University of KwaZulu-Natal

CHILDHOOD AND ADULT DISABILITY:

IMPACTS ON EDUCATION AND THE LABOUR MARKET IN SOUTH AFRICA.

By

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Declaration

I, Tamlyn Candyce McKenzie, declare that

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Abstract

Equal opportunities in education and the labour market are prioritised on the global agenda for people with disabilities. It is widely acknowledged that people with higher levels of education are more likely to find employment and to earn more compared to people with lower levels of education. Any negative impact on educational attainment during school-going years may result in long term labour market consequences in adulthood. People who are unable to access education, may fall into poverty and poverty makes people more vulnerable to acquiring disabilities. In addition, people with disabilities are less likely to participate in the labour market and if they do are more likely to be unemployed thus perpetuating this disability and poverty cycle.

As a means of monitoring the Convention on the Rights of Persons with Disabilities, an internationally recognised and comparable survey instrument designed by The Washington Group (WG) was incorporated into the General Household Survey (GHS) in South Africa from 2009. Very little academic research has been conducted in South Africa using the WG questions yet the White Paper on the Rights of Persons with Disabilities prioritises monitoring and evaluation through rigorous research.

This thesis demonstrates the ways in which household survey questions on disability have evolved over time due to the conceptual changes from the medical model of disability to the social model and how these questions can be used to measure disability prevalence. Using the GHS and the WG set of questions, the thesis estimates how childhood disability is associated with school attendance and progression. The findings strongly suggest that children with disabilities, particularly those with more severe disabilities, are more likely to be out of school and when they are in school they are at least two years behind their peers without disabilities. For adults with disabilities the probability of labour market participation and employment is lower. In addition, there is a notable gap in earnings between people with and without disabilities. Severe disabilities (involving physical and cognitive impairments) have worse outcomes overall. Importantly, the results suggest that if people with disabilities are able to attain equivalent levels of education to their peers without disabilities, their labour market outcomes improve significantly. This study therefore demonstrates the vital importance of education and the need for education to be the primary focus of policy efforts for people with disabilities.

[Key Words: Disability; Education; Labour Market; Household Surveys]

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Prologue

In June 2014, my friend gave birth to a baby boy in Durban, South Africa. It would be a few days before confirmation that he had Down syndrome. Needless to say my friends' world was turned upside down, the news being completely unexpected. They felt scared and underprepared and the first few months were hard on the family as they sought to navigate this diagnosis and understand the difficulties that their little boy may endure going forward. However, despite their worries, the more they learned, the more they felt a deep calling to advocate for their precious child and other children with Down syndrome.

They are fortunate enough to have financial resources and connections and have been able to provide their child with every support service he needs from occupational and speech therapy to physiotherapy and specialist doctors. However, the one thing that continues to evade them is education. Despite all of their resources and advocacy, despite all of their drive and determination to provide their child with a good education, society still closed the door on them. In their experience they have found that some private schools offer places to children with disabilities but this is often conditional and not always permanent. For example, the parents are usually required to pay extra for the services of a facilitator to assist their child in the classroom. Sometimes the stigma and limitations placed on the children in the classroom become impossible for the parents and child to overcome without sufficient support from the school itself. Some parents have therefore been known to pull their children out of mainstream schooling altogether[1].

Now 7 years old, and of compulsory school age, my friend's son has largely been left with no option but to either attend a special needs school or be home schooled. Home schooling is a reasonable option but it is only feasible for parents with the means to provide this form of education and can still be isolating for the child in terms of socialisation. If people with financial means are unable to advocate for their children with disabilities to attend mainstream schooling, those living in vulnerable socioeconomic circumstances may face an insurmountable challenge in terms of educating their children.[2] This is very hard for parents with children with disabilities to reconcile as all parents wish to provide the best possible opportunities for their children both in terms of education and future employment. The story and lived experience presented here was the personal inspiration for my interest in the field of disability research and alongside the need for more academic research in this field in South Africa provided a strong motivation for the work that follows.

[1] Anecdotal evidence provided by mothers involved in the NPO: ***Downside Up*** based in Durban, South Africa.
[2] The story described above follows the experience of a dear friend and is the inspiration behind this thesis.

Chapter One

Introduction

People with disabilities are particularly vulnerable to societal exclusion and this is typically explained through a two-way causal link between disability and socioeconomic vulnerability. Firstly, people with disabilities may have fewer opportunities for education and therefore worse labour market outcomes which lower their socioeconomic status. Secondly, people in lower socioeconomic circumstances may have poorer living conditions and less access to healthcare and other resources making them more prone to disabilities which then hamper their labour market outcomes further (Filmer, 2008; WHO, 2011; Mitra, Posarac & Vick, 2013a). Opportunities for education largely occur in childhood and often children with disabilities experience difficulties accessing education which may lead to longer term labour market consequences and even if disabilities are acquired in adulthood, people with disabilities tend to have lower levels of labour market participation and employment overall (Stabile & Allin, 2012; Mitra, Posarac & Vick, 2013b; Mizunoya & Mitra, 2013a; Graham et al., 2014; Mizunoya, Mitra & Yamasaki, 2016; Hanass-Hancock & McKenzie, 2017; Deghaye, 2021).

Globally, it is found that most of the population of people with disabilities live in low-income countries, and women and children in particular are disproportionately affected by disability (Braathen & Loeb, 2011; Groce et al., 2011; Madans, Loeb & Altman, 2011; Wazakili et al., 2011). The global prevalence of disability is 15 percent (World Health Organisation, 2021) and is expected to increase over time for reasons such as prolonged life expectancy and associated chronic illnesses, unhealthy lifestyles, environmental factors including natural disasters, transport and other accidents as well as violence related injury (Department of Social Development, 2016).

Considering the concerns regarding socioeconomic vulnerability and disability, South Africa is considered one of the most unequal societies in the world, with vast discrepancies between the rich and the poor. In 2015 the World Bank estimated South Africa's Gini coefficient at 0.63, and research suggests that income inequality has increased rather than decreased since the end of apartheid, despite a small decline in poverty (Leibbrandt et al 2010; World Bank 2015). The unequal distribution of income is partially attributed to the labour market as poor individuals have difficulty finding work and are therefore less likely to be employed. Even when the poor are employed, they tend to earn less than those who are not poor (Buger and Woolard 2005). This could also be due to a lack of education due to circumstances of socioeconomic vulnerability. Given that people with disabilities are especially

vulnerable to worse socioeconomic circumstances, South Africa's existing unemployment problem and limited economic growth may cause them to face further barriers to education and employment.

It is therefore important to collect empirical evidence on people with disabilities in South Africa in order to monitor both educational and labour market outcomes. This information may assist in supporting or advocating for policy implementation that will improve the lives of these individuals and households. The analysis presented in this thesis will produce some of the first empirical evidence using nationally representative household survey data focusing on the relationship between disability and childhood education (access and progression) as well individuals' access to and performance in the South African labour market.

The term disability is used to describe a collection of concepts including the type and severity of impairment as well as the disabling effects of the society or the environment in which a person lives. Someone may have a physical disability or a cognitive disability, someone may have more than one type of disability, and the impact that their disability has on their daily life and how society accommodates their disability may differ from person to person. Given these nuances, there is no straight forward definition of disability but rather numerous ways in which disability is conceptualised (Palmer & Harley, 2012; Altman, 2014).

The conceptualisations of disability have evolved over time from the medical model of disability to the social model. This is reflected in the progression from the World Health Organisation's (WHO) International Classification of Impairments, Disabilities and Handicaps of 1976 to the International Classification of Functioning in 2001 culminating in the United Nations Convention on the Rights of Persons with Disabilities in 2007 (CRPD). These changes in global human rights policies for people with disabilities have influenced the way in which country-specific policies and practices are designed and developed. This includes the addition of disability-specific questions in national census and household surveys that allow countries to monitor the implementation of policies aimed at addressing disability rights.

Since the emergence of democracy in South Africa, the government has taken strides to address the various inequalities that were once pressed upon the people of the country. These have included issues beyond race, namely gender and disability rights. Particularly in the case of disability, South Africa has closely followed the example of the international community as shifts have been made in terms of how disability is conceptualised and how disability is included into mainstream issues (Department of Social Development, 2008, 2015, 2016). It is acknowledged that in South Africa, the implementation of legislation pertaining to disability rights has historically been problematic (The Child Healthcare Policy Institute & The South African Federal Council on Disability, 2001). However, in more recent times,

South Africa has made it clear through documents such as the White Paper on the Rights of Persons with Disabilities (WPRPD) 2016 that it aims to accelerate the promotion and protection of the rights of people with disabilities as equal citizens.

The Constitution of 1996 (Department of Social Development, 2016: 6) states that "Everyone is equal before the law and has the right to equal protection and benefit of the law. Equality includes the full and equal enjoyment of all rights and freedoms. To promote the achievement of equality, legislative and other measures designed to protect or advance persons or categories of persons, disadvantaged by unfair discrimination may be taken". As such, South Africa ratified the UN CRPD in 2007 (Department of Social Development, 2016) thereby committing to respect and ensure the implementation of the rights of persons with disabilities in all aspects. South Africa has been said to follow the social model of disability because of the recognition that disability is not merely a medical condition but is also impacted by society and the environment (Department of Social Development, 2008)

The South African White Paper on the Rights of Persons with Disabilities 2016 (WPRPD) aims to ensure that people with disabilities are afforded opportunities for full participation in work and education as well as equality in all aspects of life (political, human, social and economic) (Department of Social Development, 2016). South Africa also acknowledges the valuable role the international community plays in supporting the implementation of these policies in terms of sharing their learnings and experiences. "Ensuring that all children with disabilities have access to quality education will help South Africa meet its employment equity goals in the long run" (Department of Social Development, 2016: 96). Exclusion from education often reflects a broader issue of exclusion which may be experienced by children with disabilities.

In recent efforts to bring disability matters into the mainstream, the Washington Group on Disability Statistics, appointed by the UN Statistical Commission, developed a short set of questions to enable various census and household surveys to collect reliable data on people with disability. As a result of this, there is a substantial emerging body of literature internationally whereas few South African studies have produced research on education and the labour market using this survey tool. South Africa has since 2009, included this set of questions into a few of the national household surveys namely the Census 2011, the Community Survey 2016 and the GHS 2009 onwards.

Education is mandated as a basic human right and the government have detailed policies on inclusive education in mainstream schools, yet practically this is not happening on the ground. Although South Africa aims towards inclusive education, the unfortunate reality is that mainstream education is still nowhere near being inclusive. This is largely due to a lack of knowledge and resources in schools and

as such schools are just not prepared to take on children with special needs especially children with cognitive difficulties such as those with autism or Down syndrome (Deghaye, 2021).

Article 27 of the CRPD stipulates that people with disabilities have a right to choose the work they wish to do, to work on an equal basis to others and be accepted into an inclusive environment that is accessible through means of reasonable accommodation. To that end, the agreement requires governments to advocate for and protect the rights of people with disabilities in their countries and to provide opportunities for them in the area of employment including the removal of barriers such as stigma and discrimination (United Nations, 2014a). This thesis aims to provide an overview of the current status of people with disabilities in terms of prevalence, education, labour market participation, employment and earnings. The results presented in this thesis may therefore serve as a baseline for future surveillance data on people with disabilities in South Africa.

The overall aim of this thesis is to investigate the impact of childhood and adult disability on education and the labour market in South Africa. This will be done using data from relevant nationally representative household surveys. The main research objectives are as follows:

i. To identify the relevant South African household surveys which collect demographic and labour market information alongside questions on disability; To determine how disability can be measured using these surveys and to estimate the prevalence of disability in South Africa.

ii. To determine the school attendance and progression for children with disabilities compared to children without disabilities (7-15 years).

iii. To estimate the overall educational attainment and labour market outcomes such as participation, employment and earnings for adults with disabilities compared to adults without disabilities (16 to 59 years).

This thesis consists of four main chapters excluding the introduction and conclusion chapters. The following chapter, namely chapter two, presents the pertinent literature on disability which includes the conceptualisation of disability through the various disability models. Chapter three focuses on disability measures and prevalence, chapter four looks at how disability impacts on childhood educational attainment and chapter five examines how disability can impact labour market outcomes for adults.

Chapter three begins the empirical contribution of the thesis. The chapter provides an overview of the South African nationally representative household surveys that include relevant disability, education and labour market information. Four main surveys offer possibility for the analysis required by the

overarching research problem of this thesis. These are the Census, the Community Survey, the General Household Survey (GHS) and the National Income Dynamics Study (NIDS). Some of these surveys have undergone an evolution in the nature of their disability questions over time as a result of the changing conceptualisation of disability from the medical model to the social model. This evolution is documented and the disability questions are discussed in the context of the disability models from which they are derived.

In addition, a detailed discussion on the internationally-comparable Washington Group short set of questions (WG-SS) is included in this analysis as this particular set of questions has been incorporated into multiple surveys in South Africa. This leads to a description of the ways in which each survey question or set of questions can be used to measure disability. Thereafter a series of prevalence estimates are presented for each of the surveys and measures. These estimates illustrate the overall prevalence of disability in South Africa as well as demonstrating the differences that result from various measures of disability. The measures of disability discussed in this chapter inform the measures that are used in the analysis of children and adults in chapters four and five respectively. The remaining chapters use the pooled dataset from seven years of the GHS namely 2011 to 2017. This choice of dataset is explained in chapter three.

Chapter four explores educational outcomes for children of compulsory school going age, which in South Africa is 7 to 15 years. This analysis investigates whether children with disabilities are attending school and if they are, whether they are progressing in a similar manner to their peers without disabilities. The chapter includes descriptive analyses of the extent and nature of school attendance, as well as multivariate analyses that account for the characteristics of children and their households. The analysis is conducted for each of the disability measures identified in chapter three as well as for each disability type. Using a variety of measures of disability enables a comparison in terms of the extent to which the nature, complexity and severity of disability influences children's access to education.

The final analysis chapter, chapter five explores labour market outcomes for adults with disabilities. The objective of the chapter is to assess the extent to which people with disabilities experience equality in terms of labour market outcomes compared to people without disabilities. Labour market outcomes in this thesis refers to participation, employment and earnings. Lastly, to conclude this thesis, chapter 6 presents a summary of the main findings from each chapter as well as discussing recommendations for policy implementation and future research with regards to people with disabilities.

Chapter Two

Literature review: conceptualising disability and the links to socioeconomic vulnerabilities

2.1 Introduction

Disability is considered a global public health issue whereby 15 percent of the world's population is estimated to have some type of disability and between two and four percent of people have severe disabilities (World Health Organisation, 2021). The majority of the world's population of people with disabilities live in low-income countries, while women and children in particular are disproportionately affected by disability (Braathen & Loeb, 2011; Groce et al., 2011; Madans, Loeb & Altman, 2011; Wazakili et al., 2011). Disability is no longer simply considered a medical condition but rather is viewed in the context of the environment in which someone lives (World Health Organization, 2010; Palmer & Harley, 2012). Society is said to further amplify disabilities as a result of inherent stigma and lack of reasonable accommodation. Reasonable accommodation refers to adjustments or modifications that enable better accessibility such as ramps, sign language, transport and provision for service animals (Department of Women Youth and Persons with Disabilities, 2020). The conceptualisation of disability has changed and as a result so have disability models, most notably from the medical to the social model and this has also led to changes in the way in which disability is measured (Altman, 2001; Madans, Loeb & Altman, 2011; Palmer & Harley, 2012).

As a result of the development of the social model of disability, there has been a call to integrate disability rights and inclusive policies across all development programmes rather than treating disability as a stand-alone medical matter (Wazakili et al., 2011). The mainstreaming of disability in global policy serves to ensure that people with disabilities are able to secure their rights as full and equal members of society (McEwan & Butler, 2007). However, there is a notable absence of relevant statistics and surveillance of people with disabilities in many countries, and particularly in developing countries. This can be attributed to the earlier lack of disability-related questions in large scale surveys or to incomparable or inefficient survey instruments (Altman, 2005; Filmer, 2008a; Groce et al., 2011; Loeb et al., 2011; Mizunoya & Mitra, 2013). The United Nations Convention on the Rights of Persons with Disabilities (CRPD) of 2007 explicitly calls for countries that have ratified the CRPD to ensure that data are collected for people with disabilities. Such data may provide grounds to inform policy decisions and monitor implementation (Groce et al., 2011; Loeb et al., 2011). The Washington Group on Disability Statistics were convened for this purpose and designed three sets of questions on disability – a short set, an extended set, and a child specific set for use in census or household surveys (Loeb, Eide

& Mont, 2008; Washington Group on Disability Statistics, 2014, 2016; UNICEF, 2017; Cappa et al., 2018).

This chapter provides a review of the relevant literature on the evolution of the disability models and the relationship between disability, education and labour market outcomes. Section 2.2 delves into the conceptualisation of disability and the various means of defining and measuring disability for research purposes, and how these have evolved over time. Thereafter, section 2.3 reviews the literature on disability and socioeconomic vulnerability, section 2.4 examines the link between disability and education. Section 2.5 reviews the literature on the association between disability and labour market outcomes and finally, section 2.6 concludes the chapter.

2.2 The evolution of disability models and the conceptualisation of disability

Disability is considered to be a major health issue, but trying to define it as a single concept is problematic. This is in part because the level of disability that someone experiences is affected by societal and environmental factors. In terms of the medical aspect of disability, it is common for people to seek health-care services when their disease or injury leads to difficulty performing any tasks they could previously execute. Health-care providers consider a case to be clinically significant when it limits a person in terms of day to day living (Üstün, 2010). However, studies on chronic illness and disability have rejected a pure medical approach in analysis due to the fact that this "overstates the importance of physicians and understates that of global and economic power structures" (Charmaz & Belgrave, 2015: 2). Advances in medicine are associated with longevity and as such any chronic illness or disability needs to be managed for a longer time period. Thus, in terms of public health, disability is becoming as important as mortality (Üstün, 2010; World Health Organisation, 2021). It is thought that whilst people with chronic conditions, such as disability, require intermittent periods of treatment by physicians, they should be seen first and foremost as people and not as patients, and it is therefore critical to also examine the effect of society on their socioeconomic well-being. (Hanass-Hancock, Regondi & Naidoo, 2013; Charmaz & Belgrave, 2015). This is because society or the environment in which a person lives can actually have disabling effects on a person with disabilities who may otherwise be fully functional in society.

South Africa has one of the largest populations of people living with HIV/AIDS and a significant body of literature in South Africa has examined the disabling effects of HIV as well as demonstrated that people with disabilities are vulnerable to HIV (Hanass-Hancock, 2009; Hanass-Hancock, Regondi & Naidoo, 2013). It is generally accepted that due to the strides that have been made in terms of treatment for HIV/AIDS, individuals are able to live a long life despite the condition. This further promotes the importance of examining the livelihoods of these individuals, and the extent to which they are able to

assimilate in education and the workforce (Hanass-Hancock, 2009; Jan, Essue & Leeder, 2012; Whiteside, 2014; Charmaz & Belgrave, 2015).

Whilst there is a clear causal link between illness and disability, there are numerous ways of conceptualising disability. Disability models represent the progression of thought regarding disability and participation in society (Altman, 2001). For many years, disability was thought of purely as a medical diagnosis that requires treatment or rehabilitation (Parsons, 1975; World Health Organization, 1980; Office of the Deputy President., 1997; Oliver, 1998, 2004; Fujiura & Rutkowski-Kmitta, 2001; Mitra, 2006; Mont, 2007). In recent times, the community of people with disabilities have deemed this to be only one facet of disability, and have emphasised that society can impose disabilities on individuals through its inability to accommodate them (Oliver, 1990; Altman, 2001). The social model arose because the community of people with disabilities felt the use of the language of the medical model of disability in policy documentation was problematic, viewing disability as the problem of the individual alone. The social model leads to policy developments and political action that aims to address the socioeconomic links to disability which is better suited to ensuring inclusivity overall (Oliver, 1990; Altman, 2001).

Disabilities cannot all be treated in the same manner. Some will certainly require healthcare interventions, while others might require a change of attitude or adaptation of the physical environment, and some may require a combination of medical treatment and social accommodation. This section of the chapter examines the various approaches to conceptualising disability namely through the medical and social models of disability and combination approaches. The structure of the presentation of these models represent the chronology of the development of thought on the relationship between disability and society.

2.2.1 The Medical Model

Prior to 1980, the main method of conceptualising disability for research was through what has become known as the ‘medical model’. This model places emphasis on a medical diagnosis of impairments or disabilities, and much of the research using this paradigm focuses on developing interventions to help cure impairments or normalise bodily functions (Parsons, 1975; World Health Organization, 1980; Office of the Deputy President., 1997; Oliver, 1998, 2004; Fujiura & Rutkowski-Kmitta, 2001; Mitra, 2006; Mont, 2007). The medical model considers disability as a problem of the individual person and therefore is focused on treatment or rehabilitation for the individual (Brisenden, 1986). However, in order to understand the lived experience of people with disabilities, it is important to understand more than simply a medical diagnosis (Brisenden, 1986).

The foundations of the WHO International Classification of Impairment, Disability and Handicap (ICIDH) of 1980 are rooted in the medical model given that it medicalises disabilities by equating poor health with disability (Pfeiffer, 1998). The ICIDH follows the four-stage linear approach illustrated in Figure 2.1 below, where it begins with a disease or medical condition which then leads to an impairment that results in a disability and then handicap.

Figure 2.1: The WHO International Classification of Impairment, Disability and Handicap (ICIDH)

(World Health Organization, 1980: 11)

Accordingly, impairment is defined as "any loss or abnormality of psychological, physiological or anatomical structure or function" (World Health Organization, 1980: 27). Impairments deal with bodily structure and disorders at the organ level. Disability refers to activity limitations as a result of impairment; it is the consequence of impairment in terms of functioning and represents difficulties at the level of the person. Handicap is considered a disadvantage that results from an impairment or disability that limits or prevents the fulfilment of a role that is normal (depending on age, sex, social and cultural factors) for that individual. Handicap refers to the disadvantages experienced by the person with disabilities in terms of adaptation and interaction between individuals and their surroundings (World Health Organization, 1980; Barnes & Mercer, 1992; Fujiura & Rutkowski-Kmitta, 2001). Handicapist language refers to vocabulary that devalues the person with disabilities including anything that associates negative attributes with disability (Pfeiffer, 1998). Using negative terms such as handicap places the person in the role of victim.

The medical model implies that disability prevalence is established fundamentally through medical diagnoses and that the state should offer medical support to those affected. There is no consideration of the difficulties these individuals face in terms of societal inclusion. The medical model is therefore largely centred on the provision of appropriate health-care and rehabilitation services. This approach has therefore been criticised heavily by people with disabilities, and is now classified as the 'old paradigm' due to the move towards the social model (Office of the Deputy President., 1997; Oliver, 2004; Mitra, 2006; Mont, 2007).

2.2.2 The Social Model

As a result of the disability civil rights movement and a drive towards equality, disability is now considered to be a social issue that stems from the interaction between the individual and their physical or social environment (Oliver, 1996; Mitra, 2006; Altman, 2014). The move away from the medical model towards the social model in the early 1980s is not necessarily intended to discount the fact that most types of impairment have an underlying medical diagnosis. However, the means of conducting social science research in the past using the medical approach led to individuals being placed in a victim role whereby all the responsibility for the problem was placed on the individual (Oliver, 2004; Barnes, 2009).

Disability research consequently came under significant criticism from the community of people with disabilities (Oliver, 2004; Barnes, 2009; Altman, 2014). They argued that disability should be seen as a social construct whereby society creates the disability by unnecessarily excluding people with impairments (health condition) from full participation in society (Oliver, 2004; Mitra, 2006). This implies that, if society makes provision to accommodate people with disabilities, these individuals would be fully functional in society. Accommodation would include, amongst others, consideration of the design and access to buildings, effective modes of transportation and appropriate methods of communication, as well as the attitudes of individuals towards people with disabilities. Stigma or discrimination imposed by the general public also serves as a barrier to full inclusion in societal activities (Barnes & Mercer, 1992; Oliver, 1996).

In 1982, Disabled People's International (DPI) constructed their own definition of disability which fits in to the social model. The DPI definitions contrast significantly from the WHO's ICIDH model discussed previously, which was based on the medical model of disability. The DPI uses the term impairment where the word disability is used in the ICIDH and instead uses the term disability rather than the ICIDH use of the term handicap. The term handicap carries significant negative connotations and as such is not considered by the community of people with disabilities to be an appropriate means of describing disability. Impairment, according to DPI, is the functional limitation within the individual caused by physical, mental or sensory impairment, while disability is the loss or limitation of opportunities to take part in the normal life of the community on an equal level with others due to physical and social barriers (Oliver, 1996: 3). Disability is therefore defined as the disadvantage or restriction of activity caused by a social organisation which takes no or little account of people who have physical impairments and thus excludes them from the mainstream of social activities (Barnes & Mercer, 1992: 3; Oliver, 1996: 7).

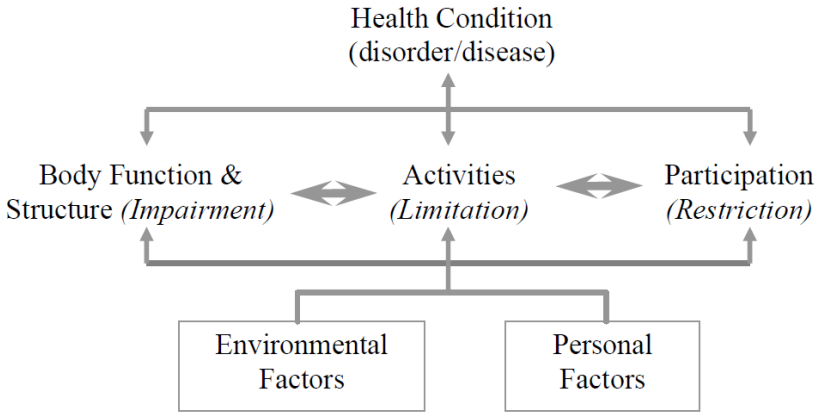
Despite being used as an umbrella term, the social model is not a singular definition or category of disability. It is a means of viewing disability in the context of how the individual person integrates with

their social environment and the role of society in creating disability unnecessarily through lack of reasonable accommodation. The definition of disability itself tends to be subjective. Views of disability have evolved over time, and have led to the development of interactional models. Interactional models are hybrid models that encompass elements of both the medical and social approach to examining and conceptualising disability such as the ICIDH-2 and the ICF model.

