked-up more than once relative to double orphans that checked-up once [CI 0.914-23.965]. Most control variables showed not to be statistically significant with p-values that are above 0.05, hence they were not dwelled into.

TABLE 6: UNADJUSTED MULTINOMIAL LOGISTIC REGRESSION OF THE HEALTH AND SOCIO-DEMOGRAPHIC CHARACTERISTICS OF DOUBLE ORPHANS AND THEIR HEALTH OUTCOMES IN SOUTH AFRICA 2017.

No disease (Base outcome)	Relative risk ratio	P-value	95% Confidence interval	
Acute				
Perceived health status				
Above good (RC)				
Good	**0,072**	0,009	[0,010 -	0,513]
Below good	**0,092**	0,023	[0,012 -	0,720]
Health check-up in the last year				
Once (RC)				
More than once	**0,018**	0,000	[0,002 -	0,152]
never	**0,004**	0,000	[0,001 -	0,035]
Age				
10-14 (RC)				
0-4	2,167	0,395	[0,363 -	12,941]
5-9	0,874	0,843	[0,231 -	3,312]
Sex				
Males (RC)				
Females	2,055	0,234	[0,626 -	6,746]

No disease (Base outcome)	Relative risk ratio	P-value	95% Confidence interval	
Population group				
Black African (RC)				
Non-Black African	0,395	0,392	[0,047 -	3,329]
Number in a household				
One (RC)				
Two	2,327	0,353	[0,390 -	13,893]
Three	2,069	0,491	[0,259 -	16,502]
Four and more	0,775	0,788	[0,120 -	5,012]
Province				
Western Cape (RC)				
Eastern Cape	7,228	0,061	[0,914 -	57,137]
Northern Cape	3,170	0,393	[0,223 -	45,027]
Free State	1,998	0,609	[0,140 -	28,473]
KwaZulu-Natal	7,228	0,070	[0,847 -	61,681]
North West	8,780	0,091	[0,707 -	109,046]
Gauteng	3,775	0,241	[0,408 -	34,929]
Mpumalanga	0,000	0,000	[0,000 -	0,000]
Limpopo	2,273	0,540	[0,163 -	31,646]

No disease (Base outcome)	Relative risk ratio	P-value	95% Confidence interval	
Long term disease				
Perceived health status				
Above good (RC)				
Good	**0,011**	0,000	[0,002 -	0,071]
Below good	**0,093**	0,029	[0,011 -	0,779]
Health check-up in the last year				
Once (RC)				
More than once	**4,679**	0,064	[0,914 -	23,965]
never	0,177	0,156	[0,016 -	1,944]
Age				
10-14 (RC)				
0-4	0,000	0,000	[0,000 -	0,000]
5-9	2,410	0,234	[0,565 -	10,283]
Sex				
Females (RC)				

No disease (Base outcome)	Relative risk ratio	P-value	95% Confidence interval	
Males	0,562	0,432	[0,133 -	2,374]
Population group				
Black African (RC)				
Non-Black African	0,000	0,000	[0,000 -	0,000]
Number in a household				
One (RC)				
Two	0,838	0,864	[0,109 -	6,428]
Three	0,000	0,000	[0,000 -	0,000]
Four and more	0,565	0,451	[0,127 -	2,505]
Province				
Western Cape (RC)				
Eastern Cape	1,948	0,589	[0,172 -	22,047]
Northern Cape	1,059	0,965	[0,082 -	13,680]
Free State	0,000	0,000	[0,000 -	0,000]
KwaZulu-Natal	2,385	0,466	[0,229 -	24,837]
North West	2,929	0,452	[0,177 -	48,504]
Gauteng	0,993	0,996	[0,056 -	17,601]
Mpumalanga	0,000	0,000	[0,000 -	0,000]
Limpopo	0,000	0,000	[0,000 -	0,000]

Source: calculated from NIDS 2017 data.