2.2.3 The WHO ICIDH-2 and ICF models

In 1999, as a result of the emergence of the social model, the ICIDH was replaced by the ICIDH-2 which consists of three stages of disablement: disease, impairment and activity limitations (disability). These are no longer considered to occur in a linear path (as per the original ICIDH model), but rather represent concurrent aspects of disability thus allowing for consideration of each within an individual's environmental context (Fujiura & Rutkowski-Kmitta, 2001). This is illustrated in Figure 2.2 below and is also used to illustrate the ICF model. The term handicap has been eliminated from this model. The premise of this ICIDH-2 model is such that it includes the possibility that someone may have an impairment but not be limited in their participation.

Figure 2.2: The ICIDH-2 and the ICF model



(World Health Organization, 2010)

The International Classification of Functioning (ICF) of 2001, also developed by the WHO succeeds the ICIDH-2 and combines the medical and social models to form a comprehensive model of disability. The ICF is essentially a framework for describing disability through the introduction of a standard language and conceptual basis for the measurement of disability (World Health Organization, 2010). The ICF framework, like the ICIDH-2, is not linear and recognises that an impairment, activity limitations and participation restrictions may be caused by a health condition or alternatively by the environmental or personal factors surrounding an individual (WHO, 2011). Impairments refer to problems in bodily function such as paralysis or blindness, activity limitations refer to difficulties

executing activities such as walking or eating, and participation restrictions refer to a lack of inclusion in societal norms (WHO, 2011). Disability refers to difficulty in any of these areas and results from the link between health conditions and circumstantial factors, both environmental and personal. This model therefore acknowledges that issues such as socioeconomic vulnerability may lead to disability. The ICF model refers to activity limitations and participation restrictions which addresses the lack of access to employment and earnings of an individual. Activity limitations and participation restrictions depend on health, environmental and personal factors.

It should be noted that numerous other models of disability exist, but the models discussed here are the most relevant and pertinent to the overall research objectives of this thesis. Some of the other disability models include the moral/religious model which predates the medical model, the identity model and the human rights model which are similar to the social model, the Nagi model and the capabilities approach to name a few (Nagi, 1991; Mitra, 2006; Rerief & Letšosa, 2018).

In terms of this thesis, it is important to establish a means of understanding disability in the context of economics. The medical model does not address any economic aspect as it purely deals with the individual person and how they are affected by an impairment or disability, with the goal being to treat or to rehabilitate. The social model begins to demonstrate how environmental factors and poverty can contribute to disability. In addition, it emphasises that if society provided reasonable accommodation, it would assist people with disabilities to be fully integrated into the workplace or society more generally. The combination approach as demonstrated by the ICF will therefore form the basis of the conceptualisation of disability in this thesis due to the comprehensive nature of the approach and the fact that the UN CRPD is based on the ICF model. In addition, the Washington Group questions used globally in national surveys are designed with the ICF framework as the foundation. Further detail regarding the Washington Group questions and consequent disability measures will be provided in chapter three.

2.3 Disability and socioeconomic vulnerability

The UN CRPD highlights the critical need to address issues relating to poverty and socioeconomic vulnerability, given that people with disabilities are typically more susceptible to such circumstances (United Nations, 2006). Disability is strongly associated with socioeconomic vulnerability by means of a two-way causal link: people with disabilities are more vulnerable to poorer socioeconomic outcomes, and those in poorer socioeconomic circumstances are predisposed to health issues or living conditions that can result in disability (Groce et al., 2011; Muderedzi & Loeb, 2011; Jan, Essue & Leeder, 2012; Schneider, Mokomane & Graham, 2016; Banks, Kuper & Polack, 2017; Pinilla-Roncancio, 2018). It is the poorest of the population who are at greatest risk of chronic disease (communicable or non-communicable) and disability, yet these individuals are the least able to cope with the economic

consequences that follow (Elwan, 1999; World Health Organization, 2005; Abegunde et al., 2007). It is also highly likely that, once individuals develop a disability, they will descend further into poorer socioeconomic circumstances due to their existing vulnerable living conditions and lack of economic opportunities (Groce et al., 2011; Loeb et al., 2011).

The extent of the relationship between socioeconomic vulnerabilities and disability can depend on the type of disability and the age at which it is acquired. Some studies have shown that people with intellectual disabilities are worse off in many ways in comparison to those with physical disabilities and this is particularly an issue for children of school going age (Groce et al., 2011). Discriminatory and vulnerability factors, such as gender and race and whether the person lives in an urban or rural area, also affect the extent to which having a disability might exacerbate socioeconomic vulnerability (Groce et al., 2011). In addition, the individual may face higher direct out-of-pocket costs such as those involving assistive devices, specialised transport and creating accessible homes (Hanass-Hancock et al., 2017). These costs depend on the type and severity of the disability.

The poor are exposed to more stress, unhealthy living conditions and higher levels of risky behaviour which increases their vulnerability to disability (World Health Organization, 2005). In both developed and developing countries, lower levels of education increases the likelihood of people engaging in and sustaining this risky behaviour. The main reason is that these individuals have fewer choices regarding consumption which can lead to malnutrition, inadequate housing, improper sanitation, inadequate transport and healthcare services, and fewer opportunities in terms of education and employment (World Health Organization, 2005; Mont, 2007; Filmer, 2008; Loeb et al., 2011; Mitra, Posarac & Vick, 2013b). Poverty can therefore lead to disability given that environmental and circumstantial factors can increase the likelihood of developing a disability.

The second causal link illustrates that people with disabilities tend to have lower levels of educational attainment, which in turn impacts on their potential labour market outcomes and consequently makes them socioeconomically vulnerable. Physical disabilities can also directly hamper access to the labour market in spite of their education if the disability is not accommodated in the workplace. In addition, institutional or attitudinal barriers can affect whether or not people with disabilities are absorbed by the labour market (Groce et al., 2011). It is this link from disability to socioeconomic outcomes that this thesis explores in later chapters, namely chapters four and five.

Multidimensional poverty as a measure of deprivation is beyond the scope of this study, but it features some common elements that will be covered in this thesis, such as education and employment. A study focusing on 15 developing countries indicates that people with disabilities are especially vulnerable to multidimensional poverty, but the areas of deprivation are specific to the country in which a person

resides or to the specific disability the person has (Mitra, Posarac & Vick, 2013a). A study on Latin America highlights that households are affected by higher degrees of multidimensional poverty if they have a person with disabilities living in the household (Pinilla-Roncancio, 2018).

In economics, it is widely recognised that decision-making, particularly as it pertains to labour market participation, occurs in conjunction with other household members (Becker, 1965a; Stabile & Allin, 2012). At the household level, the impact of disability may include the direct out-of-pocket costs associated with the medical intervention or assistance services required to treat or manage the disability. A person with disabilities might be viewed as having lower earnings potential compared to another household member without disabilities and therefore be discouraged from participating in the labour market. Alternatively, there may be indirect effects such as lost labour market opportunities for previous income earners who now face disabilities, or the withdrawal from the labour market of other household members who provide care for the household member with disabilities (Groce et al., 2011; Department of Social Development, 2015; Hanass-Hancock & McKenzie, 2017; Hanass-Hancock et al., 2017).

Opportunity costs at the level of the individual refer to lower educational attainment or lost employment opportunities or income that could have been earned if the person did not have a disability (Loeb, Eide & Mont, 2008; Mitra, Posarac & Vick, 2013b; Hanass-Hancock et al., 2017). At each level (education, labour market participation and earnings) these lost opportunities may lead to further opportunity costs. For example, if the person with disabilities is impacted in their educational attainment this will affect their labour market opportunities including their ability to earn an income. These reduced opportunities from lower educational attainment are further compounded because disability also can impact directly on employment opportunities and earnings. On a household level, opportunity costs refer to the caregiving that may be required and the additional loss of labour market earnings by the household member responsible for caregiving (Hanass-Hancock & McKenzie, 2017; Hanass-Hancock et al., 2017).

Prior to the emergence of the CRPD in 2007 and the call to create internationally standardised survey questions on disability, there was a notable variation in disability-specific survey questions in developing countries. The previous questions on disability were largely based on the medical model or ICIDH (1980). Consequently, the prevalence of disability has largely been underestimated for developing countries, at only one to two percent of the population using these surveys (Filmer, 2008). Despite these low prevalence numbers, studies have been able to identify certain correlations between disability and individual or household level factors. It is found that adults with disabilities are more likely to live in poorer households and to have lower levels of educational attainment (Filmer, 2008; Braathen & Loeb, 2011). Children with disabilities are also more likely to be out of school (Filmer,

2008; Mitra, Posarac & Vick, 2013b; Loyalka et al., 2014). The impact of disability in childhood is therefore likely to have long term economic consequences in terms of their future labour market opportunities due to the direct effect of educational attainment on labour market outcomes (Filmer, 2008; Stabile & Allin, 2012).

Households that have children are generally larger and therefore the household income needs to be divided amongst more people (Hall & Woolard, 2012). The household socioeconomic vulnerability is potentially worsened if a child requires care due to illness or disability. Stabile and Allin (2012) find that mothers of children with disabilities are less likely to work, particularly if the child is severely disabled. This implies that labour market participation of caregivers is negatively affected if there is a child with disability living in the home. There is also evidence of a strong negative relationship between disability and household income in China (Loyalka et al., 2014). This finding is based on a measure of disability using the medical model. Participants were first screened for any sign of physical, mental or sensory disability and were then assessed by a medical doctor for severity. This study acknowledges the limitations of the medical approach to measuring disability, which is a much narrower approach compared to the social model (Loyalka et al., 2014).

There is currently very little literature on the opportunity costs of caregiving relating to persons with disability. However, studies have shown that it is typically females that are tasked with caring for household members with disabilities (Loeb et al., 2011). The economics literature on caregiving has previously investigated the opportunity costs of providing childcare in general, and has shown that women with children have lower average earnings than women who do not have children (Waldfogel, 1997; Budig & England, 2001; Agüero & Marks, 2011). A key reason for the existence of the motherhood wage penalty is that childcare places certain daily constraints on the availability of a woman's time for market work. This may negatively impact on a mother's ability to perform well in certain jobs, therefore causing her to choose more flexible positions which may offer substantially lower wages (Budig & England, 2001). It is likely that providing care to persons with disability in the household may have similar consequences.

The following section 2.4 focuses on the relationship between disability and education, by discussing school attendance for children and the policies regarding inclusive education. Thereafter, Section 2.5 focuses on labour market outcomes for adults, including employment and earnings outcomes. The South African social security programme is also briefly discussed as it pertains to people with disabilities.

2.4 Education

Access to education and educational attainment are considered to be pertinent predictors of socioeconomic success (Braathen & Loeb, 2011). In light of the Millennium Development Goal of

Universal Primary Education, there is a concern that a considerable number of children, 100 million globally, remain out of school (Filmer, 2008; Lamichhane & Kawakatsu, 2015). Out of all children who are not attending school, over a third of them are children with disabilities and few children with disabilities who do attend are able to attend to completion (Peters, 2003; Filmer, 2008; Department of Social Development, 2015). Because these children are part of family units, it is estimated that at least 25 percent of the world population is directly affected by children with disabilities in their households. Globally, there are concerns that children with disabilities who are out of school will face worsening socio-economic outcomes, violence and chronic diseases (Peters, 2003).

School enrolment alone is not always a true reflection of progress in education for children with disabilities. It is also important to examine the quality of education and the support received by children enrolled in school (Lamichhane, 2013; Deghaye, 2021). Unfortunately there is a dearth of data available on inclusive education practices for children with disabilities in developing countries (Deghaye, 2021). Studies have found that regardless of impairment type, poverty, social stigma, parental attitude and a lack of awareness of support services are consistent barriers that affect access to education (Lamichhane, 2013). When a child is able to access schooling, problems exist in terms of the types of support or reasonable accommodation provided to meet the child's specific needs within the school environment which may affect educational progress (Lamichhane, 2013; Deghaye, 2021). In South Africa, there is a lack of resources to support the adoption of inclusive education both financially and in terms of teacher training and expertise (Deghaye, 2021).

Human capital theory suggests that there is a positive relationship between human capital investment and labour market earnings. Human capital refers to the productive capacity of an individual, and any investment of time and financial resources in education and vocational training is said to increase a person's productivity (Becker, 1962; Grossman, 1972). The most widely recognised forms of human capital are education, work experience and health (Becker, 1962). People are assumed to be born with a given 'stock of health' which is eroded over time as the individual ages or through illness or injury. However, through medical care and investment in general well-being, a person can positively impact on their health (Grossman, 1972).

Poorer households are exposed to harsher environmental factors which may cause or exacerbate certain health conditions. A person's health status can also impact on their ability to attain education. For example, children with a disability may have fewer opportunities to attain the same level of education as children without disabilities but with otherwise similar characteristics (Stabile & Allin, 2012). Negative health shocks may affect a person's decision to enter the labour market or, depending on when the health shock occurs, may cause people who were already participating in the labour market to exit temporarily or permanently. Non-participation and absenteeism in the labour market may reduce

earnings potential. Thus poor health or disability can have a long term negative effect on an individual's labour market outcomes (Johannsmeier, 2007; SADPD, 2012; Stabile & Allin, 2012; Mitra, Posarac & Vick, 2013b).

Returns to education, measured as the increase in earnings associated with attaining higher levels of education, offer an indication of the productivity of education and serve as an incentive to the investment in education (Becker, 1962; Psacharopoulos & Patrinos, 2004; Heckman, Lochner & Todd, 2013). Returns to education have been measured since the 1950s and demonstrate a pattern over time. It is found that lower income countries tend to have a higher rate of return to education compared to higher income countries. On the whole, the returns from tertiary education are the largest in low income countries. Returns to primary education tend to be larger for men while returns to secondary education are larger for women (Psacharopoulos & Patrinos, 2004). However, if people with disabilities are able to access education, their returns to education have been found to be at least two or three times higher compared to people without disabilities (Lamichhane & Kawakatsu, 2015). This highlights the value of education for people with disabilities and the potential impact on socioeconomic status.

In general, children in less developed countries suffer from poorer health and nutrition compared to those from wealthier countries. The consequences of poor health include reduced learning due to fewer years enrolled, lower daily attendance and less efficient learning per day spent in school (Glewwe & Miguel, 2008). Gross enrolment rates of 100 percent do not necessarily imply that all school-age children are in school. Both over-reporting and grade repetition can cause reported gross enrolment rates to reach or exceed 100 per cent even when some children never enrol in school (Glewwe & Miguel, 2008). The use of net enrolment rates is suggested as an alternative to account for the fact that people with disabilities may be behind in school. The net enrolment rate is calculated by dividing the total number of children enrolled in a particular level of schooling (who are of the age associated with that level of schooling) by all children of the age associated with that level of schooling. Net enrolment rates remove the upward bias in gross enrolment rates caused by the enrolment of 'overage' children in a given level (due to repetition or delayed enrolment) (Glewwe & Miguel, 2008). This may be particularly pertinent to studies involving children's health and education, given the tendency for absenteeism and/or an altogether lack of attendance in school. This particular issue has not been studied using nationally representative data on people with disabilities and as such one of the aims of this thesis is to investigate the progression of children with disabilities who are attending school compared to children without disabilities. This issue will be explored in chapter four.

Glewwe and Miguel (2008) posit that it is very challenging to generate reliable estimates of the relationship between child health and education, and cite two central problems in this regard. The first is omitted variable bias due to the fact that it is impossible to obtain data on all of the variables that

influence child education. Second, there may be attenuation bias caused by measurement error in the variables that can be measured. Both problems are very difficult to correct, but despite measurement difficulties, studies using cross-sectional data, panel data, or data from randomised evaluations find evidence to suggest that child health and education outcomes are linked. There is growing evidence of a causal impact of child health on education (Glewwe & Miguel, 2008). This consequently has implications for the impact of disability on education.

Children with disabilities in South Africa are more likely to be out of school compared to children without disabilities (Fleisch, Shindler & Perry, 2012; Department of Social Development, 2015). Other developing countries, namely India, Honduras, Namibia, Uganda and Bangladesh also find that children with disabilities are less likely to attend school compared to children with no disabilities (Groce et al., 2011; Lamichhane & Kawakatsu, 2015). In a study on living standards amongst people with disabilities conducted for Namibia, Malawi, Zimbabwe and Zambia, it is evident that people with disabilities are between two and three times more likely to be denied access to education (Loeb et al., 2011). School attendance is also impacted by a household's socioeconomic status whereby children with disabilities are less likely to attend school if their household is poor. There also appears to be a lack of household investment in education for children with disabilities given that it is perceived that children with disabilities will have lower returns to education compared to children without disabilities. It therefore may be necessary to offer incentives such as conditional cash transfers or scholarship programmes in order to address the economic well-being of the household and encourage school attendance (Lamichhane & Kawakatsu, 2015). The relationship between school attendance and disability discussed here may have severe economic implications over a child's lifespan and may lead to a perpetual cycle of vulnerability and poverty (Groce et al., 2011).

Even when school fees are not levied, school attendance may be unaffordable for poor households. In Malawi, no fees are required for children to attend primary school, but the cost of uniforms, stationery and books can often mean that schooling is unaffordable. In addition, schools can be inaccessible in terms of distance to the school and in terms of the nature of the buildings – a particular issue for children with disabilities (Braathen & Loeb, 2011). Malawi is considered one of the poorest countries and therefore has understandable difficulty in offering the required educational services to its population (Braathen & Loeb, 2011). However, this finding speaks to the fact that even when countries offer 'no fee schooling', there may be other financial or physical barriers to attendance which are likely to impact poor and vulnerable population groups specifically. Stigma and attitudinal barriers tend to impact educational attainment and school attendance for children with disabilities in Malawi. In addition, particularly when children attend mainstream schooling, a lack of assistive devices and general support hinders their experience (Braathen & Loeb, 2011).

In South Africa, the compulsory school-going age is seven to fifteen years (Department of Education, 1998), and the Department of Education reports a near 100 percent enrolment (Fleisch, Shindler & Perry, 2012). Nevertheless, certain groups of South African children that have not yet been reached by the schooling system include orphaned children, children living in rural areas and children with disabilities (Fleisch, Shindler & Perry, 2012). In rural KwaZulu-Natal, adults with a disability indicate that if their disability was onset during childhood their schooling was either very disrupted or was terminated early (Johannsmeier, 2007). In resource-poor areas of the Western and Eastern Cape a greater percentage of children aged 5 to 18 years with a disability have never attended school compared to children with no disability (Loeb, Eide & Mont, 2008) and additionally in Orange Farm, a rural area near Soweto, more than half of all children with disabilities had been denied access to education (Saloojee et al., 2007). One of the biggest issues facing children with disabilities and their families is a lack of information regarding the services necessary to support them and which of those are readily available to them in terms of rehabilitation services, assistive devices, schooling and social security grants (Sibanda, 2004a; Johannsmeier, 2007; Saloojee et al., 2007; SADPD, 2012).

Much of the research on disability and education in South Africa is based on small-scale studies that seek to identify some of the main problems in this area. However, there remains a need for a wide-scale surveillance study that identifies children with disabilities and their educational status. Historically, studies that examine disability data at a national level are limited by the survey questions available, namely questions that have been based on the medical model or ICIDH. However, they are able to illustrate the importance of conducting a more in-depth analysis. Based on data from Statistics South Africa's Community Survey of 2007, ten percent of children who were not attending school were children with a disability (Fleisch, Shindler & Perry, 2012). This particular survey is incomparable with other national household surveys given the sampling design employed (Statistics South Africa, 2007a). Using data from the Census 1996, children with disabilities were significantly more likely to drop out of primary school compared to children with no disabilities. Amongst other observable problems, disability seems to carry a stigma which exacerbates societal exclusion, particularly exclusion from education. Children with a disability who live in poverty are especially vulnerable to such marginalisation (Sibanda, 2004a; SADPD, 2012).

Currently, few studies investigate educational enrolment, progression and attainment at a national level using measures that are internationally comparable. The 2011 South African Census, which contains the more inclusive Washington Group short set of questions on disability, indicates that school attendance is particularly low amongst those with severe physical and communication difficulties. In addition people with severe disabilities generally have the lowest educational attainment (Department of Social Development, 2016). Another study estimates the marginal effects of disability on school attendance using the 2013 GHS in South Africa which also contain the WG-SS and find that children

with disabilities are more likely to be out of school (Mizunoya, Mitra & Yamasaki, 2016). The remaining gap in the literature is that none of these studies have used multiple measures of disability to establish the sensitivity of the relationship between disability and school attendance and none have examined progression through schooling for children with disabilities. There is also need to update the analysis given that these aforementioned studies are based on data that are 8 to 10 years old.

Inclusive education has been adopted as a global movement over the last 30 years to ensure quality mainstream education for all learners including those with disabilities and those from lower socioeconomic backgrounds (Engelbrecht et al., 2016). This is a mammoth undertaking that involves training of staff, adaptations of buildings and facilities as well as the removal of the stigma associated with the concept of disability (Dalton, Mckenzie & Kahonde, 2012). The UN CRPD outlines that children with disabilities should not be excluded from compulsory education based on their disability and that children should receive appropriate instruction that meets the needs of their disabilities (United Nations, 2006).

South Africa's policy on inclusive education, as outlined in the Education White Paper 6 of 2001, proposes that inclusive education and full-service schools will be implemented over a period of 20 years following 2001 (Nagrina & Majembe, 2001). The strategies outlined in the document include: the revision of age-grade norms for children with disabilities, early identification and assessment of disabilities, revision of the boarding and transport policies for schools, addressing the physical environment barriers that exist in ordinary schools, and capacity building for educators. In addition special schools are said to become resource centres that offer support to ordinary schools in terms of curriculum design, assessment and instruction (Nagrina & Majembe, 2001).

There is evidence of some implementation of inclusive education since 2011 (Lomofsky & Lazarus, 2001; Deghaye, 2021). This implementation includes capacity building projects that have been undertaken by government in low resource areas and the promotion of inclusion by NGOs. In addition, independent schools with more resources have been found to be able to start implementing inclusion usually with the support of facilitators provided by the parents of the children (Lomofsky & Lazarus, 2001). However, the resources are unevenly distributed across the provinces (Deghaye, 2021). Very little rigorous research exists on the extent to which any of the aforementioned strategies for inclusive education have been implemented over the past 20 years and studies that have looked into education in recent times have found that children with disabilities are disproportionately out of school, indicating that barriers to education still exist (Peters, 2003; Mizunoya, Mitra & Yamasaki, 2016; Luo et al., 2020; Deghaye, 2021). In addition, it is evident that the factors keeping children out of school are largely structural due to the lack of support offered to children with disabilities (Mizunoya, Mitra & Yamasaki, 2016; Luo et al., 2020). Ordinary schools in general still seem to lack the capacity to implement

inclusive education and are not receiving the support required to do so (Deghaye, 2021). There remains a need to ascertain, at a national level, the school attendance of children with disabilities and establish how they are progressing compared to their peers without disabilities.

The aforementioned research on education and disability has highlighted the disadvantage that people with disabilities face at the level of access to education. It is also evident that health or disability plays a vital role in terms of a person's ability to progress in their education. People with disabilities subsequently tend to have lower educational attainment compared to people without disabilities. Given that education raises a person's employability, by providing skills and indicating to prospective employers the individual's productivity and abilities, a lack of education is sure to hinder the labour market opportunities for people with disabilities. The next section will examine the existing literature on the labour market outcomes for people with disabilities.

2.5 The labour market

Legislation in various countries has taken strides to be inclusive of people with disabilities. The United Nations Convention on the Rights of Persons with Disabilities (CRPD) was adopted by the United Nations in 2006 and came into force in 2008 and has since been ratified by 182 nations including most African countries, the UK and other European countries but excluding the United States of America. The South African government ratified the CRPD in 2007. The CRPD "recognizes the right of persons with disabilities to work, on an equal basis with others; this includes the opportunity to gain a living by work freely chosen or accepted in a labour market and work environment that is open, inclusive and accessible to persons with disabilities" (WHO, 2011: 235). However, several studies have shown that the employment rates of people with disabilities are lower compared to people with no disability (Mitra, 2008; Mizunoya & Mitra, 2013b; Department of Social Development, 2015).

Prior to the ratification of the CRPD, the Disability Rights Charter of South Africa (1992) included a list of requirements as stipulated by people with disabilities in South Africa. These included non-discrimination in society, equal rights, mainstream schooling opportunities, employment opportunities and independence. Following the ratification of CRPD, the White Paper on the Rights of Persons with Disabilities (WPRPD) of 2016 was the first formal piece of documentation which, in accordance with the CRDP, outlines these elements in detail (Department of Social Development, 2016). The WPRPD defines people with disabilities as people who have perceived and/or actual physical, psychosocial, intellectual, neurological and/or sensory impairments which, as a result of various attitudinal, communication, physical and information barriers, are hindered in participating fully and effectively in society on an equal basis with others" (Department of Social Development, 2016).

In the WPRPD 2016, the South African government proposes that all individuals are equal before the law and that government policies and legislation across all socio-economic sectors should be inclusive of people with disabilities (Department of Social Development, 2016). Mainstreaming disability rights implies that there is no longer one specific policy to address disability rights but rather that all policies are inclusive and aim to address the imbalances and inequalities in all aspects of the lives of people with disabilities, thus shifting the focus and making it a human rights issue. This acknowledges that issues facing people with disabilities are complex and cannot be dealt with in a single policy plan (Department of Social Development, 2016).

Multiple factors at both the societal and individual level contribute towards the employment barriers experienced by people with disabilities (Levy & Hernandez, 2009). Generally speaking, race and gender are cited as a significant contributors to such barriers even within the population of people with disabilities (Levy & Hernandez, 2009). The WPRPD 2016 acknowledges the difficulties faced by children with disabilities in terms of their school attendance. People with disabilities also have a low absorption rate into the labour market and participation rates in particular are low.

Data from the 2013/14 Commission for Employment Equity Annual Report indicates that people with disabilities form less than one percent of the economically active population in South Africa (Department of Social Development, 2016). The distribution of employed people with disabilities tends to be weighted in favour of white people and those with vision impairments as opposed to African people or people with other types of disabilities including severe disabilities (Department of Social Development, 2016). This is particularly the case with top level management positions (Department of Social Development, 2016). Once again, issues around socioeconomic vulnerabilities are shown to affect people with disabilities. Using data from the 2011 Census, the WPRPD 2016 highlights that living conditions of people with disabilities are worse than for people with no disabilities. This is identified by the type of dwelling, access to electricity and water and basic services (Department of Social Development, 2016). People with disabilities also typically earn less compared to people without disabilities. This is particularly stark when comparing urban and rural areas (Johannsmeier, 2007; Department of Social Development, 2016)

In South Africa, a study estimates the relationship between disability and employment through logistic regression and finds that people with disabilities are less likely to be employed compared to people without disabilities (Graham, 2020). This was done using data from the first two waves of NIDS. A British study that focusses specifically on the labour market participation of men use a decomposition analysis to estimate the wage and employment differences between able bodied and disabled people, to determine the extent to which the differences between these two groups can be attributed to human capital and productivity differences. The findings suggest that men with disabilities are less likely to

participate in the labour market and when they do, they suffer from wage discrimination in the workplace (Kidd, Sloane & Ferko, 2000).

A study conducted in Ireland investigates the relationship between disability and labour force participation using two datasets (The Living in Ireland Survey 1995 - 2000 and a special module included in the Quarterly National Household Survey 2002). Overall the authors found that 11 to 16 percent of working age individuals report some type of disability and only 40% of these people are employed. The disability question in both surveys allows for some identification of the degree by which an individual is hampered in their daily activities (none, some and severely). They used both a cross sectional and panel analysis. In the cross sectional analysis using both surveys the results show that men with illness that affects their daily activities severely are 60 percent less likely to be economically active. The estimate for women is 40 percent. They also found a negative relationship between disability and labour force participation in the panel analysis (Gannon & Nolan, 2004).

Often, employment rates for persons with disabilities are low or declining despite legislation that seeks to protect the rights of such individuals (Mitra, 2008; Levy & Hernandez, 2009; Mitra, Posarac & Vick, 2013b). When the law dictates that employers provide reasonable accommodations to people with disabilities, the costs involved may hinder this process (Altman, 2005). In addition, it is not always accurate to assume that the population of people with disabilities are fully aware of the types of environmental barriers that hinder them in their daily lives (Altman, 2005). Therefore, it is important to be aware of these incongruences when implementing labour market policy decisions for people with disabilities.

Many studies on the association between disability and labour market outcomes in developing countries are very limited, and tend to take the form of cross-country comparison studies rather than in-depth investigations of a particular labour market. A key study by Mizunoya and Mitra (2013b) utilises the World Health Survey collected by the WHO between 2002 and 2003 to examine the relationship between disability and employment in 15 developing countries. These include seven African countries (Burkina Faso, Ghana, Kenya, Malawi, Mauritius, Zambia and Zimbabwe), four Asian Countries (Bangladesh, Laos, Pakistan and Philippines) and four in South America and the Caribbean (Brazil, Dominican Republic, Mexico and Paraguay). Most of these countries have ratified the CRPD and 11 of them have legislation pertaining to people with disabilities in their constitutions. The estimated prevalence of disability in each country varies substantially despite the same survey instrument being used, which is attributed to differences in age structures of the relevant populations and the translation of the surveys. In nine of these countries, people with disabilities have lower employment rates compared to people without disabilities (Mizunoya & Mitra, 2013b). However, this result is driven mainly by the finding for men. For women, gender tends to drive their employment status, rather than

their disability status itself. The evidence from these countries suggests that policies aimed at addressing access to employment are vital to ensuring the well-being of people with disabilities. This is particularly significant in middle income countries given the variances across countries; it is evident that there is no single policy that is suitable to every country's situation (Mizunoya & Mitra, 2013b).

A study on southern African countries including Namibia, Malawi, Zimbabwe and Zambia indicate that unemployment levels are high in general but in particular, people with disabilities are more likely to be unemployed compared to people without disabilities (Loeb et al., 2011). This once again points to the notion that people with disabilities are even more vulnerable in situations where living standards are already low. This study used Disabled Persons Organisations (DPOs) in each country to conduct a comparative analysis using the same survey questions (based on the ICF). They found there to be substantial gaps in service delivery particularly in the case of vocational training, welfare services, assistive device services and counselling. These shortcomings would undoubtedly contribute significantly to the barriers faced by people with disabilities, further exacerbating their difficulties.

The measurement of disability is inconsistent across different studies that estimate the relationship between disability and the labour market, although the authors of individual studies attempt to use comparable measures within the study when different countries are under investigation. The issues of differing survey questions and consequent different measures of disability within and across countries have until more recently been ubiquitous. Most studies recommend that future research seeks to standardise the approach in order to obtain comparable estimates (Altman, 2005; Filmer, 2008; Loeb et al., 2011). However, despite these disparities in measurement in existing studies, it is irrefutable that people with disabilities are worse off compared to people without disabilities in all facets of the labour market, in the acquisition of services and information as well as in general living conditions (Loeb et al., 2011).

This thesis therefore aims to fill the gaps in the literature by using a dataset that offers a standardised set of questions on disability (WG-SS) and analysing the labour market in a broader context. Firstly estimating the relationship between disability and labour market participation which has been done mainly using univariate analysis but also using older data in multivariate analysis (Mitra, 2008; Department of Social Development, 2015). This thesis will extend this work through multivariate analysis that uses more recent data (2011 to 2017). Secondly, the link between disability and employment will be explored using more recent data based on the WG-SS and lastly an analysis of earnings for people with disabilities compared to people without disabilities will be conducted. Other than univariate analysis, there has been no previous work on the earnings of people with disabilities in South Africa so this will be a novel addition to the existing literature.

One of the ways in which the South African government has provided assistance to people with disabilities and their caregivers is through the social security system. Grants may serve to buffer the costs experienced by both the individual and the household (Hanass-Hancock & McKenzie, 2017). Currently, the two types of grants relevant to people with disabilities are the disability grant and the care dependency grant. Historically, the first disability grant was instituted in 1937 and targeted white South Africans specifically (Kelly, 2013). The Disability Grants Act of 1946 made grants available to all race groups but in differing amounts such that white people received the most and black people the least. Black people were also subjected to more stringent criteria. From 1970 onwards, the racial differences in grant amounts were slowly reduced and then completely eradicated by the South African Social Assistance Act of 1992 (Kelly, 2013). This has since been replaced by the Social Assistance Act of 2004 which has seen various amendments over the years.

In order to qualify to receive the disability grant, a person should be between the ages of 18 and 59 and deemed medically unfit for work for a period of six months due to a physical, cognitive or sensory disability (Ferreira, 2014; Kelly, 2014; SASSA, 2016). Said person cannot be a recipient of any other social security grant and must not be cared for by an institution. The process of applying for the disability grant involves completing the relevant paper work, undergoing a medical examination and a means test to determine the value of the person's income and assets. If the person is single, they qualify for the disability grant only if their annual earnings are below R86 280 and they do not have assets more than R1 227 600, while if the person is married the spouses' combined earnings must not exceed R172 560 per annum and their assets must not be worth more than R2 455 200 (The South African Government, 2021a). The value of the disability grant is currently R1 860 per month. Once a person receiving the disability grant reaches the age of 60, they instead receive an older person's grant, which is currently valued at R1 890 for people between 60 and 75 years and R1 910 for people older than 75 years (The South African Government, 2021a).

The care dependency grant is designed to assist households with children with disability. A parent, caregiver or foster parent is eligible for this grant if the child (under 18 years of age) is permanently or severely disabled, again as assessed by a medical doctor, and is not being cared for by an institution. The grant stipulates that a single caregiver's income should not exceed R223 200 per year or R446 400 if the caregiver is married. The value of the care dependency grant is currently R1 890 per month (2021) (The South African Government, 2021b).

The implementation of these grants is problematic and has historically been fraught with complexity and difficulties. The non-financial criteria for eligibility are largely based on the medical approach to measuring disability, which can be somewhat limiting. Using the General Household Survey (GHS) 2005, Mitra (2010) demonstrates that there are problems with both inclusion and exclusion of people

with disabilities. Some individuals receive the grant when they perhaps should not, while others do not receive it when they should. In South Africa, qualitative research indicates that these grants are used mainly to fulfil basic household needs for food, schooling, water and electricity and are therefore not necessarily used directly to assist the person with the disability (Johannsmeier, 2007; Hanass-Hancock & McKenzie, 2017). This is perhaps indicative that despite the administration difficulties, government grant receipts play an important role in levelling out the differences in living standards of households with disabilities compared to households without (Loeb, Eide & Mont, 2008; Department of Social Development, 2015; Hanass-Hancock & McKenzie, 2017).

In South Africa, the disability grant is accessible to those who are considered unfit for work, thus if the value of the disability grant is greater than the potential labour market earnings, the individual may decide not to look for work (Johannsmeier, 2007; WHO, 2011). In rural KwaZulu-Natal, for example, people with disabilities are generally low-wage earners and tend to be hired on a temporary rather than permanent basis (Johannsmeier, 2007). The disability grant is therefore viewed as a more stable means of providing for their households, creating a disincentive for people to enter the labour market. The people interviewed for this study indicated that they face severe discrimination largely due to attitudinal barriers. Businesses are also largely inaccessible to people with disabilities and business owners are not willing to incur the costs of accommodating their disability. They also identified that there is a lack of public transport services suitable to people with disability. All of these reasons could explain the lower labour market participation rates of people with disabilities living in rural areas. The decision to participate in the labour market is impacted by barriers to accessing employment including discrimination, a lack of transportation and unsuitable workplace environments. With these complications facing people with disabilities, the possibility of a government social security grant may be more appealing than attempting to deal with these aforementioned difficulties thus encouraging labour market inactivity (WHO, 2011).

2.6 Concluding Comments

Disability has been conceptualised in a number of different ways, from a medical approach to a more comprehensive approach that takes into account the effect of the environment in which a person resides. The evolution of thought has been from the medical model, to the social model to combination approaches such as the ICIDH-2 and the ICF framework. The social model and combination approaches acknowledge that a person may have a disability that causes them to be in a wheelchair but with the necessary adjustments in terms of accessibility and reasonable accommodation, the person can function without limitations in education and the workplace (Barnes, 2009; World Health Organization, 2010). The CRPD 2007 is based on the ICF model and as such advocates for equality and civil rights for people with disabilities advocating for inclusion in education and the labour market.

It is evident that South Africa is determined to create a more equal society for people with disabilities. Currently, policy briefs such as the WPRPD and the Education White Paper on inclusive education highlight some ambitious goals and policies for people with disabilities. Little rigorous academic analysis has been conducted on the extent to which such polices are effective in practice, as measured by the outcomes experienced by people with disabilities in South Africa. Thus, this thesis seeks to provide evidence of the prevalence of disability in contemporary South Africa, and to establish the relationship between disability (as measured through national household surveys) and education and labour market outcomes.

This chapter has illustrated that internationally, in developed and developing countries alike, people with disabilities have lower levels of educational attainment and are less likely to participate in the labour market or to be employed compared to people without disabilities (Kidd, Sloane & Ferko, 2000; Mitra, Posarac & Vick, 2011; Mizunoya & Mitra, 2013a; Graham, 2020). Lower levels of educational attainment may arise from childhood and as such childhood disability can have long term economic consequences (Stabile & Allin, 2012). Education is widely recognised as a driver of employment and earnings and thus if schooling is affected due to a lack of access to schooling and reasonable accommodation in school, this will affect the person's socioeconomic status in the future.

Both the CRPD and the United Nation's Sustainable Development Goal for education advocate for inclusive and equitable quality education for all (United Nations, 2015). Whilst South Africa has established a guideline for the inclusion of children with disability in schools (Department of Basic Education (DBE), 2010), there is very little existing empirical evidence in South Africa that examines the association between school attendance and progression of children with disabilities. Studies that have examined school attendance for children with disabilities have done so either using outdated data or have limited the analysis to univariate analysis only (Fleisch, Shindler & Perry, 2012; Department of Social Development, 2015; Mizunoya, Mitra & Yamasaki, 2016; Deghaye, 2021). Ultimately, these studies do demonstrate that children with disabilities are disproportionately out of school.

The ICF model forms the foundation of the WG-SS which are designed to monitor the CRPD. The CRPD has been ratified by South Africa and therefore informs the South African WPRPD (United Nations, 2006; World Health Organization, 2010; Department of Social Development, 2016). As such, this will be the framework that will be used throughout the thesis, as it highlights the need for a focus on a person's full participation in society and thus the civil rights of people with disabilities rather than merely their medical diagnoses or health conditions.

The research that follows in chapters three, four and five is based on secondary data obtained from nationally representative household surveys and, where possible, will utilise multiple approaches to

measuring disability. Chapter three will investigate how various South African household surveys can be used to measure disability, and will estimate the prevalence of disability for children and adults. This contribution will provide a thorough indication of how disability questions in each household survey can be used to create measures of disability and show how prevalence estimates vary depending on the measures and surveys used. Chapter four extends the literature by examining the association between disability and school attendance and progression for children. Whilst there are a few studies that have looked at school attendance for children, they have mainly been based on univariate analysis. This thesis will provide a more up to date nuanced approach to the relationship between disability and school attendance due to the variety of disability measures used. The analysis of school progression is a novel contribution to the literature. Chapter five will interrogate the relationship between disability and overall educational attainment and labour market outcomes for adults. Labour market outcomes includes labour market participation, employment and earnings. The literature has identified a strong negative relationship between disability and employment but the South African literature is limited to an analysis of older data as well as data that does not include the WG-SS (e.g. NIDS). The analysis of educational attainment and earnings in South Africa is a new contribution to the South African disability literature.

Chapter Three

Measuring disability using household survey data

3.1 Introduction

As discussed in the literature review in chapter two, the conceptualisation of disability has evolved considerably over time through various models of disability. Prior to 1980, disability was largely understood through the medical model where disability was considered to be a condition of the individual alone. The social model of disability emerged thereafter in direct contrast to the medical model highlighting that the disability is not merely a medical condition but is itself imposed by society in the form of social and environmental barriers. These societal disabling effects include attitudinal barriers or stigma as well as a lack of reasonable accommodation. The chronology of these disability models and the conceptualisation of disability has understandably impacted the ways in which researchers and policymakers aim to measure disability empirically, and therefore the development of questions about disability that are used in household surveys. This chapter examines each of the relevant household surveys in South Africa with the view to measuring disability prevalence in the country.

In South Africa, the medical model has had a long-lasting role in the conceptualisation of disability. This is evidenced by the language used in household survey instruments and policy documentation in the country. The use of the word 'handicap' has long been considered problematic in the context of disability due to the negative connotations and the fact that it places the individual in the victim role. This outdated language remains in some survey questions in South Africa. The approach to disability in South Africa has largely followed the global conceptualisation of disability starting with the original ICIDH model. Surveys such as the population Census of 1996 and 2001 and the Community Survey 2007 reference the ICIDH as the basis for the questions on disability (Statistics South Africa, 2014a). The earlier versions of the General Household Survey (GHS 2002 – 2008) and the National Income Dynamics Study (NIDS) also finds its roots in this particular model based on the language used in the disability questions.

The Washington Group on Disability Statistics was created as a result of the 2001 United Nations International Seminar on the Measurement of Disability. This seminar identified the need for a good quality population-based measure of disability that is comparable within individual countries and across countries internationally (Group & Statistics, 2001; Washington Group on Disability Statistics, 2009; Madans, Loeb & Altman, 2011). One of the intentions behind this group was to create a tool to aid in the monitoring of the CRPD (Madans, Loeb & Altman, 2011). The WG-SS developed by the

Washington Group is based on the ICF model which is considered to be a multi-dimensional model recognising the connection between health, environmental and personal factors. The WG questions are therefore designed to measure whether people with disability participate in education, employment, their family and community to the same extent as people without disabilities. This matter of social participation and equal rights is the key foundation of the UNCRPD (United Nations, 2006; World Health Organization, 2010; Madans, Loeb & Altman, 2011). The WG short set of questions (WG-SS) has been incorporated into the South African population census since 2011, the GHS since 2009, the Community Survey of 2016 and the Demographic and Health Survey (DHS) of 2016. The data collected by these particular surveys therefore offer potential to make significant strides towards an improvement in the understanding of disability in South Africa.

In large-scale national surveys such as a population census or representative household surveys, it is not possible to determine every specific environmental or social impediment faced by people with disabilities, because these surveys are better suited to fulfilling a more universal purpose (Altman, 2014). It is simpler to identify and collect information on general measures of functioning, such as a mobility impairment, which can occur in a large number of conditions and injury (Altman, 2014). Large scale surveillance statistics on people with disabilities are useful in addressing civil rights issues as a whole, paving the way for policy to narrow down the focus to find the specific barriers that may require more attention (Altman, 2014). Currently, South Africa has incorporated only the short set of questions (six domains of functioning) developed by the Washington Group, yet there is also an extended set of questions that speaks to mental health and upper body impairments among others and a set that is designed specifically for children.[3] Whilst these have not yet been included in South African surveys, the results provided by the short set of questions will certainly assist in presenting an overview of disability in line with a civil rights approach which aims to compare the outcomes of people with and without disabilities.

To that end, there are three sub-objectives that will be addressed in this chapter:

i. Identify relevant South African household surveys which collect demographic and labour market information alongside appropriate disability-related questions.

ii. Demonstrate the link between the disability models and the survey questions and indicate ways in which disability can be measured.

[3] The WG-ES-F can be found in Appendix A3 and the Child Functioning model can be found in Appendix A4.

iii. Estimate the prevalence of disability in South Africa using these different measures and show the variation in prevalence estimates across household survey and measure.

The remainder of the chapter is structured as follows: first an overview of South African household surveys will be presented, illustrating the types of information collected by each. Following this, the survey questions are linked to the disability models and conceptualisation of disability, with discussion of how these questions can be utilised to measure disability prevalence. Once these measures are established, prevalence estimates will be presented for each survey demonstrating the similarities and differences across surveys and survey questions. Section 3.5 concludes this chapter.

3.2 South African household surveys

A substantial database of household surveys has been developed since the emergence of democracy in South Africa. Statistics South Africa (StatsSA) is the foremost institution that designs and conducts nationally representative household surveys in South Africa. These surveys include the national Census, the General Household Survey (GHS) and the Community Survey (CS). Other notable data-collection organisations include the South African Labour and Development Research Unit (SALDRU), who are responsible for the National Income Dynamics Study (NIDS) which is the first nationally representative panel study conducted in South Africa, and the Human Sciences Research Council (HSRC), who have conducted the annual South African Social Attitudes Survey (SASAS) since 2003. In addition, the Medical Research Council (MRC) administered the Demographic and Health Survey (DHS) in conjunction with StatsSA and the National Department of Health in 2016. Most of the aforementioned surveys are socioeconomic in nature, and tend to focus on issues relating to the labour market, health, education, general economic well-being and service delivery for a representative sample of the South African population.

The South African household surveys that collect demographic and labour market information alongside disability-related questions from 1996 to 2017 are identified in Table 3.1. It is acknowledged that the GHS has subsequently released data from the 2018, 2019 and 2020 surveys but due to delays in the release of data, 2017 was the most recent at the time of writing. Table 3.1 classifies the extent to which the elements of disability, education, labour market participation, employment and earnings are covered in each survey. The disability questions themselves will be discussed in more detail in section 3.3. As mentioned previously, StatsSA is responsible for the administration of the national Census. The Census aims to survey the full population of South Africa, and for this reason, the questionnaire is designed to be brief. The first post-apartheid Census was administered in 1996. All households in the country were enumerated, including those in a workers' hostel, student residence, residential hotel or home for the independent aged (Statistics South Africa, 2001). Only the main questionnaire is viable

for an analysis of people with disabilities as unfortunately, despite there being a separate questionnaire for people living in hospitals or institutions, no disability questions were administered to these individuals in particular. The earlier versions of the Census, namely 1996 and 2001, collect limited information on disability, education and the labour market whereas the most recent version (2011) has evolved on all fronts to collect more detailed information in these areas. The exception is with regards to earnings, which for the 2011 Census is only collected using income categories as opposed to actual income values. A ten percent sample of the Census data is available to researchers for analysis.

Table 3.1: An Overview of South African Household Surveys containing disability questions, 1996 to 2017

Survey	Year	Sample Size	Disability	Education	Labour Market Participation	Employment	Earnings
Census (StatsSA)	***1996***	10% of 40.6 mill individuals	Yes or No Limited Type	Attending Attainment	Limited	Limited	Categories
	2001	10% of 44.8 mill individuals	Yes or No Type	Attending Attainment	Limited	Limited	Categories
	2011	10% of 51.7 mill individuals	WG-SS	Detailed	Detailed	Detailed	Categories
Community Survey (StatsSA)	***2007***	238 067 hh*	Yes or No Type Severity	Detailed	Detailed	Detailed	Categories
	2016	1 370 809 hh*	WG-SS	Detailed	Detailed	Detailed	Categories
GHS (StatsSA)	***2008***	24 293 hh*	Yes or No Type	Detailed	Detailed	Detailed	Categories Specific values
	2009	25361 hh*	WG-SS	Detailed	Detailed	Detailed	Categories Specific values
	2010	25653 hh*	WG-SS	Detailed	Detailed	Detailed	Categories Specific values
	2011	25653 hh*	Yes or No WG-SS	Detailed	Detailed	Detailed	Categories Specific values
	2012 -2017	21000 – 25000 hh*	WG-SS	Detailed	Detailed	Detailed	Categories Specific values
DHS *(StatsSA, MRC, DoH)*	***2016***	11083 hh*	WG-SS	Attending Attainment	Limited	Limited	None
NIDS *(SALDRU)*	***2008***	7296 hh*	Activities of Daily Living. Specific Questions on vision and hearing. General illness or disability question.	Detailed	Detailed	Detailed	Categories Specific values

Source: Author's classification. Note: * refers to the number of households. Only the 2008 NIDS survey is used here but it is acknowledged that the NIDS extends from 2008 to 2017 and that the questionnaire remains unchanged.

The Community Survey was introduced by Statistics South Africa as an interim survey when the Census survey became decennial after 2001. The survey was conducted in 2007 and again in 2016. The CS was intended to provide data from the district and municipal levels to the national level, build capacity for the Census 2011, and provide the base for population projections (Statistics South Africa, 2007a, 2016a). The disability questions in the 2007 CS are broader than the questions in the first two Census surveys but are still somewhat limited as will be discussed in section 3.3.2. It should also be noted that the unemployment rates determined by the CS 2007 are considered less reliable and not comparable to other household surveys (Statistics South Africa, 2007b). In addition, the CS 2007 did not use a representative sample and users are cautioned that smaller populations are subject to under or over reporting as a result (Statistics South Africa, 2007b). CS 2016 incorporated the WG-SS into the survey instrument, making the disability questions directly comparable to the Census 2011, the Demographic and Health Survey and the General Household Surveys (GHS) from 2009 onwards. The labour market questions are also more extensive in the CS 2016 than in 2007 and include a number of comparable questions to the GHS. In addition, the sample used in 2016 was more representative compared to 2007.

The General Household Survey (GHS) is an annual survey initiated in 2002 as a tool to determine the living conditions of households, in order to examine and monitor service delivery in South Africa ((Statistics South Africa, 2012a). Although the survey is conducted annually, StatsSA do not survey the same households each year and thus individuals themselves are not tracked over time. Each survey is therefore an annual cross-section rather than a contribution to a panel study. From 2002 to 2008, the GHS used a simple question on disability akin to that used in the Census 2001. Since 2009, the GHS has incorporated the WG-SS into the questionnaire, becoming the first survey in South Africa to do so following the ratification of the CRPD. The GHS also collects detailed data on labour market activities and earnings making it an excellent source with which to analyse childhood and adult disability and their links to education and labour market activities. Whilst all of the GHS surveys collect detailed information on labour market activities, the 2009 and 2010 questions are not directly comparable with the later surveys due to changes in the questions on labour market activities.

The sample design of the GHS from 2011 to 2014 was based on a 2008 master sample that was created for a number of other household surveys in South Africa including the QLFS (Statistics South Africa, 2009, 2010, 2011, 2012b, 2013, 2014b, 2015, 2016b, 2017). The master sample used a two-stage stratified design whereby primary stratification occurred at the metropolitan area level and secondary stratification used variables such as household size, education, occupancy status, gender, industry and income. From 2015 onwards, the GHS sample design was based on the 2013 master sample which was developed for use by all household surveys based on the Census 2011 (Statistics South Africa, 2009, 2010, 2011, 2012b, 2013, 2014b, 2015, 2016b, 2017). This 2013 master sample was slightly larger compared to the 2008 master sample and still uses a two-stage stratified design. The final sample size

of the GHS based on the number of face-to-face interviews is approximately 25 000 households each year from 2009 to 2014, and thereafter from 2015 to 2017 it is approximately 21 000 (Statistics South Africa, 2009, 2010, 2011, 2012b, 2013, 2014b, 2015, 2016b, 2017). The Census 2011 and Community Survey 2016 have a larger overall sample size than the GHS and both also use the WG-SS, but both the Census 2011 and CS 2016 have fewer details on education and the labour market in comparison to the GHS. As mentioned, the GHS 2017 was the most recent GHS dataset available at the time of analysis for this thesis, and there have since been three additional years of the GHS made available.