Table 7 below shows the adjusted multinomial logistic regression. Only a few control variables such as perceived health status, health check-up in the last year, and sex were significant predictors of the health of double orphans ($p<0.05$). Referring to reported perceived health status, the relative risk of having acute diseases verses having no diseases decreases by a factor 0.054 for perceived health of double orphans that was reported to be good relative to perceived health reported to be above good [CI 0.006-0.445]. Furthermore, the relative risk of having acute diseases verses having no diseases decreased by a factor 0.026 for perceived health of double orphans that was reported to being below good relative to those with perceived health status reported as above good [0.002-0.407]. For the relative risk of having chronic diseases verses having no diseases for reported

perceived health status of double orphans, the results proved not to be statistically significant (p>0.05).

Shifting the attention to health check-up in the last year, the relative risk of having acute diseases verses having no diseases decreased by a factor 0.008 for double orphans that check-up more than once relative to those who checked-up once [0.001-0.106]. Furthermore, the relative risk of having acute diseases verses having no diseases decreased by a factor 0.002 for double orphans that never checked-up in the last year relative to those who checked-up once [0.000-0.032]. Conversely, the relative risk of having chronic diseases verses having no diseases increased by a factor 9.395 for double orphans that checked-up more than once relative to double orphans that checked-up once [1.907-46.293]. With focus on age, not all age groups proved to be significant predictors of the health of double orphans. The relative risk of having chronic diseases verses having no diseases increased by a factor of 4.109 for double orphans aged 5-9 yeas relative to those aged 10-14 years [1.137-14.849]. Looking at sex, the relative risk of having acute diseases verses having no diseases increased by a factor 4.609 for female double orphans relative to male double orphans [1.003-21.183]. Regarding province, the relative risk of having an acute disease verses having no diseases increased by a factor 13.104 for double orphans in the KwaZulu-Natal province relative to those in the Western Cape province [1.085-158.297].

TABLE 7: ADJUSTED MULTINOMIAL LOGISTIC REGRESSION OF THE HEALTH (DISEASE) OUTCOMES OF DOUBLE ORPHANS BY HEALTH AND SOCIO-DEMOGRAPHIC CHARACTERISTICS RAISED IN GRANDFAMILIES IN SOUTH AFRICA 2017.

No disease (Base outcome)	Relative risk ratio	P-value	95% Confidence interval	
Acute				
Perceived health status				
Above good (RC)				
Good	**0,054**	0,007	[0,006 -	0,445]
Below good	**0,026**	0,009	[0,002 -	0,407]
Health check-up in the last year				

Once (RC)				
More than once	**0,008**	0,000	[0,001 -	0,106]
never	**0,002**	0,000	[0,000 -	0,032]
Age				
10-14 (RC)				
0-4	2,020	0,624	[0,121 -	33,791]
5-9	1,310	0,762	[0,228 -	7,523]
Sex				
Males (RC)				
Females	**4,609**	0,050	[1,003 -	21,183]
Population group				
Black African (RC)				
Non-Black African	0,185	0,324	[0,006 -	5,298]
Number in a household				
One (RC)				
Two	3,289	0,266	[0,402 -	26,912]
Three	13,651	0,016	[1,624 -	114,776]
Four and more	1,646	0,667	[0,170 -	15,979]
Province				
Western Cape (RC)				
Eastern Cape	10,220	0,094	[0,670 -	155,978]
Northern Cape	8,604	0,141	[0,487 -	151,942]
Free State	8,341	0,187	[0,356 -	195,197]
KwaZulu-Natal	**13,104**	0,043	[1,085 -	158,297]
North West	4,620	0,256	[0,328 -	65,136]
Gauteng	2,947	0,429	[0,202 -	43,073]
Mpumalanga	0,000	0,000	[0,000 -	0,000]
Limpopo	7,158	0,343	[0,121 -	422,264]