The Demographic and Health Survey (DHS) aims to collect information on a variety of health indicators in the country. It is an internationally comparable survey intended to monitor the progress of the country with regards to the National Development Plan and the UN Sustainable Development Goals as they pertain to health (Statistics South Africa et al., 2019). The DHS 2016 is the most recent version and is the only one of the South African DHS surveys to incorporate the WG-SS on disability. The survey asks select questions regarding education and labour market activities but these are limited in comparison to other surveys that utilise the WG-SS. The DHS 2016 does not collect any information on earnings from employment. This survey is therefore best suited for an analysis of disability alongside other health indicators but is not suited to a study such as this thesis which aims to examine the role of disability in the labour market.

Finally, the National Income Dynamics Study (NIDS) is a national panel survey administered by SALDRU. Five waves of data have been collected to date, at roughly two-yearly intervals. The NIDS began in 2008 using a sample of 28 000 individuals in more than 7 000 households (SALDRU, 2016). The sample size in later waves varies due to sample attrition and replacement. The survey collects very detailed information about education and labour market activities. However, the disability questions are not universally used and some of the questions use language that is based on the medical model of conceptualising disability as a handicap. This is problematic from the perspective of the progress that has been made globally to be inclusive of people with disabilities and to utilise language that is without stigma. This survey remains useful for an analysis of disability when the research problem requires panel data, but other surveys that use the universal WG-SS are better suited to monitor the progress towards to goals of the CRPD in the country. Therefore, to demonstrate how this survey can be used to measure disability, only the first wave will be used as the survey questions have not changed over the waves thus making this overview applicable to all waves thereafter.

As discussed in chapter two, disability has been conceptualised in a variety of ways, and the questions used to capture information on disability in these household surveys reflect several of these conceptualisations. This section examines four surveys: the Census, the Community Survey, the General Household Survey and the National Income Dynamics Study to show how disability can be

measured using each of these surveys and how the variation in the survey questions alters the identification of the population of people with disabilities in the prevalence estimates that follow. As outlined previously, although all of these surveys contain questions pertaining to disability, the questions differ across each survey and in some cases have evolved over time, hence in some cases multiple survey years will be used to demonstrate these changes.

3.3 Measuring Disability

When estimating disability prevalence, a broader measure of disability as done through national surveys is typically used for civil rights purposes whereas a more specific disability measure such as that done through clinical diagnosis is used for benefit programmes. National household surveys fulfil a more generalised purpose pertaining to issues around civil rights rather than identifying specific diagnostic conditions (Altman, (2014). Not all people with disabilities have been diagnosed with a medical condition and not all of those with medical conditions have a disability. If the purpose of research is surveillance, it is best not to identify disability based on medical diagnoses alone.

The following section will explore each survey's question/s on disability to determine the measures of disability that can be constructed with each question set. For the purposes of this thesis, six measures of disability have been utilised, namely 'basic', 'broad', 'moderate', 'severe', 'UN' and 'multiple'. In addition, where available, the disability types have also been singled out. The basic measure refers to a limited question (usually binary: yes or no) on disability which is usually based on the medical model or ICIDH and requires the respondent to self-identify as having a disability. The broad measure encapsulates any disability, whether moderate or severe. Some studies have used a broad measure to capture as many individuals with disabilities as possible for surveillance purposes. The moderate and severe measures are based on there being a scale of severity of disability in the surveys. The thesis separates out the two from the broad measure to isolate the two levels of severity for the purposes of the multivariate analysis that follows in chapters four and five. The UN measure is specific to the Washington Group questions whereby someone has at least one severe or two or more moderate disabilities. This measure is used by the UN and has been used by StatsSA. Finally, multiple refers to any indication of more than one disability type, regardless of severity. The use of a variety of measures is recommended by the WG as the best use of the WG-SS. This will also allow for a more nuanced analysis of disability such that it is possible to establish whether certain groups of people with disabilities are more disadvantaged in certain areas compared to others.

3.3.1 The Evolution of the Census (1996 to 2011)

The first two Census surveys (1996 and 2001) were designed with questions on disability that are rooted in the WHO ICIDH definition of 1980: "disability is a physical or mental handicap which has lasted for

six months or more, or is expected to last at least six months, which prevents the person from carrying out daily activities independently, or from participating fully in educational, economic or social activities" (Statistics South Africa, 2014a: 14). Enumerators were encouraged to read out this to respondents when asking the question about whether or not they have a disability. As mentioned previously, the use of the word handicap in defining disability stems from the old paradigm of conceptualising disability (medical model) and carries negative connotations and stigma. Stigmatic language serves as a barrier to inclusivity and may cause people with disabilities to be less inclined to respond to questions out of fear of marginalisation. The Census 2011 includes the WG-SS which were developed as an equalisation of opportunity measure intended to monitor the CRPD (Madans, Loeb & Altman, 2011). The WG uses the ICF as the foundation for the questions: "The ICF conceptualises a person's level of functioning as a dynamic interaction between her or his health conditions, environmental factors, and personal factors. It is a biopsychosocial model of disability, based on an integration of the social and medical models of disability" (World Health Organization, 2010: 2). The Census 2011 questions are thus comparable with the GHS surveys from 2009 onwards, the 2016 CS and 2016 DHS in South Africa, as well as being internationally comparable with other countries that use the WG questions in their census or household surveys.

Both the 1996 and 2001 questions are presented below in Box 3.1 and 3.2 respectively. The 1996 question is a more limited question compared to the 2001 question which offers more options with regards to disability types. The 1996 question simply asks if a person has a serious sight, hearing, physical or mental disability. There is a yes or no option and then they can indicate which of the four options applies to them. The 1996 question itself does not reference matters of participation in activities of daily life whilst the 2001 does. In the 1996 survey, interviewers were instructed to offer respondents some assistance in answering this question but it was ultimately up to the respondent as to whether they felt their disability was serious or not. A suggestion was to explain that a serious disability prevents the person from performing normal activities of daily living such as washing, dressing or working without assistance or equipment.

The 2001 question is worded differently in that it asked whether the disability prevented full participation in activities. The options for disability type were more detailed in description and rather than 'mental' disability it referred to 'intellectual' and 'communication'. However, according to StatsSA (2014a) the prevalence of disability decreased from 1996 to 2001 and focus groups identified that the phrase 'prevents full participation' tended to exclude people who had functional limitations such as sight or physical disabilities but who were nonetheless able to participate in life activities. Users of the Census 2001 are therefore cautioned that disability prevalence estimates should be considered a rough indication and not a true estimate of disability in the country.

Box 3.1: Census 1996 questions

13. Does (the person) have a serious sight, hearing, physical or mental disability?	*1 = Yes or 2 = No*
(if "Yes") Circle all applicable disabilities for the person	*1 = Sight (serious eye defects)* *2 = Hearing/speech* *3 = Physical disability (e.g. paralysis)* *4 = Mental disability*

Source: Census 1996

Box 3.2: Census 2001 questions

P.13. Does (the person) have any serious disability that prevents his/her full participation in life activities (such as education, work, social life)?	*0 = None* *1 = Sight (blind/severe visual limitation)* *2 = Hearing (deaf, profoundly hard of hearing)* *3 = Communication (speech impairment)* *4 = Physical (e.g. needs wheelchair, crutches or prosthesis; limb, hand usage limitations)* *5 = Intellectual (serious difficulties in learning)* *6 = Emotional (behavioural, psychological)*

Source: Census 2001

Using these survey questions, disability measures are constructed as dummy variables. In each case if the person indicates having any disability based on the given measures, they are assigned the value 1 and 0 otherwise. Each disability type as captured by the survey question is also created as a dummy variable. There is no indication of varying degrees of severity of disability in either the 1996 or 2001 Census.

Table 3.2: Disability Measures using the Census 1996 and 2001

Disability Measure	1996	2001
Basic	If a person answered yes they are counted as having a disability.	If a person identified any one of the types listed, they are counted as having a disability.
Multiple	If answered more than 1 type	If answered more than 1 type
Sight	1	1
Hearing	2	2
Physical	3	4
Cognitive	4	5
Communication	-	3
Emotional	-	6

Source: Author's classification. Note: Table 3.2 is based on Box 3.1 and 3.2. The numbers 1 to 6 refer to the survey classifications of the disability types. The order of each disability type differed slightly in each survey and additional options were available in the 2001 survey that were not in the 1996 survey.

As indicated in Table 3.2 both the 1996 and 2001 Censuses ask a general question about whether or not someone has a disability. Given that in each case, the question is fairly simple and lacks any detail regarding severity, a yes response to this question places a person in the basic measure of disability. As mentioned, the basic measure of disability refers to any question that does not capture the nuances of disability and that tends to stem from the medical model or original ICIDH. For each survey, the respondent is allowed to provide more than one disability type and thus it is also possible to capture a measure of multiple disabilities in both of these surveys. The 1996 identifies fewer disability types than the 2001 Census which includes the addition of emotional and communication difficulties. This thesis has chosen to use the term cognitive impairments to describe any intellectual disabilities or difficulties remembering or concentrating thus individuals who report mental disabilities in the 1996 survey and those who report intellectual disabilities in 2001 are described by the measure labelled 'cognitive' illustrated in Table 3.1 above.

The 2011 Census question is replicated in Box 3.3 below. As mentioned above, this is the WG-SS and focuses on six domains of functioning. For each domain, respondents are required to indicate their level of difficulty from 'none' to 'cannot do at all'. This is the first time that a South African Census question offered an opportunity for respondents to indicate the severity of their disability. In addition, the language used is more inclusive and does not carry the stigma associated with the language previously used to discuss disability or functional impairments. The Washington Group stipulates to all users of their survey questions that they should use a variety of different combinations of these questions to formulate measures of disability (Washington Group on Disability Statistics, 2009; United Nations, 2014b). This is possible given the manner in which the question is constructed whereby there is a separate line of questioning for each domain of functioning. The following measures have been

constructed for this study: broad, moderate, severe, UN and multiple. In addition, there are six disability types captured by the question: sight, hearing, physical, communication, cognitive, self-care and each of these are used as individual disability types. It should be noted that the WG questions combine remembering and concentrating into one domain of functioning but in the Census 2011, these are presented separately. For the purposes of this thesis, they have been combined to reflect overall cognitive difficulties.

Box 3.3: Census 2011 questions

P.12. Does ... have difficulty in doing any of the following?	
a. Seeing (even with glasses if he/she wears them)	*1 = No difficulty*
b. Hearing (even with a hearing aid, if he/she wears one)	*2 = Some difficulty*
c. Walking a kilometre or climbing a flight of steps	*3 = A lot of difficulty*
d. Remembering	*4 = Cannot do at all*
e. Concentrating	*5 = Do not know*
f. With self-care, such as washing or dressing	*6 = Cannot yet be determined*
g. In communicating in his/her usual language including sign language (understanding others and being understood by others)	

Source: Census 2011

Table 3.3: Measures of disability using the WG-SS

Measure	Criteria	
Broad	Answered 2, 3 or 4 to any one of the domains of functioning	
Moderate	Answered 2 to any one of the domains of functioning	
Severe	Answered 3 or 4 to any one of the domains of functioning	
UN	Answered 3 or 4 to at least one domain or answered 2 to two or more domains	
Multiple	Answered 2, 3 or 4 to two or more domains	
	Disability Types:	
Sight	Moderate: a2	Severe: a3 or a4
Hearing	Moderate: b2	Severe: b3 or b4
Physical	Moderate: c2	Severe: c3 or c4
Cognitive	Moderate: d/e2	Severe: d/e3 or d/e4
Communication	Moderate: f2	Severe: f3 or f4
Self-Care	Moderate: g2	Severe: g3 or g4

Source: Author's Classifications

Table 3.3 above illustrates the manner in which each measure of disability is created using the WG-SS in the Census 2011. In each instance, a dummy variable is created where the variable is equal to 1 if the stated conditions are met and zero if not met. If people report that they do not know, they are excluded from the measure. The following presents an example of the construction of these measures: for a person

to be considered as having a moderate disability, they would have answered 'some difficulty' to at least one of the six domains of functioning. If they answered 'some difficulty' to two or more domains or 'a lot of difficulty' or 'cannot do at all' to at least one, they would be considered to have a disability according to the UN measure. A person who cites that they have some difficulty seeing, would be assigned to the moderate sight disability measure, whereas if a person cites having a lot of difficulty or being unable to communicate, they would be considered to have a severe communication disability. It must be noted that the WG-SS allows respondents to identify more than one functional limitation and thus when creating the individual disability type indicators, there may for example be people who are counted in the group with severe sight difficulties as well as in the group with moderate communication difficulties. Note that the 2011 survey does not contain a basic measure of disability, but this is not viewed negatively because the measures that can be constructed with this survey allow for a more nuanced overview of disability than that offered by a basic measure of disability. This also lessens the potential under-reporting of disability which may result due to stigma from a question that requires someone to self-identify as having a disability.

3.3.2 The Community Survey

The 2007 version of the Community Survey included a combination of the questions from both the Census 1996 and 2001 as can be seen in Box 3.4 below. This combination of questions therefore remains based on the medical model and the revised ICIDH (1993) where there is acknowledgement of disability being a function of not being able to participate fully in work, education and social activities. The first question P21 allows for the basic measure of disability. Question P22 asks about the type of disability and thus if a person reports more than one type, they will be included in the multiple measure of disability. The final question P23 which asks whether the disability seriously prevents a person from full participation allows for an indication of whether the disability is severe or not. The disability types identified in this question include sight, hearing and communication, physical, cognitive and emotional.

Box 3.4: Community Survey 2007 questions

P21 Does (the person) have any kind of disability?	*1=Yes* *2=No* *3=Do not know*
P22 What type(s) of disability does (the person) have?	*1=Sight (blind/severe visual limitation* *2=Hearing (deaf, profoundly hard of hearing)* *3=Communication (speech impairment)* *4=Physical (needs wheelchair, crutches, etc.)* *5=Intellectual (serious difficulties in learning)* *6=Emotional (behavioural, psychological)*
P23 Does the disability seriously prevent (the person) from full participation in life activities (such as education, work, social life, etc.)?	*1=Yes* *2=No*

Source: Community Survey 2007

The basic measure of disability is a dummy variable equal to one if someone responds yes to the question P21 asking if they have any kind of disability. Multiple disabilities equals one if a person reports more than one disability type in question P22. For each of the disability types captured by P22, a dummy variable is assigned the value of one if the person reports that specific type and zero otherwise. The third and final question P23 asks whether the disability prevents full participation in life activities, which is used to capture whether the person has a severe disability.

The WG-SS are introduced in the CS 2016 and therefore the same disability measures indicated for the Census 2011 are constructed here too. The question is presented slightly differently to the Census 2011 whereby the Census separated out the domain of remembering and concentrating into two separate options whilst the CS 2016 combined the two. However, for the disability measures used in this thesis, remembering and concentrating have been combined under the heading 'cognitive' in the case of all surveys using the WG-SS and the measures are therefore directly comparable.

Box 3.5: Community Survey 2016 questions

Q3.7.3. Does ... have difficulty in doing any of the following?	
a. Seeing (even with glasses if he/she wears them)	*1 = No difficulty*
b. Hearing (even with a hearing aid, if he/she wears one)	*2 = Some difficulty*
c. Walking a kilometre or climbing a flight of steps	*3 = A lot of difficulty*
d. Remembering or Concentrating	*4 = Cannot do at all*
f. With self-care, such as washing or dressing	*5 = Do not know*
g. In communicating in his/her usual language including sign language (understanding others and being understood by others)	

Source: Community Survey 2016

3.3.3 The General Household Survey

Prior to 2009, the GHS was limited to two specific questions where one asks whether a person is limited in their daily activities due to a particular condition (Q1.28) and the other asks about the type of difficulty they have (Q1.29). Based on these questions, the basic and multiple measures of disability can be used along with the individual disability types: sight, hearing, physical, communication, cognitive and emotional. The GHS altered the disability questions in 2009 by incorporating the WG-SS, becoming the first nationally representative survey in South Africa to do so. The measures that can be constructed with the GHS from 2009 onwards are the same as those discussed for the Census 2011 and CS 2016 above. The only difference is that the GHS 2011 reintroduced the previous disability question from 2008 and earlier (Q1.28) thus allowing for the basic measure in this survey alongside the WG measures. This allows for a direct comparison between the old disability measures and the new measures afforded by the WG-SS in this one specific year of the GHS (2011).

Box 3.6: General Household Survey 2008 and earlier questions

Q1.28 Is […….] limited in his/her daily activities, at home, at work or at school, because of a long-term physical, sensory, hearing, intellectual, or psychological condition, lasting six months or more? {yes or no}	
Q1.29 What difficulty or difficulties does […..] have? Is it Sight, Hearing, Communicating, Physical, Intellectual, Emotional, Other.	

Source: GHS 2008

Box 3.7: General Household Survey 2009 to 2017 questions

Does ... have difficulty in doing any of the following? *a. Seeing (even with glasses if he/she wears them)* *b. Hearing (even with a hearing aid, if he/she wears one)* *c. Walking a kilometre or climbing a flight of steps* *d. Remembering or Concentrating* *f. With self-care, such as washing or dressing* *g. In communicating in his/her usual language including sign language (understanding others and being understood by others)*	*1 = No difficulty* *2 = Some difficulty* *3 = A lot of difficulty* *4 = Cannot do at all* *5 = Do not know*

Source: GHS 2009 to 2017

3.3.4 The National Income Dynamics Study 2008

The NIDS has a very different approach to disability questions compared to the StatsSA survey instruments discussed above. In addition, the NIDS has two different questionnaires one for adults (ages 15 and older) and for children and as such the disability measures differ in each case. There is a basic measure of disability in QJ17 where a person is asked whether they have a major illness or disability other than hypertension, diabetes, stroke, asthma, heart problems and cancer. This is a very general question given that it refers to both illness and disability. Illness can lead to disability and vice versa however, this question is still binary in nature (yes or no) and therefore can be used as a basic measure of disability. The basic measure is common to both the adult and child questionnaires. The follow up question asks the respondent to indicate which illness or disability the person has, where the options include: physically handicapped, problems with sight, hearing or speech, psychological or psychiatric disorder among other chronic diseases. The use of handicap in the questionnaire is problematic due to the negative connotations associated with the word.

Box 3.8: National Income Dynamics Study 2008 questions

QJ17. Do you have any other major illness or disability not mentioned above *(Illnesses mentioned previously include TB, High Blood Pressure, Diabetes, High Blood Sugar, Stroke, Asthma, Heart problems, Cancer).*	*1=Yes* *2=No* *3=Do not know*
QJ18. If answer yes, what are they?	*1=Physically handicapped* *2=Problems with sight, hearing or speech* *3=Psychological or psychiatric disorder* *4=HIV/AIDS* *5=Epilepsy* *6=Emphysema* *7=Alzheimers* *8=Other*
QJ19. Do you use spectacles, glasses, or contact lenses, including for reading?	*Yes or No*
QJ20. When was your vision last tested?	
QJ21. How is your vision? *If you wear glasses, how is your vision with your glasses?*	*1=Excellent* *2=Very good* *3=Good* *4=Fair* *5=Poor* *6=Blind*
QJ22. Do you use a hearing aid?	*Yes or No*
QJ23. How is your hearing? *If you use a hearing aid how is your hearing with the hearing aid?*	*1=Excellent* *2=Very good* *3=Good* *4=Fair* *5=Poor* *6=Deaf*
QJ24. Now we would like to know what level of difficulty you have in carrying out the following activities by yourself. I am going to read out a list of activities. Using the show card, please indicate the level of difficulty you have with each activity. *1=No difficulty* *2=Difficult, but can do with no help* *3=Can do, only with help* *4=Can't do* *5=Able to, but never do*	*1=Dressing* *2=Bathing* *3=Eating* *4=Toiletting* *5=Taking a bus, taxi or train by yourself* *6=Doing light work in or around the house (if you had to)* *7=Managing money (if you had to)* *8=Climbing a flight of stairs (if you had to)* *9=Lifting or carrying heavy objects (e.g. a bag weighing 5 kg)* *10=Walking 200-300 meters* *11=Cooking for yourself (if you had to)*

Source: NIDS 2008

The NIDS adult questionnaire also includes the questions J21 and J23, where respondents report the quality of their vision and hearing, and a series of sub-questions on the activities of daily living in J24. These offer a scale of difficulty for people to report their difficulties with sight, hearing, physical (walking, climbing stairs, lifting/carrying) and self-care (dressing, toileting, eating and bathing). Dummy variables are created for moderate and severe difficulties with the aforementioned disability types. Moderate refers to people reporting their sight and hearing as fair while severe refers to those reporting these as poor or deaf/blind. For the physical and self-care variables that stem from the 'activities of daily living' (ADL), a person reporting option 2 (difficulty but can do without help) are captured by the moderate measure and people reporting 3 (can only do with help) or 4 (can't do) are assigned to the severe measure of disability. Each disability type is created as a dummy variable for the moderate version and a dummy variable for the severe version. Thereafter each of the moderate variables are combined into an overall moderate measure and the severe variables are combined into an overall severe measure. The UN measure is also possible by identifying people with at least one severe or two or more moderate disabilities. The multiple variable refers to people who have reported two or more of any type of disability. The activities of daily living measures are available only in the adult survey making the child questionnaire very limited in its usefulness for disability analysis.

The NIDS adult questionnaire therefore provides the same categories as the Census 2011, GHS 2009 – 2017 and CS 2016; however, the manner in which each disability type is captured in the questionnaire is inconsistent within the NIDS whereas the same standardised WG-SS is the basis of the StatsSA surveys. In the NIDS specifically, the scale of difficulty differs for the sight and hearing questions compared to the physical and self-care questions. The NIDS child questionnaire is limited to the basic measure, although it also captures whether a child was born with the disability or not. This question is useful in and of itself because none of the other surveys include such a question. However, the basic measure is not suitable as a stand-alone measure of disability prevalence among children. It is for these reasons that the NIDS is not suitable for the analysis required in this thesis.

Finally, it must be noted that the Demographic and Health Survey of 2016 also includes the WG-SS and thus the same measures identified in Table 3.2 can be constructed with this survey. However, given that the DHS 2016 is limited in terms of the labour market information it collects, it is unsuitable for this thesis and thus the prevalence estimates that follow do not include any from this particular survey.

3.4 The Prevalence of Disability in South Africa

This section presents the first empirical estimates of the thesis. The tables serve to illustrate the prevalence of disability using each measure of disability discussed in the previous section. The first three tables present the main disability measures while the next set of three tables indicate the disability types. These statistics have been presented by age cohort, first for children aged 7 to 15 years, then for those aged 16 to 59 years, and then for those 60 years of age and older. The first two age categories mirror the cohorts of people under investigation in chapters four and five respectively, namely children of compulsory school-going age and working age adults. As discussed in the previous section, the earlier surveys (prior to 2009) have fewer disability-related questions and are generally limited in terms of the disability measures that can be constructed. The Census 2011, GHS 2011 to 2017 and the CS 2016 all use the WG-SS and are therefore directly comparable. The GHS 2009 and 2010 are excluded from the following tables due to their labour market questions not being directly comparable to the 2011 – 2017 surveys, but the prevalence estimates can be found in Appendix A, Table A1 and A2. As explained, only wave one of the NIDS panel (2008) is under examination here because the questionnaire is the same in each wave. The NIDS uses separate surveys for children and adults and the child survey is very limited with regards to questions on disabilities. Thus, unlike all of the other surveys, the NIDS 2008 measures differ between children and adults.

As previously explained, each survey represented in this study has at some point used a single simplified question in an attempt to identify people with disabilities. This sort of question was included in the earlier census surveys (1996 and 2001), the CS 2007, the GHS 2002 to 2008 and again in 2011 and the NIDS 2008. Most of the surveys also have an option to identify people with multiple disabilities. In the earlier surveys prior to 2009, the measures of disability are determined by a response option to the basic question that asks about whether a person has a disability or not. The WG set of questions instead allows for a variety of ways of measuring disability. This set of questions provides opportunity for people to indicate the severity of their functional limitations alongside the domain of functioning. This provides better opportunity to identify a broader spectrum of people with disabilities.

Table 3.4 presents the prevalence of disability for children aged 7 to 15 years inclusive. Estimating prevalence statistics for children is difficult when using survey instruments that are not expressly designed for such a purpose. This is because certain developmental milestones may be age-appropriate for children but may be reported as a disability when using a set of questions designed for adults. This will be elaborated on in chapter four. Each cell shows the percentage of children who have a given measure of disability, while the values in round parentheses represent the standard errors and the square brackets represents the frequency (number of children) in millions. All estimates are weighted to population levels.

It is evident that the basic measure of disability for children captures the lowest overall prevalence estimate compared to the broad and moderate measures, and in some cases even the severe measure. The basic measure of disability is the old way of asking about disabilities and is based on a single question. The 1996 Census identifies four percent of children, or 320 000 children, with disabilities. The percentage drops to three percent (300 000 children) in 2001. This is not a large decline, but was noted above as being a result of the manner in which the disability question was asked in 2001 compared to 1996. The estimates representing the basic measure are lower in the CS 2007, GHS 2008 and GHS 2011 than in the Census. However, the NIDS 2008 reports the highest prevalence of disability for children at just over six percent (half a million children). This is likely inflated due to the inclusion of disability as well as other illnesses in the same question and researchers should therefore be cautioned in the use of this particular measure.

Indeed, for each of the disability measures except the basic measure, the relevant census captures the highest prevalence estimates within the designated measure, which may be due to the fact that the census surveys the full population rather than a representative sample. It may be that the household surveys are not capturing the full extent of the representation of disability in the country because they are generally under-sampling disability. For each of the household surveys, population weights are used to extrapolate findings to be nationally representative but given that the weights adjust to broader demographic totals they may still not be able to correct for the potential under-sampling of disability.

Table 3.4: Prevalence of disability in children aged 7 to 15 years

	Basic	Broad	Moderate	Severe	UN	Multiple
Census 1996	4.0 (0.0) [0.32]	-	-	-	-	0.2 (0.0) [0.01]
Census 2001	2.9 (0.0) [0.3]	-	-	-	-	0.2 (0.0) [0.02]
Census 2011	-	13.1 (0.0) [0.99]	8.9 (0.0) [0.67]	4.3 (0.0) [0.32	5.4 (0.0) [0.45]	2.9 (0.0) [0.24]
CS 2007	1.9 (0.0) [0.17]	-	-	0.8 (0.0) [0.07]	-	0.2 (0.0) [0.02]
CS 2016	-	8.2 (0.0) [0.78]	6.0 (0.0) [0.58]	2.1 (0.0) [0.20]	3.2 (0.0) [0.31]	1.8 (0.0) [0.17]
GHS 2008	1.6 (0.0) [0.14]	-	-	-	-	0.4 (0.1) [0.03]
GHS 2011 - 2017 (pooled)	0.9* (0.1) [0.08]	9.2 (0.2) [0.83]	6.4 (0.1) [0.57]	2.8 (0.1) [0.25]	3.7 (0.1) [0.34]	1.7 (0.1) [0.16]
NIDS 2008	6.2 (0.5) [0.54]	-	-	-	-	-

Source: Own Calculations using Census 1996, 2001 and 2011, Community Survey 2007 and 2016, GHS 2008 and 2011 to 2017 and NIDS 2008.
Notes: Data are weighted to represent the South African population of children aged 7 to 15 years. The figures represent percentages, with standard errors (in round brackets) and frequencies in millions (in square brackets). The GHS pooled sample includes 7 years of data and thus the frequencies are divided by 7 in each case. In the NIDS 2008, just under half (45 percent) of the children with disabilities (basic measure) were born with this disability. The figure indicated with a * refers to the GHS 2011 survey only.

For the broad measure, for example, the Census 2011 estimates that 13.1 percent of children have a disability whereas the CS 2016 and GHS 2011 to 2017 estimate disability at 9.2 and 8.2 percent respectively. It is interesting to note that the CS 2016 and the pooled GHS 2011 to 2017 provide very similar prevalence estimates across all measures. The frequencies reported for the pooled sample from the GHS are very similar to the CS 2016 but again, below the Census 2011. The individual survey years for each GHS can be found in Appendix A, Table A1 and A2. It is evident that the prevalence estimates vary across survey despite an attempt at standardising the measures of disability. This is to be expected as each survey has differed in terms of their sample size (who was ultimately interviewed) which may affect the extent to which a representative sample of people with disabilities was achieved. Ina addition, aside from the surveys using the WG-SS, some have differed somewhat in the wording of their questions. However, on the whole a pattern emerges for children whereby the broad measure captures the largest prevalence followed by moderate and then the UN measure, while the severe measure and multiple measure typically represents the smallest percentage of the population. It must be noted that the WG-SS tends to be more reliable for adults given that the questions have not been explicitly

designed for children. This is a limitation of the study overall given that none of the South African surveys have included the WG child functioning module. Despite this limitation, it is possible to estimate disability prevalence amongst children; however, the respondents' interpretation of the questions relative to children might be incongruous to normal age-appropriate development milestones. This will be discussed in more detail in chapter four.

Table 3.5 presents the prevalence estimates for adults of working age. The NIDS captures the highest prevalence of disability based on the basic measure (7.6 percent). The prevalence of disability in the Census 2001 is just under a third less than the estimate from the Census 1996. This is due to the change of question in the 2001 survey as discussed in section 3.3.1. Across each measure of disability, the NIDS 2008 captures the largest proportion of people as having a disability. For example, in the broad measure of disability, the NIDS identifies over six million adults (almost 22 percent) whilst the Census 2011 identifies four million (15 percent). Interestingly here the prevalence estimates for the CS 2016 is closer to the prevalence estimates of the census 2011 than to the pooled sample of the GHS as was found in the prevalence estimates for children.

The NIDS question on activities of daily living asks a few additional questions that are not explicitly covered in the WG-SS and could be part of the reason why more individuals are identified as having a disability in the NIDS. The most notable is that the NIDS asks about lifting or carrying heavy objects whereas this sort of question referencing upper body difficulties is included only in the WG extended set of questions (WG-ES-F) and not in the WG-SS. In addition, the NIDS self-care measure is based on ADL questions that refer to separate questions asking about bathing, dressing, toileting and eating whereas the WG-SS caveats their question on self-care by asking simply about bathing or dressing. These elements are certainly missing from the WG-SS and the NIDS therefore appears to be more comprehensive. However, on the whole, the NIDS is not an ideal survey for disability questions due to the reasons indicates previously. The NIDS questions can be manipulated into representing similar measures to those identified using the WG-SS; however, the types of questions differ and the scale of response in the NIDS is not standardised within the survey and therefore is not necessarily measuring the same thing as the WG-SS. Nonetheless, the NIDS does have positive features which serve to signal the need for South Africa to include the WG extended set of questions into at least one of the representative surveys in order to gain further understanding of the prevalence of disability in the country. By using the WG-ES-F, the survey questions will be standardised but expanded to account for additional domains of functioning such as upper body limitations and mental health. There is a higher prevalence of adults with disabilities compared to children in each of the surveys and the pattern for adults in both the Census and CS 2016 is that the broad measure identifies the highest prevalence of disability followed by moderate, UN then multiple and finally severe. For the GHS this pattern is such that the smallest prevalence is for multiple disabilities.

Table 3.5: Prevalence of disability in Adults (working age: 16 to 59 years)

	Basic	Broad	Moderate	Severe	UN	Multiple
Census 1996	7.1 (0.0) [1.5]	-	-	-	-	0.3 (0.0) [0.08]
Census 2001	4.8 (0.0) [1.2]	-	-	-	-	0.5 (0.0) [0.1]
Census 2011	-	15.1 (0.0) [4.31]	12.1 (0.0) [3.47]	3.0 (0.0) [0.85]	4.8 (0.0) [1.50]	3.2 (0.0) [0.99]
CS 2007	4.7 (0.0) [1.3]	-	-	2.8 (0.0) [0.78]	-	0.2 (0.0) [0.07]
CS 2016	-	13.6 (0.0) [4.5]	10.4 (0.0) [3.4]	3.2 (0.0) [1.1]	5.4 (0.0) [1.8]	3.3 (0.0) [1.1]
GHS 2008	3.7 (0.1) [1.12]	-	-	-	-	0.4 (0.0) [0.11]
GHS 2011-2017	2.4* (0.1) [0.75]	8.3 (0.1) [2.67]	6.6 (0.1) [2.11]	1.8 (0.0) [0.57]	2.5 (0.0) [0.82]	1.2 (0.0) [0.39]
NIDS 2008	7.6 (0.4) [1.80]	21.5 (0.5) [6.40]	14.8 (0.4) [4.40]	11.1 (0.4) [3.30]	12.5 (0.4) [3.70]	4.4 (0.2) [1.30]

Source: Own Calculations using Census 1996, 2001 and 2011, Community Survey 2007 and 2016, GHS 2008 and 2011 to 2017 and NIDS 2008.
Notes: Data are weighted to represent the South African population of adults aged 16 to 59 years. The figures represent percentages, with standard errors (round brackets) and frequencies in millions (square brackets). The GHS pooled sample includes 7 years of data and thus the frequencies are divided by 7 in each case. The figure indicated with a * refers to the GHS 2011 survey only.

Due to its focus on education and labour market outcomes, this thesis does not directly address older adults in the analysis of disability, but Table 3.6 is presented here to provide an overview of the prevalence of disability among adults 60 years and older. It is noticeable how much lower the prevalence of disability is using the basic measure compared to the other measures, particularly those made possible by the WG-SS. The basic measure estimates that the prevalence of disability among older adults is between 10 percent and 20 percent whereas the Census 2011 and CS 2016 estimate more than half of adults in this age group have some sort of disability. This particularly signals that questions asking about functional limitations have a better overall response rate compared to binary questions asking whether or not someone has a disability. One million people in the Census 2011 and CS 2016 have more than one disability type (multiple). The NIDS is more closely comparable to the Census and CS 2016 in the broad, UN and multiple measures.

Table 3.6: Prevalence of Older Adults (60 years and older)

	Basic	Broad	Mod	Sev	UN	Multi
Census 1996	19.1 (0.1) [0.61]	-	-	-	-	1.7 (0.0) [0.06]
Census 2001	14.5 (0.1) [0.5]	-	-	-	-	2.1 (0.0) [0.07]
Census 2011	-	50.6 (0.1) [1.95]	36.1 (0.1) [1.39]	14.8 (0.1) [0.56]	26.6 (0.1) [1.10]	22.7 (0.1) [0.94]
CS 2007	9.6 (0.1) [0.36]	-	-	6.6 (0.1) [0.24]	-	0.6 (0.0) [0.02]
CS 2016	-	54.9 (0.1) [2.5]	36.3 (0.1) [1.6]	18.6 (0.1) [0.84]	36.2 (0.1) [1.6]	29.6 (0.1) [1.3]
GHS 2008	10.4 (0.4) [0.37]	-	-	-	-	2.0 (0.2) [0.07]
GHS 2011 - 2017	6.2* (0.3) [0.24]	35.3 (0.4) [1.49]	24.6 (0.3) [1.04]	10.8 (0.2) [0.45]	17.6 (0.3) [0.75]	11.4 (0.2) [0.49]
NIDS 2008	9.6 (0.9) [0.28]	57.7 (1.6) [2.00]	44.1 (1.6) [2.50]	36.8 (1.5) [1.30]	43.1 (1.5) [1.50]	22.9 (1.2) [0.80]

Source: Own Calculations using Census 1996, 2001 and 2011, Community Survey 2007 and 2016, GHS 2008 and 2011 to 2017 and NIDS 2008. Notes: Data are weighted to represent the South African population excluding those 5 years or younger. The figures represent percentages, with standard errors (in round brackets) and frequencies in millions (in square brackets). The figure indicated with a * refers to the 2011 survey only.

The following three tables present the prevalence of each disability type for the surveys under observation. For each disability type: sight, hearing, physical, cognitive, communication, self-care and emotional there are three sub-categories namely general (gen), moderate (mod) and severe (sev). General refers to the situation where a survey does not distinguish between severities of the disability type. Moderate and severe refer to surveys that include a response scale representing severity of the disability, as discussed in the previous section on disability measures.

Table 3.7 presents the prevalence estimates for children aged 7 to 15 years for each disability type. The highest incidence out of the four disability types identified in the census 1996 is sight difficulties at just over one and a half percent of children (130 000). The 1996 census survey doesn't distinguish between moderate and severe disabilities. In the 2001 census, the largest prevalence is for those with hearing difficulties at just under one percent (80 000). In 2011, with the introduction of the WG-SS, all six of the domains of functioning can be identified, with a differentiation between moderate and severe. Here, moderate self-care, moderate sight and moderate cognitive (remembering/concentrating) difficulties represent the three highest prevalence estimates for this age cohort. In the Community Survey 2007, all disability types have a prevalence of half a percent or less. Physical difficulties are the most prominent

disability type at half a percent or 40 000 children. In the community survey 2016, which also uses the WG-SS, the highest prevalence of disability is found in moderate hearing difficulties and moderate self-care difficulties (similar to the census 2011). The GHS 2008 which uses a basic question on disability identifies cognitive difficulties as the disability type with the highest prevalence. The pooled GHS 2011 to 2017 finds similar results to the Census in that moderate sight and self-care difficulties have the highest prevalence.

The remaining concern with the WG-SS (census 2011, CS 2016, GHS 2011 to 2017) is that the questions are not specifically developed for children and thus certain estimates may be inflated or undercounted depending on the caregiver's expectations of the child's age-appropriate abilities. Unfortunately, the WG child functioning module has not yet been included in any of the South African surveys. As mentioned previously, the NIDS is even more limited in terms of the disability information available for children, where the only disability types identified for children aged 7 to 15 years are sight, physical and cognitive with sight difficulties being the most prevalent. It must be noted that in the child questionnaire sight, hearing and communication difficulties are conflated under the heading 'sight' because the NIDS doesn't distinguish between these in the question.

Table 3.8 presents the prevalence of each disability type for adults of working age (16 to 59 years) while Table 3.9 presents this information for older adults (60 years and older). Similar to the statistics for children in the table above, only the surveys that include the WG-SS allows for a distinction between moderate and severe difficulties. However, in the case of adults, the NIDS also allows for a distinction between moderate and severe. In most surveys, sight difficulties are the dominant disability type. This is to be expected given that Table 3.6 showed that moderate sight disabilities are quite prevalent among children, and eyesight deteriorates as a person ages. In the CS 2007, the GHS 2008 and NIDS, physical difficulties are the most dominant disability type. This disability usually refers to having difficulty being able to walk a kilometre or climb a flight of stairs. The NIDS differs from this by using 200m to 300m and also includes a question on upper body difficulties which is included in the physical disabilities measure here.

In Table 3.9, across all surveys sight and physical difficulties are also identified as the dominant disability types for people aged 60 years and older. The moderate versions of each type of disability is much larger than the severe version of each disability type. For example in the Census 2011, 39.5 percent of older people have moderate sight difficulties and 7.8 percent of have severe sight difficulties. In the CS 2016, 30.2 percent have moderate sight and 10.7 percent have severe sight disabilities. In the GHS, these prevalence estimates are 20.5 percent and 4.5 percent respectively. In the NIDS, the prevalence of moderate and severe sight disabilities are much closer at 17.7 and 12.8 percent respectively.

Based on the findings from the analysis above, it is evident that disability will be substantially under-reported if survey questions ask people to self-identify that they have a disability by using language that may be stigmatising and/or that fails to ask specifically about the difficulties that people may experience in their environment. This is seen in the earlier Census and GHS surveys and in the NIDS and is referred to as the basic measure of disability in this thesis. In addition, survey questions that do not distinguish between the severities of a disability would lead to moderate disabilities being substantially under-reported in all age groups. Studies that use clinical diagnoses to establish whether someone has a disability or not have identified that people with moderate disabilities are also identified as having a disability in clinical settings (Sprunt, McPake & Marella, 2019). It is for this reason that the WG questions are best suited for use in disability research involving household survey data. The WG also suggest that an approach involving a variety of measures of disability would be best practice in disability research (Washington Group on Disability Statistics, 2009, 2019).

The GHS is the preferred survey for this thesis given that it contains the WG-SS alongside detailed questions on education and the labour market. In addition, the WG-SS is asked for children over the age of 5 years in the GHS thus making it useful for an analysis of children with disabilities. The GHS prevalence estimates across each survey from 2011 to 2017 are very similar as can be seen in Appendix A, Table A1 and A2. The remaining chapters intend to estimate the relationship between disability and education and labour market outcomes using multivariate analysis. The intention is to provide a disaggregated analysis showing a more nuanced overview of disability (through various measures) thus a larger sample size would allow for a better comparison of outcomes due to enhanced statistical power in the models. It is for this reason that a seven year pooled sample of the GHS 2011 to 2017 is used in the analysis that follows.

Table 3.7: The Prevalence of each Disability Type for Children (7 to 15 years)

	Sight			Hearing			Physical			Cognitive			Communication			Self-Care			Emot
	Gen	Mod	Sev	Gen	Mod	Sev	Gen	Mod	Sev	Gen	Mod	Sev	Gen	Mod	Sev	Gen	Mod	Sev	Gen
Census 1996	1.6 (0.0) [0.13]	-	-	1.0 (0.0) [0.08]	-	-	0.7 (0.0) [0.06]	-	-	0.3 (0.0) [0.03]	-	-	-	-	-	-	-	-	-
Census 2001	0.6 (0.0) [0.06]	-	-	0.8 (0.0) [0.08]	-	-	0.4 (0.0) [0.04]	-	-	0.7 (0.0) [0.06]	-	-	0.4 (0.0) [0.04]	-	-	-	-	-	0.3 (0.0) [0.03]
Census 2011	-	3.7 (0.0) [0.30]	0.6 (0.0) [0.05]	-	2.0 (0.0) [0.16]	0.4 (0.0) [0.03]	-	1.0 (0.0) [0.08]	0.3 (0.0) [0.03]	-	3.0 (0.0) [0.24]	0.8 (0.0) [0.06]	-	1.6 (0.0) [0.12]	0.5 (0.0) [0.04]	-	6.4 (0.0) [0.50]	2.6 (0.0) [0.20]	-
CS 2007	0.2 (0.0) [0.02]	-	-	0.3 (0.0) [0.02]	-	-	0.5 (0.0) [0.04]	-	-	0.3 (0.0) [0.02]	-	-	0.2 (0.0) [0.02]	-	-	-	-	-	0.3 (0.0) [0.02]
CS 2016	-	3.5 (0.0) [0.34]	0.7 (0.0) [0.07]	-	1.8 (0.0) [0.17]	0.5 (0.0) [0.05]	-	1.2 (0.0) [0.11]	0.4 (0.0) [0.04]	-	1.9 (0.0) [0.18]	0.6 (0.0) [0.05]	-	1.3 (0.0) [0.12]	0.5 (0.0) [0.05]	-	2.4 (0.0) [0.23]	0.8 (0.0) [0.07]	-
GHS 2008	0.4 (0.0) [0.03]	-	-	0.4 (0.1) [0.04]	-	-	0.3 (0.0) [0.03]	-	-	0.5 (0.1) [0.04]	-	-	0.2 (0.0) [0.02]	-	-	-	-	-	0.2 (0.0) [0.02]
GHS 2011 to 2017	-	2.0 (0.1) [0.18]	0.3 (0.0) [0.03]	-	0.8 (0.0) [0.07]	0.2 (0.0) [0.02]	-	0.6 (0.0) [0.05]	0.4 (0,0) [0.03]	-	1.4 (0.1) [0.13]	0.7 (0.0) [0.07]	-	0.6 (0.0) [0.05]	0.4 (0.0) [0.04]	-	3.6 (0.1) [0.32]	1.9 (0.1) [0.17]	-
NIDS2008	0.8 (0.2) [0.08]	-	-	-	-	-	0.4 (0.2) [0.04]	-	-	0.6 (0.2) [0.06]	-	-	-	-	-	-	-	-	-

Source: Own Calculations using Census 1996, 2001 and 2011, Community Survey 2007 and 2016, GHS 2008 and 2011 to 2017 and NIDS 2008. Notes: Data are weighted to represent the South African population excluding those 5 years or younger. The figures represent percentages, with standard errors (in round brackets) and frequencies in millions (in square brackets). In the NIDS2008 the percentage in the "sight" column represents any problems with seeing, hearing or with speech. The questionnaire combined all three into one option in the child questionnaire.

Table 3.8: The Prevalence of each Disability Type for Adults of Working Age (16 – 59 years)

	Sight			Hearing			Physical			Cognitive			Communication			Self-Care			Other
	Gen	Mod	Sev	Gen	Mod	Sev	Gen	Mod	Sev	Gen	Mod	Sev	Gen	Mod	Sev	Gen	Mod	Sev	Gen
Census 1996	3.2 (0.0) [6.9]	-	-	1.1 (0.0) [0.2]	-	-	1.8 (0.0) [0.4]	-	-	0.8 (0.0) [0.2]	-	-	-	-	-	-	-	-	-
Census 2001	1.3 (0.0) [0.3]	-	-	0.8 (0.0) [0.2]	-	-	1.4 (0.0) [0.3]	-	-	0.7 (0.0) [0.2]	-	-	0.4 (0.0) [0.09]	-	-	-	-	-	0.9 (0.0) [0.2]
Census 2011	-	10.2 (0.0) [3.0]	1.3 (0.0) [0.40]	-	2.5 (0.0) [0.76]	0.4 (0.0) [0.13]	-	2.4 (0.0) [0.72]	0.6 (0.0) [0.18]	-	2.8 (0.0) [0.83]	0.6 (0.0) [0.18]	-	1.0 (0.0) [0.31]	0.3 (0.0) [0.09]	-	1.2 (0.0) [0.36]	0.4 (0.0) [0.11]	-
CS 2007	0.5 (0.0) [0.14]	-	-	0.4 (0.0) [0.11]	-	-	1.9 (0.0) [0.54]	-	-	0.2 (0.0) [0.06]	-	-	0.2 (0.0) [0.06]	-	-	-	-	-	1.1 (0.0) [0.30]
CS 2016	-	3.5 (0.0) [0.34]	0.7 (0.0) [0.07]	-	1.8 (0.0) [0.17]	0.5 (0.0) [0.05]	-	1.2 (0.0) [0.11]	0.4 (0.0) [0.04]	-	1.9 (0.0) [0.18]	0.6 (0.0) [0.05]	-	1.3 (0.0) [0.12]	0.5 (0.0) [0.05]	-	2.4 (0.0) [0.23]	0.8 (0.0) [0.07]	-
GHS 2008	0.8 (0.0) [0.24]	-	-	0.4 (0.0) [0.12]	-	-	1.3 (0.1) [0.39]	-	-	0.7 (0.0) [0.21]	-	-	0.2 (0.0) [0.06]	-	-	-	-	-	0.4 (0.0) [0.13]
GHS 2011 to 2017	-	5.1 (0.1) [0.16]	0.6 (0.0) [0.20]	-	1.0 (0.0) [0.31]	0.2 (0.0) [0.08]	-	0.8 (0.0) [0.27]	0.5 (0.0) [0.16]	-	1.0 (0.0) [0.32]	0.5 (0.0) [0.16]	-	0.3 (0.0) [0.10]	0.2 (0.0) [0.06]	-	0.3 (0.0) [0.11]	0.3 (0.0) [0.08]	-
NIDS2008	-	6.9 (0.3) [1.90]	4.5 (0.3) [1.30]	-	2.7 (0.2) [0.76]	1.8 (0.2) [0.50]	-	8.9 (0.4) [2.10]	8.5 (0.4) [2.00]	-	-	-	-	-	-	-	1.3 (0.1) [0.32]	0.4 (0.1) [0.10]	-

Source: Own Calculations using Census 1996, 2001 and 2011, Community Survey 2007 and 2016, GHS 2008 and 2011 to 2017 and NIDS 2008. Notes: Data are weighted to represent the South African population excluding those 5 years or younger The figures represent percentages, with standard errors (in round brackets) and frequencies in millions (in square brackets).

Table 3.9: The Prevalence of each Disability Type for Older Adults (60 years +)

	Sight			Hearing			Physical			Cognitive			Communication			Self-Care			Other
	Gen	Mod	Sev	Gen	Mod	Sev	Gen	Mod	Sev	Gen	Mod	Sev	Gen	Mod	Sev	Gen	Mod	Sev	Gen
Census 1996	10.6 (0.1) [0.3]	-	-	3.9 (0.0) [0.1]	-	-	5.0 (0.0) [0.2]	-	-	1.1 (0.0) [0.03]	-	-	-	-	-	-	-	-	-
Census 2001	6.3 (0.0) [0.2]	-	-	3.5 (0.0) [0.1]	-	-	4.9 (0.0) [0.2]	-	-	0.7 (0.0) [0.03]	-	-	0.6 (0.0) [0.02]	-	-	-	-	-	1.3 (0.0) [0.05]
Census 2011	-	36.4 (0.1) [1.4]	7.1 (0.0) [0.28]	-	14.9 (0.1) [0.58]	2.9 (0.0) [0.11]	-	17.9 (0.1) [0.70]	5.2 (0.0) [0.21]	-	15.7 (0.1) [0.62]	4.1 (0.0) [0.16]	-	4.1 (0.0) [0.16]	0.9 (0.0) [0.04]		7.7 (0.0) [0.30]	2.7 (0.0) [0.10]	-
CS 2007	2.1 (0.1) [0.08]	-	-	1.1 (0.0) [0.04]	-	-	4.3 (0.1) [0.16]	-	-	0.2 (0.0) [0.01]	-	-	0.2 (0.) [0.01]	-	-	-	-	-	1.1 (0.0) [0.04]
CS 2016		39.5 (0.1) [1.80]	7.8 (0.1) [0.35]	-	19.0 (0.1) [0.86]	3.4 (0.0) [0.15]	-	30.2 (0.1) [1.40]	10.7 (0.1) [0.49]	-	20.7 (0.1) [0.31]	4.5 (0.0) [0.05]	-	6.9 (0.1) [0.94]	1.2 (0.0) [0.20]	-	12.1 (0.1) [0.55]	3.3 (0.0) [0.15]	-
GHS 2008	4.1 (0.2) [0.15]	-	-	2.6 (0.2) [0.09]	-	-	4.1 (0.3) [0.15]	-	-	0.5 (0.1) [0.02]	-	-	0.7 (0.1) [0.02]	-	-	-	-	-	0.6 (0.1) [0.02]
GHS 2011 to 2017	-	20.5 (0.3) [0.83]	4.5 (0.1) [0.19]	-	6.9 (0.2) [0.29]	1.7 (0.1) [0.07]	-	9.1 (0.2) [0.37]	5.2 (0.1) [0.22]	-	5.8 (0.2) [0.24]	2.0 (0.1) [0.09]	-	0.8 (0.1) [0.03]	0.4 (0.0) [0.02]	-	2.3 (0.1) [0.09]	1.5 (0.1) [0.06]	-
NIDS2008	-	17.4 (1.1) [0.58]	12.8 (0.9) [0.43]	-	12.2 (1.0) [0.41]	4.6 (0.7) [0.15]	-	32.6 (1.6) [0.97]	34.5 (1.5) [1.00]	-	-	-	-	-	-	-	9.2 (1.0) [0.28]	2.9 (0.5) [0.09]	-

Source: Own Calculations using Census 1996, 2001 and 2011, Community Survey 2007 and 2016, GHS 2008 and 2011 to 2017 and NIDS 2008. Notes: Data are weighted to represent the South African population excluding those 5 years or younger. The figures represent percentages, with standard errors (in round brackets) and frequencies in millions (in square brackets).