No disease (Base outcome)	**Relative risk ratio**	**P-value**	**95% Confidence interval**	
Long term disease				
Perceived health status				
Above good (RC)				
Good	0,014	0,060	[0,001 -	0,133]
Below good	0,170	0,149	[0,015 -	1,889]
Health check-up in the last year				

Once				
More than once	**9,395**	0,006	[1,907 -	46,293]
never	0,524	0,605	[0,045 -	6,117]
Age				
10-14 (RC)				
0-4	0,000	0,000	[0,000 -	0,000]
5-9	**4,109**	0,031	[1,137 -	14,849]
Sex				
Females (RC)				
Males	0,177	0,061	[0,029 -	1,080]
Population group				
Black African (RC)				
Non-Black African	0,000	0,000	[0,000 -	0,000]
Number in a household				
One				
Two	0,314	0,136	[0,068 -	1,443]
Three	0,000	0,000	[0,000 -	0,000]
Four and more	0,239	0,198	[0,027 -	2,124]
Province				
Western Cape (RC)				
Eastern Cape	3,807	0,258	[0,375 -	38,682]
Northern Cape	1,309	0,829	[0,113 -	15,218]
Free State	0,000	0,000	[0,000 -	0,000]
KwaZulu-Natal	2,400	0,422	[0,282 -	20,438]
North West	3,659	0,354	[0,234 -	57,234]
Gauteng	0,567	0,658	[0,046 -	7,023]
Mpumalanga	0,000	0,000	[0,000 -	0,000]
Limpopo	0,000	0,000	[0,000 -	0,000]
Number of Observations	444			
Population size	711 383			
Number of strata	53			
Number of PSU	419			
Design df	366			
F (38, 329)	125			
Prob>F	0,000			

CHAPTER 5: DISCUSSION

5.1. Introduction

The study had one main objective, which was to examine the levels and socio-demographic characteristics associated with disease outcomes among double orphans (0-14 years) raised in grandfamilies in South Africa, 2017. To achieve the main objective, the study used three sub-objectives. The first sub-objective was to examine the distribution of the health and socio-demographic characteristics of primary caregivers and double orphans in South Africa, 2017. The second being to examine the levels of disease by health and socio-demographic characteristics of double orphans raised in grandfamilies in South Africa, 2017. The third sub-objective was to identify health and socio-demographic factors associated with diseases among double orphans raised in grandfamilies in South Africa, 2017. With all these sub-objectives at hand, this chapter discussed the results of the study in relation to the contents of literature in parts of the world and South Africa in particular.

5.2. Discussion

The study examined the levels and socio-demographic characteristics associated with disease outcomes of double orphans aged 0 to 14 years raised in grandfamilies in South Africa, 2017. With previous studies focusing less on the physical health outcomes of double orphans in South Africa, a need to examine physical health outcomes of double orphans was catered for by the study. With child mortality, led to by child morbidity, being one of important indicators of health and development in a country, understanding child health outcomes directly informs policy and planning (United Nations Children's Fund, 2011). Poverty, orphanhood, and child morbidity in

different households have starred much debate to develop child health policy that is target based on the vulnerable (Cluver et al., 2013; Nsagha et al., 2012; SAHRC & UNICEF, 2016). Due to both parents being diseased, orphans have become a vulnerable group, and this study saw it fit that understanding their physical health outcomes contributes to targeted interventions and policy implementation.

Health among children in South Africa indicated to be generally good. The descriptive results of the study did show that 93% double orphans aged 0 to 14 years raised in grandfamilies in South Africa had no disease by the year 2017. Contrary enough, existing literature did argue that health among orphans is relatively poor and one in fifteen children are still dying from 32-54% of preventable diseases in South Africa (Bower, 2014; Dorrington et al., 2018; Mabaso et al., 2014; Skinner et al., 2013). Furthermore, literature argued that due to old age and poor health, grandparent caregivers are limited in providing consistent health related care to double orphans (Aransiola et al., 2017; Lombard & Kruger, 2009). Due the mentioned, it is quite interesting to see how the health of double orphans raised in grandfamilies is above 90%, to a certain degree proving that grandparent caregivers are well capable of caring for double orphans and positively influence their health status. Even a study by Thielman & colleagues (2012) showed that 77% of orphans had good health.

With double orphans showing to generally be in good health, their grandparent caregiver also reported to perceive the health of 86.06% of double orphans to be above good but almost fifty percent (48.35%) never had a health checked-up in the last year. It is not new for grandparent caregivers to perceive the health of grandchildren to be good or above good. Earlier in 2008, two-thirds of caregivers in South Africa perceived children under their care to have good health (Patel et al., 2017). Furthermore, studies did argue that access to health among orphans is low due to

distance to health facilities and not having a biological parent to take the child to a health facility (Cluver et al., 2013; Mokgatle & Madiba, 2015). The low frequency of health check-up may be due to lack of access to health care facilities. Even so, 16.17% of double orphans who checked-up their health once had acute diseases and only 1.39% had chronic diseases. Furthermore, 5.38% of double orphans that checked-up more than once had chronic diseases as compared to 0.58% that had acute diseases. It is not surprising as Cluver and colleagues (2013) did indicate that Aids orphaned children living in poverty were more at risk of being HIV positive in South Africa between 2009 and 2011, and may also be the case in recent times. In general term, there are more double orphans with acute diseases compared to double orphans with chronic diseases. Mokgatle & Madiba (2015) did show that orphans are more likely to be diagnosed late for HIV and Aids and received treatment late. This may be one of the reasons as to why there are fewer orphans with chronic diseases in the study, as there are possibilities of late and low diagnosis. With Skinner & colleagues, (2013) showing that in the North West Province only 65.4% of double orphans had access to health care, this might support the findings of low health consultation (48.5%) among double orphans in South Africa. But again most double orphans have no medical aid, hence many do not consult health professionals (Bramlett & Blumberg, 2007).

The unadjusted multinomial logistic regression results presented perceived health status and health check-up to statistically predict the health outcomes of double orphans. Furthermore, the relative risk of having acute and chronic diseases verses having no diseases kept on decreasing by different factors for the health of double orphans perceived to be below good and good relative to being above good given covariates in the model are held constant. The adjusted model presented results that showed perceived health status, health check-up in the last year, and sex as significant predictors of diseases outcomes among double orphaned children raised in grandfamilies in South

Africa. The relative risk of having an acute disease verses having no disease decreased for double orphans perceived to have good health and below good relative to those perceived to have health status above good. These results are supported by Thielman et al. (2012) as he showed lower rates of short term illness among 77% of orphans that were reported to have good health while only 20% were reported to have poor health. The relative risk of having chronic diseases verses having no diseases was higher for double orphans that did a health check-up more than once relative to those that checked-up once. The result may be due to some orphans being AIDS orphans that are already HIV positive due to mother-to-child transmission (Kanamori et al., 2015; Lombard & Kruger, 2009). The increased risk of having chronic diseases verses having no diseases may also be due to more health check-ups being done as children leaving closer do health facilities have been argued to better know their health due to frequent visits (Hall & Posel, 2012).

The regression results also showed that the relative risk of having chronic diseases verses having no diseases to be higher for ages 5-9 yeas relative to the older age 10-14 years. The results do agree with literature that argued the risk of HIV and other health problems to increase with increasing age among orphans due to late diagnosis and starting to take antiretroviral treatment late (Mokgatle & Madiba, 2015). Furthermore, the relative risk of having acute diseases verses having no diseases was higher among female double orphans relative to male double orphans. This may be due the fact that there are more female double orphans compared to male double orphans (Casale et al., 2015; Embleton et al., 2014; Muller-Kluits & Slabbert, 2018).