3.5 Concluding Comments

The main objectives of this chapter were to identify South African household surveys that capture information on disability, education and the labour market and illustrate the origins of the survey questions and how they link to the models of disability. Following this, the chapter aimed to demonstrate how the survey questions translate into disability measures and lastly to estimate the prevalence of disability for each survey and measure. There are four main surveys used in this chapter: the national Census, the Community Survey, the General Household Survey and the National Income Dynamics Study. In some cases, it was pertinent to illustrate the evolution of these surveys by discussing and showing how the questions and therefore the disability measures have changed.

The medical model as a means of understanding disability was dominant in South Africa up until 2009, when the questions included in household survey started to change following the ratification of the CRPD in 2007. The Washington Group had been tasked with creating survey questions based on the international classification of functioning, a combination of the medical and social models of disability, to use in census and household surveys. The questions were specifically designed for countries that ratified the CRPD to use to monitor the outcomes set out by the CRPD.

Notably, the disability component of the South African Census has evolved over the 15-year period from its roots in the medical model to the inclusion of the Washington Group Short Set of questions on disability (WG-SS) in order to monitor the goals of the CRPD in terms of accessibility to education and the workplace. The GHS has had a similar evolution whereby 2009 marked the start of the inclusion of the WG-SS. The Community Survey in 2016 was also updated to include the WG-SS. The NIDS is the only survey of the four to not have advanced to using the same international standard of disability questions. However, it is possible in part to match the measures of disability in the NIDS to the surveys that use the WG-SS by using various combinations of the disability and 'activities of daily living' questions. It must be noted that, whilst the measures are similar, the questions within the NIDS are not wholly standardised in terms of the scale of response and are rooted to a large extent in the old paradigm whereby the survey still uses the term handicap which is offensive and perpetuates the stigma and negative attitudes towards people with disabilities. In addition, the child questionnaire in NIDS is very limited in the types of disability questions asked. The NIDS is therefore not directly comparable with other surveys such as the Census 2011 or GHS (2011 to 2017).

Six main measures of disability are established in this chapter ranging from a basic measure to a measure of multiple disabilities. The basic measure is largely based on the binary disability question used in older surveys, which was rooted in the medical model. The broad measure encapsulates all people with any kind of disability, whether moderate or severe, while separate measures for moderate and severe

are also used. The UN measure which is used in reports by the United Nations and StatsSA includes people with at least one severe or two or more moderate disabilities. Finally, a measure of multiple disabilities includes anyone who has more than one disability type. In addition to these six measures, each individual disability type indicated by each survey is also used.

The surveys using the WG-SS are preferable over those rooted in the ICIDH in terms of an analysis of children with disabilities given that the questions are standardised and used in multiple household surveys within a country as well as used internationally thus allowing for cross-country comparison as well as in-country comparison. They are also broader than the basic binary questions offered in the earlier surveys as they include details on functional limitations. However, the NIDS is not suitable to an analysis of childhood disability given that the questions on disability are very limited. The benefit of the NIDS is that it is a panel study which allows for researchers to track children over time but as mentioned it does not collect detailed information on disability for children. It does instead collect information on whether children were born with the disability or not which is something missing from other surveys. According to the findings, close to half of all children with a disability were born with that disability. Such a question would be worth considering including in the other surveys alongside the WG questions in future.

Based on the prevalence estimates presented in Tables 3.4, 3.5 and 3.6 above, there are around four million South Africans of working age with disabilities (broad). Just under one million children and two million older adults are estimated to have disabilities, either moderate or severe (broad). On the whole, a larger percentage of older adults report disabilities which is to be expected given that disability is also associated with the normal ageing process. This is also noted in the disability type tables (3.7 to 3.9) where older adults report sight difficulties or physical difficulties as the most common types, both of which are indications of ageing. Sight difficulties and cognitive difficulties (WG-SS) are the most commonly-reported disability type across surveys for adults of working age. For children, self-care, cognitive and sight difficulties are dominant.

On the whole, the prevalence estimates are largest in the Census 2011 followed by the CS 2016 and then the pooled GHS (2011 to 2017). This can be attributed to sample size and representation as the questions themselves are identical across all three surveys. The pooled GHS (2011 to 2017) is favoured over the others for the reason that it contains a wide range of detailed education and labour market questions, which make it most suitable to achieve the research objectives inherent in this thesis. It must be noted that the 2009 and 2010 GHS were excluded here, and their estimates shown only in Appendix A, Table A1 and A2 due to the inconsistency in their labour market questions. Thus, for the forthcoming chapters, the pooled sample of the GHS (2011 to 2017) will be analysed, using the range of disability

measures established in this chapter. The next chapter, chapter four, focuses on school attendance and progression, comparing children with disabilities to children without disabilities. This analysis aims to establish how educational attendance and progression is affected by childhood disability, and the extent to which the relationship between education and disability changes based on the severity and type of disability that the child has.

Chapter Four

The relationship between childhood disability, school attendance and progression

4.1 Introduction

Access to education is crucial for children's development in terms of knowledge, self-esteem, socialisation and an understanding of different cultures. Educational attainment is also strongly associated with labour market outcomes. Therefore if educational attainment is compromised at childhood level, there may be long term economic consequences in adulthood (Grossman, 1972; Stabile & Allin, 2012). A child's access to schooling is a potential short-run indicator of the impact of disability exclusion, whereas overall educational attainment indicates the long run impact of disability exclusion (Stabile & Allin, 2012). Children with disabilities may experience intermittent school attendance or be unable to attend school altogether. Children with disabilities might attend school intermittently due to factors pertaining to their disabilities and they may therefore need to engage with schooling for longer than children without disabilities in order to attain the same final level of education. This chapter therefore presents an analysis of the relationship between childhood disability on both school attendance and progression in South Africa thereby addressing the second major research objective of this thesis.

The global movement towards ensuring that all children have access to schooling was largely driven by the United Nation's Millennium Development Goal (MDG) of universal primary education and the Education for All (EFA) programme introduced by the United Nations Educational, Scientific and Cultural Organisation (UNESCO). Both of these initiatives targeted 2015 as the year in which this goal would be achieved, but in practice there remain a substantial number of children who are out of school worldwide (Filmer, 2008; Fleisch, Shindler & Perry, 2012; Department of Social Development, 2015; Mizunoya, Mitra & Yamasaki, 2016). The Sustainable Development goals replaced the MDGs from 2015 and the goal specific to education aims to ensure inclusive and equitable quality education. Disability is a challenging and multifaceted issue and is often neglected at the level of policy implementation because of the lack of up-to-date data on children and their needs. Without a source of data to monitor and evaluate the situation for children with disabilities, it is very difficult to ascertain where the challenges lie and what resources are required to accommodate theses children in terms of their education. This is particularly the case in developing countries where there is a dearth of data on children with disabilities (Filmer, 2008; Fleisch, Shindler & Perry, 2012; Mizunoya, Mitra & Yamasaki, 2016).

The United Nations Children's Fund (UNICEF) prioritises the protection of children from all forms of violence and discrimination, and considers children with disabilities to be at risk in these areas (Loaiza, 2005). Addressing this discrimination involves adequate service provision in terms of healthcare and education as well as efforts to alter perceptions or attitudes towards people with disabilities (Loaiza, 2005). The Sustainable Development Goals (SDGs) indicate a strong commitment to ensure incision of people with disabilities (United Nations, 2019). SDG 4 focuses on quality education, because whilst major strides have been made to improve the school attendance of children (particularly those in primary education) there remains a significant number who are not in school and these children are largely concentrated in Sub-Saharan Africa (United Nations, 2015). SDG 4 therefore aims to address equitable access to schooling as well as ensure that facilities are conducive to meet the needs of children with disabilities (United Nations, 2019).

Notwithstanding the commitment to bolstering access to education worldwide, schooling systems in many parts of the world lack the specialised human and physical capital essential to meeting the specific needs of children with disabilities (Mizunoya, Mitra & Yamasaki, 2016; Deghaye, 2021). Limited resources mean inaccessible learning environments, which deny children with disabilities the same educational opportunities as their peers without disabilities. The development of effective policies and programmes to increase access to learning is hindered by a lack of appropriate and comparable micro-level data across countries. Without this type of information, stakeholders are unable to fully understand the global educational concerns for children with disabilities therefore exacerbating the lack of inclusive educational policies as well as the inefficient implementation of such policies (Department of Social Development, 2015; Mizunoya, Mitra & Yamasaki, 2016; Deghaye, 2021). A study on inclusive education for children with disabilities in developing countries determined that as a country's gross national income rises, so too do their resources available for improving education; however, children without disabilities disproportionately benefit from this improvement (Mizunoya, Mitra & Yamasaki, 2016). This points to the notion that policy and the implementation thereof, particularly with regards to children with disabilities, remains ineffective and is enshrined in ableism. It is suggested that the education system structurally fails in the provision of sufficient resources and support for children with disabilities (Mizunoya, Mitra & Yamasaki, 2016).

In order to monitor and evaluate education for children with disabilities, it is important for countries to have census or household surveys that allow for the collection of prevalence information on disability alongside information on school attendance and education in general. Historically, disability-related questions in household surveys have themselves been scarce. However, over the past two decades countries have started to incorporate a disability module into their national surveys. At first there was a lack of standardisation of disability questions across surveys and countries as well as a lack of detail

within the surveys in terms of the questions used (discussed in detail in chapter three). This made comparison for monitoring purposes more difficult and as such very little empirical evidence used to exist upon which to inform policies regarding education for children with disabilities (Mont, 2007; Filmer, 2008; Mizunoya *et al*, 2016). There also remains a lack of knowledge concerning the schooling experience of children with disabilities in African countries given that very few studies have attempted to investigate this issue explicitly. This is largely due to previous surveys not offering a combination of education and disability modules with which to conduct such analysis. This has changed since the introduction of the WG-SS questions into survey design.

However, using household surveys to analyse children with disabilities is complicated by the fact that most survey questions are not specifically aimed at children. As discussed in chapter three, the WG-SS is a standardised and convenient means of collecting information on disability but given that it isn't intended for children, it is likely to underestimate disability. First, the WG-SS includes six key domains of functioning: seeing, hearing, walking, self-care, communication and remembering/concentrating. However, it is missing some of the key functional domains relevant to children such as behavioural and neurological concerns (Loaiza, 2005; Cappa et al., 2018; Sprunt et al, 2019). Second, it is not applicable to children below the age of five years given that very young children may be misclassified as having a disability (Statistics South Africa, 2011). For instance, a child under the age of five may accurately be reported as not be able to walk a kilometre without assistance or dress themselves without help; however, all else considered, this would be considered normal development for a child of that particular age.

In addition, chapter three explained that the WG-SS will not necessarily be able to identify all children with disabilities because it is not specifically designed for children and as such may result in undercounting (Mizunoya *et al*, 2016; Washington Group, 2019). Despite the relatively low prevalence of disability identified using the WG-SS, both univariate and multivariate analysis strongly suggest that children with disabilities are more likely to be out of school compared to children without disabilities (Mizunoya *et al*, 2016). Furthermore, it is suggested that even if children with disabilities are in school, it doesn't mean that education is being delivered appropriately and that learning is taking place (Mizunoya *et al*, 2016). Similarly, a report on South Africa reveals that children with disabilities are more likely to be out of school then those without disabilities and that if they are at school they don't necessarily access the same level of quality education (Department of Social Development, 2015).

UNICEF in conjunction with the Washington Group finalised two child-specific questionnaires in 2016. These are based on the extended set of questions on disability (WG, 2017). At the time of writing, these have not yet been incorporated into any household survey in South Africa. There are two separate sets

of questions that form the Child Functioning Module (CFM) specially designed for children: the first is for those aged two to four years old and the second for children aged five to 17 years old.[4] There are 16 questions covering 8 core domains in the young CFM (aged 2 to 4 years). The domains covered include seeing, hearing, walking, fine motor, communication/comprehension, learning, playing and controlling behaviour. For children age 5 to 17, there are 24 questions covering 12 core domains, which include seeing, hearing, walking, self-care, communication/comprehension, learning, remembering, concentrating, accepting change, controlling behaviour, making friends, and affect (anxiety and depression) (UNICEF, 2017). The CFM for children two to four years of age include the phrase "compared to children of the same age" for the questions addressing mobility, fine motor skills and learning difficulties (UNICEF, 2017). This assists in ensuring that children are not misclassified as having a disability when their level of ability is appropriate for their age and early childhood development stage.

A few studies have been carried out in order to validate the CFM. One was conducted in Samoa, Serbia and Mexico (Cappa *et al.*, 2018) and another in Fiji (Sprunt *et al*, 2019). The Fijian study concludes that whilst the CFM is an important inclusion given its convenience and the fact that data collection in this particular area is urgent, its accuracy in identifying children with disabilities is assessed only at the level of 'fair'. The study recommends that the CFM be utilised alongside clinical assessments in order to improve the accuracy of identification. The scale of responses to each question is the same as the WG-SS and includes: no difficulty, some difficulty, a lot of difficulty and unable to do. Previously, the cut-off point in terms of analysis of disability has been at where someone reports a lot of difficulty and as such those indicating that they have some difficulty have been excluded. The sentiment from the Fijian study is that a number of children identified as having some difficulty have been identified as having disabilities based on the clinical assessments conducted. They therefore caution that this category cannot necessarily be eliminated completely from an analysis (Department of Social Development, 2015; Sprunt *et al*, 2019). Thus when analysing children with disabilities it is important to ensure a wide range of measures of disabilities which is what this thesis aims to do.

The study conducted in Samoa, Serbia and Mexico indicates that the WG-SS and the CFM are comparable for children older than 5 years except for the cognition or learning domains (Cappa et al., 2018). However, the CFM is deemed to be preferable for collecting data on children given that the WG-SS is not suitable for very young children (under 5 years). In addition, the WG-SS leaves out important

[4] See Appendix A4, Box B1 and B2 for full set of questions

functional domains for children aged five to 17 years, particularly with regards to developmental disabilities and behavioural issues (Cappa et al., 2018).

Guatemala recently completed an analysis of disability using the CFM for children and the WG-ES-F for adults. It was one of the very few countries to do so and make their findings publicly available. The prevalence of disability was five percent for children aged 2 to 17 years of age where disability is defined as anyone reporting a lot of difficulty or being unable to do any of the domains listed in the CFM. In addition, they included those reporting some difficulty only if disability was confirmed by clinical assessments (ICED, 2017). The main conclusions regarding children highlight the vulnerabilities of children with disabilities in rural areas in terms of access to schooling. In addition, children with cognitive and physical limitations have the least access to schooling compared to all of the other disability types (ICED, 2017).

The South African government have prioritised education for all and in particular have emphasised the importance of ensuring children with disabilities are attending school. Based on the Education White Paper 6 (DoE 2001), the South African Department of Education produced the Guidelines for Full-service/Inclusive Schools in 2010 which promote that all children with disabilities should be included in mainstream schools. These guidelines were developed based on field testing over the 2004 to 2009 period and are intended to provide schools with strategies to allow them to become inclusive (DBE 2010). To date, it is unclear the extent to which this policy has been adequately implemented in the country. Some studies have noted the problems associated with implementation such as a lack of resources, knowledge and support (Eloff & Engelbrecht, 2002; Dalton, Mckenzie & Kahonde, 2012; Deghaye, 2021)

The Washington Group questions have gained wide acceptance globally, but the CFM remains new. As mentioned, amongst countries that include questions on disability in their household surveys, very few have both a module on education and disability (Mizunoya *et al*, 2016). Evidence pertaining to the educational experience of children with disabilities in South Africa is therefore still in its infancy. South Africa has, in the last decade, seen the addition of the WG-SS into the Census 2011 and each annual General Household Survey since 2009. Both the Census and the GHS collects information on access to schooling (school attendance) and disability. The GHS contains numerous questions around the full educational experience of children and therefore allows for an extensive investigation of the links between education and disability on a nationally-representative scale. This chapter therefore seeks to contribute towards this body of evidence by providing a range of prevalence estimates and an analysis of education for children with disabilities.

In South Africa, a few studies have examined the prevalence of disability (based on the WG-SS) among school-aged children and how disability relates to school attendance. These studies typically use data from a single specific year such as the 2011 Census or GHS (Filmer, 2008; Department of Social Development, 2015; Mizunoya, Mitra & Yamasaki, 2016). More recent research on this matter is not available as yet and as such an examination of any changes over time has not been possible. In addition there is no existing research on the progression of children with and without disabilities in school. In order to fill this research gap, this chapter presents an analysis of school attendance for children with disabilities as well as an analysis of school progression (in terms of grade for age). A brief discussion is presented on how attendance has changed over time. Overall, this provides a more up to date analysis of school attendance and the first of its kind in terms of an analysis of school progression and aims to address the following sub-objectives:

Sub-objectives:

- **i.** Provide a detailed overview of the characteristics of children of compulsory school-going age (7-15 years) in South Africa.
- **ii.** Establish the relationship between disability and school attendance for children aged 7-15 years.
- **iii.** Establish the relationship between disability and progression through schooling for children aged 7-15 years.

The sample consists of all children of compulsory school-going age, that is, ages seven to fifteen in South Africa. This age range will be analysed given that these children are required by law to attend school and thus if they are not in school, it points to wider access issues. The inclusion of the WG-SS in the GHS allows for the presentation of education statistics from the GHS 2011 to 2017. This chapter aims to establish the school attendance of children with disabilities compared to children without as well as the extent to which the children who are able to access schooling, progress in school at the same rate as their peers without disabilities.

The remainder of this chapter is structured as follows. Section 4.2 presents the descriptive statistics and contains a brief description of the data and the variables under examination. Section 4.3 presents the multivariate analysis in two sub-sections, where the first includes probit estimation for school attendance and the second includes ordered probit estimation for school progression. Section 4.4 will then conclude the analysis for children with disabilities in South Africa.

4.2 Data and Descriptive Statistics

The pooled sample of the South African General Household Survey (GHS) 2011 to 2017, will be used in this chapter focusing specifically on children of compulsory school age (7 to 15 years). As discussed in chapter three, the GHS asks detailed questions around disability, education and school attendance. This survey uses the WG-SS and is therefore well-placed for an analysis of school attendance for children with disabilities. Given the relatively small proportion of children with disabilities identified in the GHS relative to the Census (chapter three), particularly amongst children with severe or multiple disabilities, a seven year pooled sample will be used to increase the number of observations, therefore allowing for greater explanatory power in terms of the multivariate analysis. Throughout the analysis, the estimates are weighted to population levels using the weights based on the Census 2011, provided by StatsSA. The results should therefore be interpreted as representative of the population of children living in South Africa between 2011 and 2017. However, it is noted that population weights account largely for demographic characteristics and don't necessarily address the possible under sampling of people with disabilities.

The following section aims to present an overview of childhood disability and education in South Africa. This will be done using the five disability measures discussed in chapter three namely broad, moderate, severe, UN and multiple. The estimates of the prevalence of disability among children, using each measure, are reproduced from chapter three at the top of Table 4.1, for reference. In addition, where applicable, each individual disability type will be used in some of the later analysis. The section begins with an overview of the characteristics of children with disabilities compared to all children in the sample. Thereafter, aspects relating to school attendance and progression will be examined in detail.

The mean characteristics of children are presented in Table 4.1 below, where the first column represents the national average which includes both children with disabilities as well as those without. This first column is included as a reference column showing the overall average for children in South Africa for each of the characteristics. The remaining columns represent the characteristics of children with disabilities as per the main disability measures that were discussed in chapter three. The figures for each measure of disability can therefore be compared to the overall average. For characteristics that are categorical in nature, the mean of each category represents the proportion of children who fall into that category. The rationale behind using the national average as the reference category is that, for each measure of disability, the base category that refers to no disabilities is different. For example, using the severe measure of disability, children without such disabilities may include children with moderate disabilities. In contrast, for moderate disabilities, children without disabilities only includes people without any type of disability. Thus, whilst the national average is essentially a conservative measure of comparison to the population as a whole, and doesn't directly demonstrate the difference between

children with and without disabilities, it allows for a consistent comparison figure for each of the measures of disability. The significance levels in each case have been calculated to indicate that the mean value of a particular characteristic is significantly different for people with disabilities compared to people without disabilities (as defined by the particular disability measure).

Table 4.1: The mean characteristics of children (7 -15 years) in South Africa, by disability measure

	All	Broad	Moderate	Severe	UN	Multiple
Prevalence of disability		**0.092**	**0.064**	**0.028**	**0.037**	**0.017**
		(0.002)	**(0.001)**	**(0.001)**	**(0.001)**	**(0.001)**
Characteristics of each subsample:						
Gender:						
Male	0.502	0.517**	0.507	0.540***	0.531***	0.525
	(0.002)	(0.007)	(0.008)	(0.012)	(0.010)	(0.015)
Female	0.498	0.483**	0.493	0.460***	0.469***	0.475
	(0.002)	(0.007)	(0.008)	(0.012)	(0.010)	(0.015)
Race:						
African	0.841	0.881***	0.878***	0.889***	0.891***	0.889***
	(0.003)	(0.006)	(0.007)	(0.009)	(0.008)	(0.011)
Coloured	0.087	0.057***	0.058***	0.057***	0.055***	0.054***
	(0.002)	(0.004)	(0.004)	(0.005)	(0.005)	(0.007)
Indian	0.018	0.013**	0.012***	0.014	0.013	0.009**
	(0.001)	(0.002)	(0.002)	(0.006)	(0.004)	(0.004)
White	0.054	0.049	0.053	0.040**	0.041**	0.048
	(0.002)	(0.004)	(0.005)	(0.006)	(0.005)	(0.008)
Location:						
Urban	0.554	0.538*	0.546	0.520**	0.522**	0.545
	(0.005)	(0.010)	(0.010)	(0.016)	(0.014)	(0.019)
Rural	0.446	0.462*	0.454	0.480**	0.478**	0.455
	(0.005)	(0.010)	(0.010)	(0.016)	(0.014)	(0.019)
Mother is part of the household	0.699	0.716***	0.717***	0.712	0.712	0.712
	(0.003)	(0.006)	(0.007)	(0.011)	(0.009)	(0.014)
Mother's education[+]:						
Missing education	0.006	0.007	0.006	0.009	0.008	0.005
	(0.000)	(0.001)	(0.001)	(0.003)	(0.002)	(0.002)
No School	0.028	0.023***	0.020***	0.030	0.026	0.019**
	(0.001)	(0.002)	(0.002)	(0.004)	(0.003)	(0.004)
Primary education	0.110	0.113	0.109	0.123	0.129***	0.139***
	(0.002)	(0.005)	(0.005)	(0.008)	(0.007)	(0.011)
Incomplete Secondary education	0.282	0.315***	0.317***	0.312***	0.303**	0.302
	(0.003)	(0.006)	(0.007)	(0.011)	(0.009)	(0.014)
Matric	0.180	0.173	0.175	0.166	0.166*	0.166
	(0.003)	(0.006)	(0.007)	(0.009)	(0.008)	(0.012)
Tertiary education	0.094	0.088	0.093	0.076**	0.082*	0.085
	(0.002)	(0.005)	(0.005)	(0.008)	(0.007)	(0.011)
Household Size:						
Number of children <15 years	2.235	2.197*	2.188	2.219	2.197	2.126***
	(0.016)	(0.030)	(0.039)	(0.035)	(0.030)	(0.043)
Number of adults (16-59 years)	2.927	2.869**	2.850*	2.913	2.884	2.868
	(0.019)	(0.037)	(0.048)	(0.045)	(0.040)	(0.060)
Number of older adults 60+	0.310	0.284***	0.277***	0.299	0.298	0.287
	(0.005)	(0.008)	(0.009)	(0.013)	(0.012)	(0.018)
Provinces:						
Gauteng	0.195	0.186	0.199	0.156***	0.170**	0.213
	(0.004)	(0.008)	(0.009)	(0.012)	(0.011)	(0.017)

Western Cape	0.101	0.060***	0.060***	0.059***	0.055***	0.049***
	(0.003)	(0.004)	(0.005)	(0.006)	(0.005)	(0.007)
Free State	0.050	0.057**	0.057**	0.056	0.052	0.042
	(0.002)	(0.004)	(0.004)	(0.006)	(0.005)	(0.006)
Northern Cape	0.022	0.035***	0.031***	0.044***	0.037***	0.019
	(0.001)	(0.002)	(0.002)	(0.004)	(0.003)	(0.003)
Mpumalanga	0.084	0.093*	0.088	0.105**	0.087	0.042***
	(0.002)	(0.006)	(0.006)	(0.010)	(0.008)	(0.006)
North West	0.067	0.097***	0.089***	0.115***	0.104***	0.094**
	(0.002)	(0.007)	(0.006)	(0.012)	(0.010)	(0.013)
KwaZulu-Natal	0.226	0.186***	0.185***	0.187***	0.182***	0.174***
	(0.004)	(0.007)	(0.008)	(0.012)	(0.010)	(0.014)
Limpopo	0.114	0.153***	0.149***	0.160***	0.158***	0.128
	(0.003)	(0.007)	(0.007)	(0.012)	(0.011)	(0.013)
Eastern Cape	0.141	0.134	0.142	0.117***	0.156	0.239***
	(0.003)	(0.006)	(0.007)	(0.009)	(0.010)	(0.017)
Household Income:						
Earnings from employment	6.771	6.014***	6.304	5.350***	5.329***	5.059***
	(0.122)	(0.285)	(0.359)	(0.399)	(0.330)	(0.406)
Other income	4.589	3.834	3.044*	5.636	4.672	1.634***
	(0.596)	(0.936)	(0.788)	(2.485)	(1.835)	(0.542)
Grant income	1.301	1.344**	1.261*	1.533***	1.481***	1.570***
	(0.014)	(0.024)	(0.027)	(0.040)	(0.035)	(0.053)
Sample	105169	10130	6903	3227	4334	1883
Population	64289113	5780020	4019563	1760457	2407628	1121859

Source: Own Calculations, Pooled GHS 2011-2017.