The study was able to successfully apply the theoretical framework Building Early Relationships Model of Change by Morris et al (2017). The theoretical framework is complex but was strong enough to build foundation of the study. The only weakness the theoretical frame work had was having few variables under the characteristics of the child. Even with weaknesses found in the

theoretical framework, the results were able to present the links (pathways) between the characteristics of the caregiver, the child, and the health outcomes of double orphans in South Africa, 2017. The theoretical framework may need some improvement by adding more characteristics of children but it is strong enough to be applied by other studies interested in the relationship between child characteristics and their health outcomes.

CHAPTER 6: CONCLUSION AND RECOMMENDATIONS

6.1. Conclusion

The study achieved its set objectives and measures were done with undivided attention. The study concluded that double orphans in South Africa are generally in good health as the prevalence of disease was only 7% in 2017 (5% acute and 2 % chronic). However, the study still finds 7% as a major concern because presented chronic diseases are infectious and might spread if not given enough medical attention. The prevalence of 7% should be reduced to 0% as child health is of much importance in every community. The seriousness of the prevalence was seen when observed by different socio-demographic characteristics such as age, sex, and population group. Significant predictors of the health outcomes of double orphans were identified and can further be investigated.

The results of this study contribute to existing literature in South Africa by means of providing statistical results that are representative at the national level, and by bringing more understanding on the number and general conditions of double orphans in South Africa, 2017. Double orphans are a vulnerable group and need to be cared for by providing social and economic assistance to their grandparent caregivers. Taking note that more than 60% of grandparent caregivers do not have regular income, the study further recommends that there should be social services that support grandfamilies financially and socially by having external caregivers that land a helping hand, as social grants are not enough to solve complex issues related to their health.

6.2. Recommendations

The results from the study supports the recommendation of having more financial and social support for double orphans in South Africa. Social support can be achieved through interventions such as family- and community-based preventive developmental welfare programmes (Patel et al., 2017). The National Development Plan and National Integrated Early Childhood Development policy can use this study to inform their interventions that use community health worker to focus health care at household level on double orphans in grandfamilies. The intervention can include social and health education, and preventive strategies (Patel et al., 2017). The Children's Amendment Bill of 2006 was amended to cater for children made vulnerable and orphaned by HIV and Aids (Chandiwana et al., 2007). But the amendment bill still needs to look at the needs of individual households and give more relief to grandparent caregivers. The 1997 White paper for the transformation of the health system in South Africa did not recognize double orphans in their strategies (Department of Health South Africa, 1997). This paper recommends for future policy makers to use studies such as this to look at the level of health among children, and double orphans in particular. There is also a need for more studies that focus particularly to double orphans in grandfamilies, in order to further understand their well-being and health. The health of grandparents and that of double orphans make them vulnerable groups which need undivided attention. This study will in future examine how grandparent characteristics and household characteristics determine the health of maternal, paternal, and double orphans.

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APPENDIX 1

TABLE 8: CORRELATION MATRIX.

	Perceived health status	Health check-up in the last year	Age	Sex	Population group	Number in a household	Province
Perceived health status	1,0000						
Health check-up in the last year	-0,1621	1,0000					
Age	-0,0066	0,1006	1,0000				
Sex	0,0009	0,0708	0,0061	1,0000			
Population group	0,0261	0,1161	-0,0511	-0,0072	1,0000		
Number in a household	-0,0876	0,0699	0,0527	-0,0389	0,0052	1,0000	
Province	-0,0277	0,0618	-0,0149	-0,0241	0,0071	-0,0419	1,0000

Source: calculated from NIDS 2017 data.

TABLE 9: LITERATURE REVIEW MATRIX OF TWO SELECTED INFLUENTIAL STUDIES.

Author(s)	Title and Year	Theories (y/n – which ones)	Study Design	Data Source	Methods	Level of Analysis	Results / Findings	Gaps
Aransiola, J. O., Akinyemi, A. I., Akinlo, A., & Togonu-Bickesteeth, F.	Grandparenting in Selected West African Countries: Implications for Health and Hygiene Behaviours in the Household. (2017)	Yes - Structural models of family social health theory (Family resources directly influence dynamics such as family management, emotional climate, care behaviors, and childcare quality.	Quantitative	Demographic and Health Survey (DHS). The study used the DHS of Ghana (2014), Liberia (2013), Nigeria (2013), and Sierra Leone (2013).	Use of secondary data (DHS). The analysis was based on the Persons Recode (PR). The study was only interested only on households headed by grandparents who are also bread winners, also those above reproductive ages, and living with orphaned children.	Individual	Households identified to be headed by grandparents that are bread winners were 20 841. From the households Nigeria had the highest percentage of grandparents (35,1%), followed by Sierra Leone (31,4%), Liberia (21,5%) and last Ghana (12,0%). With regards to health and hygiene behavior in grandfamilie	The study is descriptive and shows no inferential statistics which could have shown in-depth knowledge on the relationship between demographic and health and hygiene characteristics of orphans in grandfamilies.

Author(s)	Title and Year	Theories (y/n – which ones)	Study Design	Data Source	Methods	Level of Analysis	Results / Findings	Gaps
							s, 60% and more of grand families had access to mosquito nets buy 50% and more were not using the nets, and the highest non-use was in Nigeria (78,6%). Given the high percentage of grandfamily households with no mosquito nets, grandchildren (orphans) are highly exposed to Malaria and	

Author(s)	Title and Year	Theories (y/n – which ones)	Study Design	Data Source	Methods	Level of Analysis	Results / Findings	Gaps
							poses a major public health issue.	
Mokgatle, M & Madiba, S 2015	The burden of disease on HIV-infected orphaned and non-orphaned children accessing primary health facilities in a rural district with poor resources in South Africa: a cross-sectional survey	No	Quantitative. Cross sectional	Primary data collected between June and September 2013 in the Nkangala district of Mpumalanga province. The sample was 406 primary caregivers of HIV positive children	The data was collected in 34 primary healthcare facilities and two community hospitals. Trained field workers collected the data in semi-structured interviews, using interviewer-administered questionnaire	Individual	Regarding orphanhood status, 45.1% of children were maternal orphans, 31.5% paternal orphans, and 39.9% were double orphans. The study did note that the percentages (%) did not add up to	The study was predominantly conducted in rural Mpumalanga. Given that it was mentioned and the data was primary data collected in health institutions, there is still a need to know the

Author(s)	Title and Year	Theories (y/n – which ones)	Study Design	Data Source	Methods	Level of Analysis	Results / Findings	Gaps
	of primary caregivers of HIV-infected children aged 5–18 years. 2015			aged 5 to 18 years.	s. Only primary caregivers aged 18 years and above, caring for of HIV positive children, were included in the study. During visits to the health care facilities and hospitals, interview were then conducted to interview caregivers accompanying children for consultations.		100% because children who were double orphans were calculated from maternal and paternal orphans. Compared to non-orphans, odds shower maternal orphans to be diagnosed of HIV late and in older ages, and also started their antiretroviral treatment later. The burdain of infection among children was highest before being	characteristics and health status of children and orphans in other provinces. The age of children interested in was only those aged 5 to 18 years, leaving a gap in knowing the health dynamic facing children younger than 5 years cared for my biological, relative (related), and grandparent primary caregivers.

Author(s)	Title and Year	Theories (y/n – which ones)	Study Design	Data Source	Methods	Level of Analysis	Results / Findings	Gaps
							diagnosed with HIV, and more children were hospitalized after diagnosis. Orphanhood played a major role as it proved to be associated with the age at which antiretroviral treatment was started and how long the child would be on treatment.	HIV and Aids and tuberculosis are some of the top prevalent diseases in South Africa. Given that the study did not include any other disease caregivers and orphans might have been suffering from, it only showed if children may be suffering from a single or multiple infection, without naming them. Leaving a

Author(s)	Title and Year	Theories (y/n – which ones)	Study Design	Data Source	Methods	Level of Analysis	Results / Findings	Gaps
								gap in knowing which other disease is present among children which are HIV positive.