Note: The significance levels highlight the difference between people with disabilities compared to people without disabilities (as defined for each measure): *** significant at the 1% level, ** significant at the 5% level and * significant at the 10% level. Earnings/income values are measured in thousands of Rands per month and are inflation adjusted with 2017 as the base year. [+]Mother's education data refers to completed education and does not sum to 100 percent because information is only recorded for mothers that are living in the household.

Gender is represented by a dummy variable that equals one if a child is a male and zero if female, with both categories presented in Table 4.1. The population of children age 7 to 15 years is split almost equally between males and females; however, the proportion of males in the population is slightly larger for those with disabilities and this gender difference is significant for the broad, severe and UN measures of disabilities. This means that slightly more male children report disabilities compared to females and that the gender composition of children with disabilities is statistically different from children without disabilities. Using the four main race categories that are commonly reported in South Africa namely African, Coloured, Indian and White, dummy variables were created for each where the variable takes on the value of one based on a person's reported race. According to Table 4.1, Africans make up the majority of the population (84 percent) followed by Coloureds, Whites and Indians respectively. This pattern is consistent across each of the disability measures as well; however, the proportion of Africans is slightly larger at 88 percent for people with broad or multiple disabilities, 89 percent for people with moderate or UN disabilities and is highest among people with severe disabilities (90 percent). In each case, Africans with disabilities are therefore significantly overrepresented compared to those without disabilities.

Location is represented by two measures. First, a dummy variable is defined as one if a person resides in an urban area and zero if they reside in a rural area. Both categories are presented in the table below. Children with disabilities as measured by the broad (46 percent) and severe or UN measure (48 percent) are overrepresented in rural areas compared to the national average of 45 percent. This is statistically different from children without disabilities and is consistent with the literature that indicates the people with disabilities are typically vulnerable to poorer socioeconomic circumstances. Second, each of the nine provinces are represented by dummy variables and they have been listed in Table 4.1 from richest to poorest based on GDP per capita (2017) (StatsSA, 2019). The proportion of children with disabilities (broad, moderate, severe and UN) living in the richer provinces compared to the poorer provinces is very similar to the national average. In some instances, notably the Western Cape which is considered a wealthier province, the proportion of children with disabilities is significantly lower with respect to children without disabilities. However, in the case of children with multiple disabilities, they are overrepresented the Eastern Cape which is considered a relatively poorer province.

The variable for earned income was derived as the sum of all earnings from employment from all individuals within the household. Earnings were reported on an individual basis as monetary values earned either weekly, monthly or annually. Where people chose not to report their point earnings values, earnings were reported as income categories. The point values were converted to monthly values and the income categories were included by taking the midpoint value of each category for each person who reported earnings through this medium. Grant income was created by assigning the values of each grant (each year) to the question that asked respondents to report the type of grant they received. If more than one person in the household earns grant income, these were added together to determine the total household grant income. Other income corresponds to remittances or pension income (not including old age grants) received by each household from people living outside of the household. All income variables have been adjusted for inflation using 2017 as the base year. The figures in the table are reported in thousands of Rands per month.

Household earned income is lower for households with children with disabilities compared to the national average. Household earnings for households with children with multiple disabilities is just over R1700 lower than the national average. For children with disabilities based on the UN and severe measure, the household earnings is almost R1500 below the national average. All of these figures are statistically different from children without disabilities. Other income varies quite substantially whereby children with disabilities (severe or UN) live in households with significantly higher income from these sources whilst children with multiple disabilities live in households with significantly lower income from other sources. It is possible in the case of the severe and UN measure that a parent or family member is supporting the household from afar due to the child having disabilities and the household

requiring additional support. Grant income for the households is slightly higher (around R200 to R300 more) for children with severe, UN or multiple disabilities compared to the national average. This is expected given that these children would likely have qualified for the care dependency grant.

In terms of household size, three measures are included. These are the number of children 15 years and under (including the child who is the unit of observation), the number of working age adults (16 to 59 years) and the number of older adults (60 years and older) in the household. Children with disabilities come from slightly smaller households compared to the average for all children. However, the household size indicators are not always statistically different from children without disabilities. The inclusion of dummy variables representing the various levels of a mother's education is based on the literature that suggests that a child's socioeconomic status is best captured through mother's education (Loaiza, 2005; Branson et al, 2014; Lamichhane and Kawakatsu, 2015). In addition, a dummy variable representing whether or not the child's mother lives in the same household is included as this also accounts for the potential for the mother to influence a child's education. For the broad and moderate measures of disability, a slighter larger proportion of children with disabilities have their mother living in their household than for all children. This is statistically different from children without disabilities. The mothers of children with disabilities are overrepresented in the lower levels of education such as primary schooling and incomplete secondary schooling whereas in the higher levels of schooling (completed secondary and matric), the opposite is observed.

The mother's education data refers to completed education and information is only recorded for mothers that are living in the household. It should be noted that an additional dummy variable representing the category of missing values was also created. This was so as to ensure that as many observations as possible were retained for the analysis purposes. Thus, the mother's education dummy variables include missing values, no schooling, primary school, some secondary schooling, completed secondary (matric) and tertiary education. The dummy variable capturing whether a mother is part of the household is created such that it equals one if the mother is living in the household and zero if they are not or if the mother's status is unknown. This also allows the descriptive statistics and the multivariate models that follow to include as many observations for children as possible. It is crucial to maximise observations in this way due to the fact that there is a relatively small proportion of children with disabilities in the data and there is a need to disaggregate for disability type. Maximising observations therefore allows for more robust and representative information for children.

School attendance is current as per the year surveyed and refers to formal schooling as well as home schooling. The variable for school attendance is based on two survey questions, the first being a binary question of whether or not a child is currently attending an educational institution and the second asks

what type of institution they are attending. The dummy variable for school attendance equals one if a child is attending either a formal school or is being home schooled at the time of survey. It is equal to zero if the child is not attending formal school or home school. Table 4.2 presents the mean rate of school attendance for the pooled sample, as well as the annual rates from 2011 to 2017. The overall pooled rates of school attendance among children of compulsory school age are high at 97 percent, but are significantly lower for children with disabilities using the severe (83 percent), UN (87 percent) and multiple (79 percent) measures of disability. School attendance for children with moderate disabilities is almost identical to national average at 97 percent. Therefore, Table 4.2 provides evidence that underscores the motivation for the chapter: children with disabilities are, on average, significantly more likely to be out of school than children without disabilities for several measures of disability.

Table 4.2: School attendance rates and changes over time (2011 to 2017) for children 7 to 15 years

	All	Broad	Moderate	Severe	UN	Multiple
Pooled sample	0.972	0.929***	0.971	0.834***	0.868***	0.794***
	(0.001)	(0.004)	(0.003)	(0.010)	(0.008)	(0.014)
2011	0.973	0.940	0.976	0.869	0.885	0.806
	(0.002)	(0.007)	(0.005)	(0.019)	(0.016)	(0.029)
2012	0.975	0.938	0.976	0.854	0.880	0.803
	(0.002)	(0.008)	(0.006)	(0.020)	(0.016)	(0.031)
2013	0.973	0.923	0.966	0.827	0.863	0.770
	(0.002)	(0.009)	(0.007)	(0.024)	(0.018)	(0.034)
2014	0.969	0.941	0.973	0.860	0.894	0.856
	(0.002)	(0.007)	(0.006)	(0.018)	(0.013)	(0.022)
2015	0.971	0.913	0.966	0.797	0.834	0.750
	(0.002)	(0.009)	(0.008)	(0.023)	(0.018)	(0.030)
2016	0.973	0.928	0.977	0.804	0.859	0.801
	(0.002)	(0.009)	(0.005)	(0.027)	(0.020)	(0.032)
2017	0.973	0.922	0.963	0.830	0.866	0.779
	(0.002)	(0.010)	(0.008)	(0.026)	(0.020)	(0.035)
% change (2011 to 2017)	0	-1.91	-1.33	-4.49	-2.15	-3.35
Sample	105169	10130	6903	3227	4334	1883
Population	64289113	5780020	4019563	1760457	2407628	1121859

Source: Own Calculations, Pooled GHS 2011-2017.

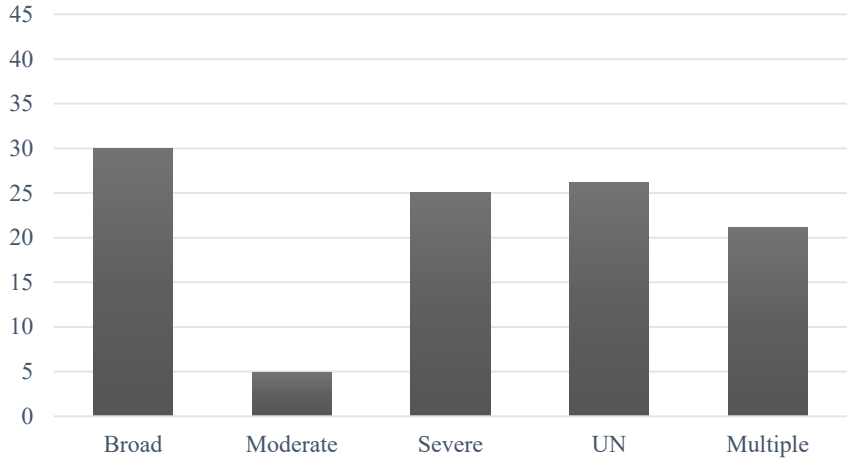
Note: The significance levels highlight the difference between people with disabilities compared to people without disabilities (as defined for each measure): *** significant at the 1% level, ** significant at the 5% level and * significant at the 10% level. Earnings/income values are measured in thousands of Rands per month and are inflation adjusted with 2017 as the base year. Significance tests are not shown for each individual year.

The rate of change in attendance for all children from 2011 to 2017, shown at the bottom of Table 4.2, is zero, with the percentage of children of compulsory school age who are attending school being 97.3 percent in both endpoint years, and very minor fluctuations in between. For each of the disability types, the evidence is rather concerning as the percentage of children attending school in 2017 is lower than

that in 2011. The largest decline in school attendance is for children with severe disabilities whereby the rate of change is close to negative five percent. This represents a decline from 87 percent attendance in 2011 to 83 percent attendance in 2017. For children with multiple disabilities the decline in school attendance from 2011 to 2017 is three and a half percent. In the case of severe disabilities there is a consistent decline in school attendance declines up to 2014 where it rises slightly and then drops again in 2015 and then begins to rise from 2016 to 2017 but never quite reaching the attendance rate of 2011. This pattern is consistent for each measure of disability, where attendance rates rise again slightly in 2014 and then decrease again in 2015 with some fluctuation between 2016 and 2017. However, in each case the 2017 attendance rates are still lower than in 2011 which demonstrates that for all disability measures, there has been a decline in overall school attendance from 2011 to 2017. This is despite inclusive education policies and the right of all children to access education in South Africa. This finding suggests that policy implementation is indeed problematic as the opposite effect should be evident, whereby school attendance for children with disabilities should increase over time due to the country having these policies in place. The multivariate estimation in Section 4.3 will explore whether these concerning trends are significant when controlling for the characteristics of children and their households.

Figure 4.1 aims to shed light on the group of children who are not attending school. There are 740 000 children of compulsory school age who out of school which on average is 105 714 per year (of the seven year pooled sample). Almost one third of these children are children with disabilities according to the broad measure and of these 25 percent have severe disabilities and five percent have moderate disabilities. As discussed in chapter three, the broad measure of disability is made up of both the moderate and severe measures. Using the UN measure of disability (a person has at least two moderate or one severe disability), 26 percent of children who are out of school are children with disabilities and 21 percent of children who are out of school are children with multiple disabilities. Comparing these values to the prevalence rates of childhood disability indicates that children with disabilities are disproportionately out of school compared to children without disabilities, confirming other studies that have found similar results (Filmer, 2008; Fleisch, Shindler & Perry, 2012; Department of Social Development, 2015).

Figure 4.1: The percentage of children who are out of school who have disabilities (7 – 15 years)



Source: Own Calculations, Pooled GHS 2011-2017.

Note: The frequency of children out of school in each category can be divided by seven to represent an average per year.

The GHS asks respondents to indicate directly the main reason they are not currently attending school. The most cited reason for non-attendance among people with disabilities is that their disability prevented them from attending school. These figures are presented in Table 4.3 below and indicate that for 22 percent of all children, disability is reported as the main reason for non-attendance, whereas for those children with disabilities defined by the broad measure, 63 percent report that disability is the main reason for non-attendance. This increases to between 70 and 78 percent for the UN, severe and multiple measures of disability respectively. These summary statistics highlight that disabilities hamper children's school attendance and therefore warrants further investigation in the multivariate analysis in section 4.3.

Table 4.3: The main reason child (7 – 15 years) is not currently attending school

	All	Broad	Moderate	Severe	UN	Multiple
Disability	0.225	0.638	0.227	0.724	0.702	0.778
	(0.017)	(0.031)	(0.061)	(0.030)	(0.030)	(0.029)
Sample	1209	379	64	315	338	265
Population	716252	215517	36954	178563	190493	153789

Source: Own Calculations, Pooled GHS 2011-2017.

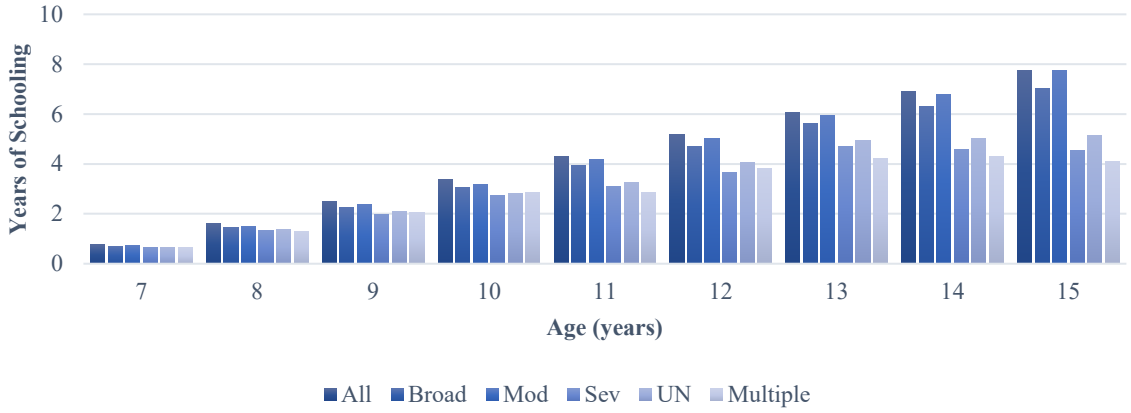
Note: There are a number of other categories that were included in the survey question. These have been omitted here but are included in the Appendix B, Table B1.

This chapter examines both school attendance and school progression as measures of education for children. A few existing older studies have been able to demonstrate a negative relationship between disability and school attendance in South Africa but these studies have not been updated since 2013

(Fleisch, Shindler & Perry, 2012; Mizunoya, Mitra & Yamasaki, 2016; Luo et al., 2020). This thesis aims to extend those studies by using more up to date data as well as using a variety of measures of disability to further demonstrate the relationship and identify the groups of people with disabilities that are most affected by lack of access to schooling. The analysis of school progression that follows is novel in South Africa and the relationship of disability to this outcome has not yet been examined.

To begin, Figure 4.2 highlights the average number of years of schooling attained by each age group in the compulsory school age cohort. This is to allow for comparison between the average number of years overall and the average number of years for children with each measure of disability for each age group. It is noted that for each age, the overall average is higher than each of the measures of disability. Children with moderate disabilities reach similar numbers of years of education as the national average of all children, whereas children with severe, UN and multiple disabilities have the least number of years of education in comparison. As an example, children aged 11 years have just over four years of schooling based on the national average; however, children with multiple disabilities have just less than three years of schooling. This indicates a possible discrepancy in the progression of children with disabilities compared to children without disabilities. Despite the school attendance figures being reasonably high (around 80 percent for children with disabilities), when children with severe disabilities are in school, they are potentially behind their peers.

Figure 4.2: Average number of years of schooling completed by age, for each disability measure



Source: Own Calculations, Pooled GHS 2011-2017.

This observation is explored further through the creation of a categorical variable representing school progression. In this thesis, school progression measures whether children who are attending school are in the expected grade for their age. According to the South African School's Act of 1996, the earliest a child can start school is age five as long as they turn six by 30th June of the year they are admitted; however, children typically begin grade one in the year they turn seven (Department of Education,

1998). Therefore, the assumption that children will be either six or seven years old in grade one is the basis for the variable representing school progression.

Children are considered to be in the expected grade for their age if their age minus their current grade is equal to either five or six. For example, a child who is six years old in grade one or a child who is eleven years old in grade five would be considered to be in the expected grade for their age (six minus one equals five and 11 minus five equals six). Children are considered to be one year behind their peers if the difference between their age and current grade is equal to seven. For example, a child who is eight years old in grade one or a child who is twelve years old in grade five would be considered one year behind in school compared to their peers. Finally, children are considered to be two or more years behind their peers if the difference between their age and current grade is greater than eight. An example of this would be a nine year old in grade one or a 14 year old in grade five. The sample is restricted to children of compulsory school age and thus no children under 7 years of age will be included in the analysis.

However, as described above, it is possible for children to be almost a year younger in each grade depending on whether their birthday falls before or after June 30th in that year. The GHS data does not release the child's date of birth, nor the exact date on which each household was enumerated. The GHS does not ask any questions about the age at which an individual child started school, and therefore it is only possible to track progression based on the statutory age requirements, and not against the individual's own enrolment date. The progression measure should not be treated as an indicator of a child having repeated any grades. For example, a child who begins school early at age five may repeat a grade at a later stage but will be classified as being in the expected grade for their age based on the calculations described above. The measure of progression that is used here is therefore likely to underestimate the extent to which some children fall behind in school, and can be considered a conservative measure of progression given the limitations of the data. Although the measure is referred to as progression, it may equally indicate children who started school later than the statutory requirement and were unable to catch up with their peers.

Table 4.4 presents indicators of school progression for children, including the key progression measure discussed above as well as the extent of absenteeism and grade repetition. In addition, there is an indication of whether a child is attending a public or private institution as well as an indicator for when this information is unknown by the respondant. Based on the national average 77 percent of all children aged 7 to 15 years are considered to be in the expected grade for their age with 13 percent being one year behind and ten percent being two or more years behind. For the broad and moderate measures of disability, 75 and 79 percent of children with disabilities are in the expected grade for their age

respectively. Using the moderate measure of disability, a slightly larger proportion of children are in their expected grade compared to the national average. In the case of the severe, UN and multiple measures, children with disabilities are significantly underrepresented in their expected grade for their age. The proportion of children with multiple disabilities in their expected grade is 16 percent below the national average whereas the proportion of these children who are two years behind is 19 percent higher. On the whole, the proportion of children with disabilities who are two years behind in school is larger for each disability measure except for the moderate measure. These results appear to indicate that children with more severe disabilities are progressing slower on average compared to the full sample of children. All of the progression indicators are significant for children with disabilities compared to children without.

For all children in the sample, Table 4.4 identifies six percent of children who were absent from school in the previous week. Using the broad, moderate or severe measure of disability, close to six percent children with disabilities report absenteeism. However, four percent of children with multiple disabilities report absenteeism. Grade repetition refers to a question that asks whether a child is currently repeating a grade (at the time of survey). This measure does not include children who have repeated a grade in previous years. Here eight percent of the full sample report repetition whereas 11 percent of children with disabilities report absenteeism with the UN and multiple being the lowest at 10 and nine percent respectively. On the whole, the vast majority of children attend public schooling in South Africa (over 90 percent in the full sample) with the remainder attending private schools. The proportion of children attending public school is smallest for people with disabilities at 75 percent. The proportion attending private schools is slightly higher for children with disabilities with the highest rate being seven percent of children with multiple disabilities compared to just under seven percent of children overall. Interestingly, children with severe or multiple disabilities are significantly overrepresented in the groups who report that they do not know whether their school is public or private.

The descriptive statistics clearly indicate that children with disabilities, particularly severe or multiple disabilities are overrepresented in the proportion of children who are two or more years behind their peers in school. It is difficult to ascertain the complete story with regards to progression using descriptive statistics alone, thus the multivariate analysis that follows aims to examine the relationship between disability and school progression to determine whether children with disabilities that are able to attend school are able to progress in a similar trajectory as children without disabilities. For example, Table 4.1 shows that children with disabilities live in more economically deprived households than those without disabilities, which may affect their ability to access and succeed in education. The multivariate analysis allows for the estimation of the relationship between disability and school outcomes whilst controlling for the influence of other relevant factors.

Table 4.4: School progression for children (7 to 15 years), by disability measure

	All	Broad	Moderate	Severe	UN	Multiple
Progression:						
Two+ grades behind	0.097	0.132***	0.085***	0.239***	0.206***	0.288***
	(0.002)	(0.005)	(0.005)	(0.012)	(0.010)	(0.017)
One grade behind	0.134	0.116***	0.123**	0.102***	0.105***	0.098***
	(0.002)	(0.004)	(0.005)	(0.007)	(0.006)	(0.009)
Expected grade	0.769	0.751***	0.792***	0.660***	0.689***	0.614***
	(0.002)	(0.006)	(0.007)	(0.013)	(0.011)	(0.017)
Absent from school	0.051	0.061***	0.063***	0.058	0.053	0.037**
	(0.001)	(0.003)	(0.004)	(0.005)	(0.004)	(0.006)
Repeating a grade	0.078	0.111***	0.111***	0.111***	0.107***	0.088
	(0.001)	(0.006)	(0.006)	(0.008)	(0.008)	(0.009)
Public school	0.916	0.879***	0.913	0.804***	0.827***	0.752***
	(0.002)	(0.005)	(0.005)	(0.011)	(0.010)	(0.017)
Private school	0.063	0.068	0.069	0.065	0.068	0.074
	(0.002)	(0.004)	(0.005)	(0.007)	(0.007)	(0.011)
Unknown public or private	0.021	0.053***	0.018	0.131***	0.105***	0.174***
	(0.001)	(0.003)	(0.002)	(0.009)	(0.007)	(0.014)
Sample	96535	9323	6314	3009	4016	1732
Population	58917502	5323218	3678899	1644319	2230821	1030411

Source: Own Calculations, Pooled GHS 2011-2017.

Note: The sample is restricted to children who are attending school (formal or home school). The significance levels highlight the difference between people with disabilities compared to people without disabilities (as defined for each measure): *** significant at the 1% level, ** significant at the 5% level and * significant at the 10% level.

4.3 Multivariate Analysis

The descriptive statistics presented in the previous section, suggest that children with disabilities are overrepresented in the proportion of those out of school. Attendance at school may also not result in an equal educational experience between children with and without disabilities, because a larger percentage of children with disabilities are behind their peers in school and experience absenteeism or grade repetition. The multivariate analysis for this chapter comprises two models: the first being a probit model for school attendance and the second an ordered probit for school progression. This analysis is again conducted for children of compulsory school-going age (7 to 15 years) using the pooled sample of the GHS from 2011 to 2017.

4.3.1 School Attendance

The first model for school attendance estimates whether children with disabilities are more likely to be out of school compared to children without disabilities, after controlling for other individual and household characteristics that are expected to influence educational outcomes. This model is represented by equation 4.1.

$$\boldsymbol{SA} = \boldsymbol{\alpha}'\boldsymbol{D} + \delta'\boldsymbol{Z} + \gamma'\boldsymbol{H} + \boldsymbol{\varepsilon} \quad (4.1)$$

School attendance, $\boldsymbol{SA}$, is a dichotomous dependent variable that takes on the value of one if a child is attending school and zero otherwise. $\boldsymbol{D}$ refers to the disability indicators, which will include each of the aforementioned measures of disability as well as each specific disability type identified through the WG-SS. $\boldsymbol{Z}$ includes individual demographic characteristics such as race, age and gender. $\boldsymbol{H}$ refers to household characteristics which include geographical location, mother's education, household income and household size. $\boldsymbol{\varepsilon}$ is the error term that is assumed to be independent and normally distributed. It is expected that the coefficients on the disability indicators will be negative and significant showing that children with disabilities are less likely to attend school compared to children with no disabilities, ceteris paribus.

The variables included in the models were predetermined based on other studies that have examined the relationship between disability and school attendance. In these studies, similar binary regression models, namely a logit or probit model were used (Filmer, 2008; Mizunoya, Mitra & Yamasaki, 2016). The potential limitations of estimating the relationship between disability and school attendance include endogeneity problems such as omitted variable bias, measurement error or simultaneity. In the case of omitted variable bias, the data are limited by the questions asked in the GHS. There may be factors that might affect school attendance that are not addressed by this survey such as the motivation of caregivers to provide education for their children. To that end, dummy variables representing the mother's educational attainment and mother's presence in the household have been included to proxy for such unobserved factors (Loaiza, 2005; Branson, Hofmeyr & Lam, 2014; Lamichhane & Kawakatsu, 2015).

Some studies have used household fixed-effects to address this issue and found little difference between the original model and the one using household fixed-effects (Filmer, 2008; Mizunoya, Mitra & Yamasaki, 2016). This implies that the impact of disability exclusion on school attendance is a direct effect and not necessarily the result of omitted variable bias. Measurement error arises when one or more of the explanatory variables are measured incorrectly, for example, if caregivers responded inaccurately to the disability questions. Simultaneity occurs when one or more of the explanatory variables is jointly determined with the dependant variable (school attendance) again increasing the error term. An example of this would be parental neglect which is correlated with both school attendance and disability (Mizunoya, Mitra & Yamasaki, 2016). These latter two issues are not explicitly addressed in this study; however, the limitations of the questionnaire, particularly the use of the WG-SS for children have been discussed in chapter three.

The probit model for school attendance is estimated in three different iterations to determine whether the impact of disability on school attendance is affected by the inclusion of additional individual and household level explanatory variables. If effect of disability on school attendance remains consistent and significant upon the inclusion of these controls, this will indicate the robustness of the relationship between disability and school attendance, ceteris paribus. The first specification (I) only includes the impact of disability and age on school attendance. Age is included in each of the three specifications given that age is correlated with disability and age is also a key predictor of school attendance. Children are expected to attend school after a certain age, namely from the year they turn seven. Generally, disability is part of the normal ageing process but childhood disabilities are likely to be acquired at birth or due to illness or injury at a young age. The next specification (II) includes the additional **Z** variables and the third specification (III) also includes the **H** variables.

The magnitudes of the coefficients on the explanatory variables are not directly interpretable in a probit estimation, although the signs and significance of the coefficients provides an indication of the nature of the relationship between the explanatory variables and the independent variable. The sign represents the direction in which the probability changes. For example, a negative sign on the disability variables will indicate that the probability of school attendance decreases if the child has a disability relative to a child without disability. In order to present coefficient values that are themselves interpretable, the average marginal effects are calculated after the probit estimation. The marginal effects indicate the magnitude (in percentage points, p.p.) of the relationship of the explanatory variables to the probability of school attendance.

The marginal effects are presented in Table 4.5 below, while the probit model coefficients can be found in the Appendix B, Table B2. The probit model was estimated separately for each of the main disability measures, namely broad, moderate, severe, UN and multiple. In each case, the model has three specifications I, II and III. The first specification includes only the relevant disability indicator and the age variables, the second includes additional demographic variables, namely as gender and race and the final specification includes all of the explanatory variables including the household level characteristics. These three model specifications are used to determine whether any of the explanatory variables may jointly determine school attendance along with the disability indicators. If the marginal effects remain consistent then the disability indicators are directly responsible for the effect on school attendance. The magnitudes and significance of the disability and age marginal effects do not change when the controls for gender and race are added, for any disability measure. Therefore, for brevity, only specifications I and III are shown in the text with the full results of the marginal effects presented in Appendix B, Table B3.

The following detailed discussion examines the marginal effects calculated from the probit model for children with disabilities as given by the broad measure of disability (at least one moderate or one severe disability type) presented in the first two columns of Table 4.5. Differences observed for the other disability measures are noted afterwards. The marginal effects of disability are consistent across model specifications I, II and III at -0.038 and are highly significant at the one percent level. This means that children with disabilities (broad measure) are 3.8 percentage points (p.p.) less likely to attend school compared to children without disabilities. Controlling for other factors does not decrease the extent to which children with disabilities are out of school, and therefore non-attendance among children with broad disabilities is not explained by factors such as lower socioeconomic status. As expected, the marginal effect of age is positive and significant at the one percent level indicating the probability of school attendance increases with age. However, age squared is negative indicating that school attendance rises at a decreasing rate.

The probability of school attendance is reduced by half a percent if a child is living in an urban area relative to a rural area. This is statistically significant but it is contrary to expectations where the literature suggests that children in urban areas are more likely to attend school. This implies that there are no attendance disadvantages in rural areas when controlling for a range of demographic and socioeconomic characteristics. All of the mother's education variables are positive and significant, including if the mother has no schooling. When a mother's education information is missing, the coefficients are negative and insignificant. This implies that the availability of information from the mother is perhaps relative to an unobserved factor such as their involvement in the household, which itself is a driver of whether or not a child with disabilities is attending school. The probability of a child's school attendance is largest if their mother has matric. The reference category is this case is if a mother has tertiary education. The marginal effect of a mother living in the household is negative and significant signalling that children are less likely to attend school if their mother is living in the household compared to if their mother does not live in the household. This is again contrary to expectations; however, can potentially be a result of the mother living in the household to care for the child and therefore choosing not to send them to school.

Table 4.5: The probability of school attendance for children 7 to 15 years (marginal effects) by disability measure

	Broad		Moderate		Severe		UN		Multiple	
	I	III	I	III	I	III	I	III	I	III
Disability	-0.038***	-0.038***	-0.002	-0.002	-0.071***	-0.071***	-0.062***	-0.061***	-0.079***	-0.077***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.005)	(0.004)	(0.004)	(0.004)	(0.005)	(0.005)
Age	0.025***	0.025***	0.028***	0.029***	0.025***	0.025***	0.025***	0.025***	0.026***	0.026***
	(0.002)	(0.002)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)
Age Squared	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
African		0.011**		0.012**		0.011**		0.011**		0.010**
		(0.005)		(0.005)		(0.005)		(0.005)		(0.005)
Coloured		-0.003		-0.001		-0.004		-0.001		-0.002
		(0.005)		(0.005)		(0.005)		(0.005)		(0.005)
Indian		0.011		0.011		0.011		0.012*		0.011
		(0.007)		(0.007)		(0.007)		(0.007)		(0.007)
Male		-0.002		-0.002*		-0.002		-0.002		-0.002
		(0.001)		(0.001)		(0.001)		(0.001)		(0.001)
Urban		-0.005**		-0.005**		-0.005**		-0.005**		-0.005**
		(0.002)		(0.002)		(0.002)		(0.002)		(0.002)
Mother missing education info		-0.002		-0.004		-0.000		0.000		-0.001
		(0.008)		(0.008)		(0.009)		(0.008)		(0.008)
Mother has no schooling		0.009**		0.007*		0.009**		0.009**		0.009**
		(0.004)		(0.004)		(0.004)		(0.004)		(0.004)
Mother has primary education		0.020***		0.017***		0.019***		0.019***		0.019***
		(0.004)		(0.004)		(0.004)		(0.004)		(0.004)
Mother has some secondary education		0.023***		0.022***		0.023***		0.023***		0.023***
		(0.004)		(0.004)		(0.004)		(0.004)		(0.004)
Mother has matric		0.021***		0.019***		0.021***		0.022***		0.022***
		(0.004)		(0.004)		(0.004)		(0.004)		(0.004)
Mother part of household		-0.010***		-0.010***		-0.010***		-0.009**		-0.010***
		(0.004)		(0.004)		(0.004)		(0.004)		(0.004)
Number of children <15 years		0.004***		0.004***		0.003***		0.004***		0.003***
		(0.001)		(0.001)		(0.001)		(0.001)		(0.001)
Number of adults (16-59 years)		-0.000		-0.000		-0.000		-0.001		-0.001
		(0.001)		(0.001)		(0.001)		(0.001)		(0.001)
Number of older adults 60+		0.006***		0.007***		0.005**		0.004**		0.004**
		(0.002)		(0.002)		(0.002)		(0.002)		(0.002)

Western Cape		0.009**		0.010***		0.010***		0.009**		0.008**
		(0.004)		(0.003)		(0.004)		(0.004)		(0.003)
Eastern Cape		0.013***		0.012***		0.013***		0.015***		0.015***
		(0.003)		(0.003)		(0.003)		(0.003)		(0.003)
Northern Cape		0.021***		0.018***		0.023***		0.022***		0.018***
		(0.004)		(0.003)		(0.004)		(0.004)		(0.004)
Free State		0.012***		0.010***		0.012***		0.012***		0.011***
		(0.003)		(0.003)		(0.003)		(0.003)		(0.003)
KwaZulu-Natal		0.008***		0.008***		0.008***		0.009***		0.008***
		(0.003)		(0.003)		(0.003)		(0.003)		(0.003)
North West		0.005		0.003		0.006		0.006*		0.004
		(0.004)		(0.004)		(0.004)		(0.004)		(0.004)
Mpumalanga		0.018***		0.016***		0.019***		0.019***		0.016***
		(0.003)		(0.003)		(0.003)		(0.003)		(0.003)
Limpopo		0.012***		0.010***		0.013***		0.013***		0.011***
		(0.004)		(0.003)		(0.004)		(0.004)		(0.004)
Earnings from employment		0.000		0.000		0.000		0.000		0.000
		(0.000)		(0.000)		(0.000)		(0.000)		(0.000)
Earnings from employment squared		0.000		0.000		0.000		0.000		0.000
		(0.000)		(0.000)		(0.000)		(0.000)		(0.000)
Other income		-0.000***		-0.000***		-0.000***		-0.000***		-0.000***
		(0.000)		(0.000)		(0.000)		(0.000)		(0.000)
Grant income		-0.004***		-0.005***		-0.003***		-0.003***		-0.003***
		(0.001)		(0.001)		(0.001)		(0.001)		(0.001)
2012		0.004		0.003		0.004		0.003		0.003
		(0.003)		(0.003)		(0.003)		(0.003)		(0.003)
2013		0.000		-0.000		-0.000		0.002		0.002
		(0.003)		(0.003)		(0.003)		(0.003)		(0.003)
2014		-0.005		-0.004		-0.005		-0.004		-0.003
		(0.003)		(0.003)		(0.003)		(0.003)		(0.003)
2015		-0.001		-0.002		-0.001		-0.000		0.000
		(0.003)		(0.003)		(0.003)		(0.003)		(0.003)
2016		-0.000		-0.001		-0.001		0.000		0.001
		(0.003)		(0.003)		(0.003)		(0.003)		(0.003)
2017		-0.001		-0.001		-0.002		-0.001		-0.000
		(0.003)		(0.003)		(0.003)		(0.003)		(0.003)
F-statistic	163	19	61	11	256	27	228	25	235	26
Prob < F	0	0	0	0	0	0	0	0	0	0

Sample	102693	102693	102693	102693	102551	102551	105169	105169	105169	105169
Population	62710704	62710704	62710704	62710704	62618361	62618361	64289113	64289113	64289113	64289113

Source: Own Calculations, Pooled GHS 2011-2017.

Note: Standard errors are in parentheses. *** significant at the 1% level, ** significant at the 5% level and * significant at the 10% level. Earnings/income values are measured in thousands of Rands per month and are inflation adjusted with 2017 as the base year. The reference categories are no disability, White, female, rural, mother has tertiary education, mother is not part of the household, Gauteng, and 2011.

Variables representing household size (children 15 and under and adults 60 and older) indicate that the probability of school attendance increases slightly as the household size increases with respect to children under 15 years and adults over 60 years. These are highly significant at the one percent level. With regards to the province dummy variables, all of them are positive and significant with respect to the omitted reference variable representing Gauteng. This is with the exception of the North West province which is not significant at all. This means that children in all other provinces are more likely to attend school compared to children living in Gauteng. Other income and grant income are negative and highly significant which indicate that children that live in households that received grant income or income from remittances and pensions are less likely to be attending school. Grant recipients may be representative of households living in poorer socioeconomic circumstances. In addition, having greater earned income does not significantly influence the probability of attending school. The model includes controls for the year in which the pooled GHS data were collected. Although the year marginal effects are typically negative, none of the data year variables are statistically significant, suggesting that there is no significant trend in attendance after controlling for other factors.

The next set of models (columns three and four) includes all of the same explanatory variables, but replaces the disability indicator with the moderate measure of disability. Again, the estimate on the disability indicator is stable upon inclusion of additional explanatory variables at -0.002. Here, the marginal effects of disability are negative but small and insignificant compared to children without disabilities. The other explanatory variables that exhibit a significant relationship with the probability of school attendance are similar to those discussed for the broad measure of disability. The exception is in this case, the probability of school attendance is significantly lower for male children compared to female children although by less than half a percentage point.

The third set of models depicting the relationship between disability and school attendance uses the severe measure of disability. Children with disabilities in this instance are seven percentage points (p.p.) less likely to attend school compared to children without disabilities. For children with disabilities as measured by the UN measure (at least two or more moderate or one severe disability) the probability of school attendance is six p.p. lower (-0.062) compared to children without disabilities. Finally, children with multiple disabilities have a close to eight p.p. (-0.079) lower probability of school attendance compared to children with no disabilities. In all cases, the marginal effects are stable across iterations I, II and III (they do not change) and for the broad, severe, UN and multiple measures, are highly significant at the one percent level. The sign and significance of the marginal effects of the additional individual and household level explanatory variables in each iteration are consistent across each of the models representing the different measures of disabilities.

On the whole, Table 4.5 indicates that for each of the measures of disability except for the moderate measure, the probability of school attendance for children with disabilities is lower compared to children without disabilities. The largest effect on school attendance is found for children with multiple disabilities who are eight p.p. less likely to attend followed by children with severe disabilities who are 7 p.p. less likely to attend. As discussed in the descriptive statistics in section 4.2, the overall school attendance rates for children of compulsory school age are very high; however, children with severe or multiple disabilities were identified as having the largest percentage of children out of school. The multivariate results illustrate that disability has a large independent relationship with school attendance, once other factors relating to the child's socioeconomic status are controlled for. The results of the probit estimation therefore provides evidence to suggest that disability has a significant relationship with school attendance overall and specifically for those with severe or multiple disabilities.

The relationship between disability type and school attendance is explored in the next table. The intention is to highlight the disability types that are most vulnerable to better ascertain the difficulties faced by children with disabilities and where resources need to be focused. The probit model is estimated by including all of the disability types in the same model, with separate variables for moderate and severe difficulties for each of the six domains of functioning. The domains of functioning are visual, hearing, physical, communication, cognition and self-care. In the case of this model, the base category refers to children without disabilities. The model estimates the independent role of each disability type and severity, although in practice children may have more than one disability. In addition to these disability type indicators, the probit estimation also included all of the same explanatory variables that were included in Table 4.5 above. In the same manner as previously described, the model was estimated in three separate iterations (I, II and III). The full probit model is presented in the Appendix B4, Table A4.3 along with the full table of marginal effects calculated after estimation of the probit model in Table A4.4. Table 4.6 presents only the marginal effects of each disability type on the probability of school attendance.

As for Table 4.5, the marginal effects for each disability type are consistent across all three model specifications. This implies that the magnitude of association between disability and school attendance is robust across model specifications as they do not change upon inclusion of additional explanatory variables. All of the severe measures of the disability types have negative and significant marginal effects, which indicates that the probability of school attendance is less likely if a child has a severe disability, irrespective of the disability type (visual, hearing, physical, communication, cognitive and self-care). The disability types with the largest negative relationship with the probability of school attendance are severe cognitive and severe communication difficulties. Children with severe cognitive difficulties are seven p.p. less likely to be attending school compared to children without disabilities.

The probability of school attendance is reduced by almost six p.p. for children with severe communication difficulties. Children with severe physical difficulties or moderate communication difficulties are three p.p. less likely to attend school. Communication and cognitive difficulties appear to have the most notable effect on school attendance, with both the moderate and severe measures of these disability types being significant in this model. Whilst all of the disability types are significant with respect to the severe measures, these two are the only moderate disability types that have a significant effect on school attendance.

Table 4.6: Probit model estimating the relationship between disability and school attendance for children 7 to 15 years, by disability type (marginal effects)

	I	II	III
Sight (Moderate)	0.003	0.003	0.003
	(0.005)	(0.005)	(0.005)
Sight (Severe)	-0.022**	-0.022**	-0.023**
	(0.010)	(0.011)	(0.011)
Hearing (Moderate)	-0.003	-0.003	-0.003
	(0.007)	(0.007)	(0.007)
Hearing (Severe)	-0.021*	-0.021*	-0.021*
	(0.011)	(0.011)	(0.011)
Physical (Moderate)	0.004	0.004	0.002
	(0.010)	(0.010)	(0.010)
Physical (Severe)	-0.033***	-0.033***	-0.033***
	(0.009)	(0.009)	(0.009)
Communication (Moderate)	-0.029***	-0.030***	-0.029***
	(0.008)	(0.008)	(0.008)
Communication (Severe)	-0.056***	-0.057***	-0.055***
	(0.008)	(0.008)	(0.008)
Cognitive (Moderate)	-0.017***	-0.016***	-0.015***
	(0.006)	(0.006)	(0.006)
Cognitive (Severe)	-0.069***	-0.069***	-0.067***
	(0.007)	(0.007)	(0.007)
Self-Care (Moderate)	0.002	0.002	0.002
	(0.004)	(0.004)	(0.004)
Self-Care (Severe)	-0.018***	-0.019***	-0.019***
	(0.005)	(0.005)	(0.005)
F-statistic	62	48	22
Prob < F	0	0	0
Sample	102425	102425	102425
Population	62550249	62550249	62550249

Source: Own Calculations, Pooled GHS 2011-2017.

Note: Standard errors are in parentheses. *** significant at the 1% level, ** significant at the 5% level and * significant at the 10% level. Earnings/income values are measured in thousands of Rands per month and are inflation adjusted with 2017 as the base year. The reference categories are no disability, White, female, rural, mother has tertiary education, mother is not part of the household, Gauteng, and 2011.

4.3.2 School Progression

The second education outcome estimated for children is their progression through schooling. This model aims to determine the extent to which children with disabilities are more likely to be behind in school compared to children without disabilities, after controlling for other individual and household level characteristics. The equation is estimated as follows where SP refers to school progression, as

defined below, and the D, Z and H variables are the same disability, individual and household indicators as discussed for equation 4.1.

$$\boldsymbol{SP} = \boldsymbol{\alpha'D} + \boldsymbol{\delta'Z} + \boldsymbol{\gamma'H} + \boldsymbol{\varepsilon} \quad (4.2)$$

The variable SP is an ordered categorical variable which assumes that the higher the value, the better the outcome. Thus SP takes on the value of zero if a child is two or more years behind their peers, one if a child is one year behind their peers and two if a child is in the expected grade for their age. Children are considered to be two or more years behind their peers if the difference between their age and current grade is greater than or equal to eight. Children are considered to be one year behind their peers if the difference between their age and current grade is equal to seven and children are considered to be in the expected grade for their age if their age minus their current grade is equal to either five or six. Given the limitations of this calculation, as discussed in section 4.2, this is considered to be a conservative measure of progression.

The descriptive statistics identified a significant difference in the proportion of children behind their peers in school when comparing children with disabilities and the national average. This was particularly evident for children with severe or multiple disabilities. Children with disabilities also appear to be overrepresented in the cohorts of children who are absent from school or repeating a grade. The variables that represent absenteeism and grade repetition are limited in that these questions are only asked for the given survey period in that particular year. Therefore, if someone reports being absent from school, it refers to the previous week prior to the questionnaire being administered to the household whereas the child may have had multiple bouts of absenteeism over the school year. The school progression indicator, though itself a conservative measure, is a good indicator of cumulative progress as it is based on a child's age and the grade they are attending. This provides a wider overview of progression issues because it is taking more information into consideration and not just that available at the time of the survey. The multivariate analysis will allow for an estimate of the direct relationship between disability and school progression whilst holding all other relevant factors such as race, gender and socioeconomic status constant. This will offer a fuller understanding of how children with disabilities are progressing in school compared to their peers without disabilities.

The school progression indicator represents an ordered categorical variable where the categories are ordinal but not continuous. As such an ordered probit model will be used to estimate the relationship between disability and school progression. An ordered probit model assumes a latent continuous variable (y*) underlying the ordinal responses (Greene, 2012). There are assumed to be cut-off points along this continuous line that corresponds to the ordinal categories. The latent continuous variable y*

is a linear combination of the explanatory variables and the error term which is assumed to be normally distributed. An ordered probit estimation is concerned with how changes in the predicted explanatory variables (α, δ and γ in equation 4.2) translate into the probability of observing a particular ordinal outcome (SP = 0, 1 or 2). The coefficients on the ordered probit model are themselves not easily interpreted thus favouring the calculation of marginal effects (Greene, 2012). In this case, the marginal effects of disability on the probability of the child having each progression outcome will be presented in Table 4.7 below. The marginal effects are shown only for the disability indicators, for brevity, although the full set of coefficients of all the explanatory variables included in the ordered probit models can be found in Appendix B, Tables B5 and B6.

Table 4.7, first presents the composite disability measures. For each of these disability measures, the model was estimated separately. The first model included the broad measure of disability and indicates that the probability of children with disabilities being in the expected grade for their age is five percentage points (p.p.) lower than children without disabilities. Children with disabilities are two p.p. more likely to be either one year or two years behind their peers without disabilities. All of these marginal effects are significant at the one percent level. The magnitude of the association between disability and school progression is lower for children with moderate disabilities; however, the marginal effects are still highly significant and the direction of the effects are the same as discussed for the broad measure.

Children with moderate disabilities are one percent more likely to be behind their peers without disabilities in school and are two percent less likely to be in the expected grade. Children with severe disabilities are 10 p.p. less likely to be in their expected grade for their age compared to children without severe disabilities. They are also six p.p. more likely to be two or more years behind their peers without disabilities. These marginal effects are once again significant at the one percent level. The UN measure includes children with at least either two or more moderate or one severe disability. Using this measure, the probability of children with disabilities being in the expected grade for their age is nine p.p. below children without disabilities. The likelihood of children with disabilities being two or more grades behind is five p.p. Of all the composite disability measures, multiple disabilities have the largest effect on school progression for children. Children with multiple disabilities are 12 p.p. less likely to be in their expected grade for their age and seven p.p. more likely to be two or more years behind their peers without multiple disabilities. All of the marginal effects are significant at the one percent level. In general, relative to children without disability, having a disability by any measure is associated with a larger probability of being two or more years behind in school compared to being one year behind.

Table 4.7: Ordered probit for school progression for children 7 to 15 years (showing marginal effects), by disability measure

	Progression Outcomes			Model Fit			
	Expected grade	1 year behind	2+ years behind	F-statistic	Prob < F	Sample	Population
Composite Disability Measures (one model per measure):							
Broad	-0.050***	0.021***	0.029***	130	0	94261	57473697
	(0.004)	(0.001)	(0.003)				
Moderate	-0.018***	0.007***	0.011***	122	0	94261	57473697
	(0.004)	(0.001)	(0.002)				
Severe	-0.101***	0.043***	0.058***	132	0	94132	57390723
	(0.007)	(0.003)	(0.005)				
UN	-0.088***	0.037***	0.051***	133	0	96535	58917502
	(0.006)	(0.002)	(0.004)				
Multiple	-0.120***	0.050***	0.070***	133	0	96535	58917502
	(0.010)	(0.003)	(0.007)				
Disability Types (single model):				106	0	94016	57326788
Sight (Moderate)	0.015**	-0.007**	-0.009**				
	(0.006)	(0.003)	(0.003)				
Sight (Severe)	0.011	-0.005	-0.006				
	(0.013)	(0.006)	(0.007)				
Hearing (Moderate)	-0.029***	0.012***	0.016***				
	(0.007)	(0.003)	(0.004)				
Hearing (Severe)	-0.048***	0.020***	0.027***				
	(0.018)	(0.008)	(0.010)				
Physical (Moderate)	0.033**	-0.014**	-0.019**				
	(0.014)	(0.006)	(0.008)				
Physical (Severe)	-0.058***	0.025***	0.033***				
	(0.017)	(0.007)	(0.010)				
Communication (Moderate)	-0.017	0.007	0.010				
	(0.013)	(0.006)	(0.008)				
Communication (Severe)	-0.079***	0.034***	0.045***				
	(0.016)	(0.007)	(0.009)				
Cognitive (Moderate)	-0.058***	0.025***	0.033***				
	(0.008)	(0.003)	(0.005)				
Cognitive (Severe)	-0.136***	0.059***	0.078***				
	(0.014)	(0.005)	(0.009)				
Self-Care (Moderate)	-0.009*	0.004*	0.005*				

	(0.005)	(0.002)	(0.003)
Self-Care (Severe)	-0.034***	0.015***	0.020***
	(0.006)	(0.003)	(0.004)

Source: Own Calculations, Pooled GHS 2011-2017.

Note: Standard errors are in parentheses. *** significant at the 1% level, ** significant at the 5% level and * significant at the 10% level. Earnings/income values are measured in thousands of Rands per month and are inflation adjusted with 2017 as the base year. The reference categories are no disability, White, female, rural, mother has tertiary education, mother is not part of the household, Gauteng, and 2011.

The second half of Table 4.7 presents the disability types. As before, all of these variables (including both the moderate and severe versions of each domain of functioning) are included in the same model, to assess any independent relationships. The moderate and severe sight difficulties and moderate physical difficulties operate in the opposite direction to all of the other disability measures. The marginal effects of moderate sight disabilities are significant at the five percent level and indicate that children with moderate sight disabilities are more likely to be in the expected grade for their age and less likely to be behind their peers without disabilities in school. This finding suggests that moderate sight disabilities are easier to accommodate in the school environment than other disability types. The marginal effects of severe sight disabilities are insignificant, while the marginal effects of moderate physical disabilities are significant at the 10 percent level and also demonstrate that children with moderate physical disabilities (has some difficulty walking a kilometre or climbing a flight of stairs) are more likely to be in their expected grade and less likely to be behind children with no disabilities in school. Given that this is only some difficulty, it may also be easier accommodated in school in terms of day-to-day learning and may only slightly impact physical activities.

The marginal effects of the remaining disability types exhibit the expected directional relationship between disability and school progression. Children with severe hearing difficulties are 5 p.p. less likely to be in the expected grade for their age compared to children without disabilities and are two percentage points more likely to be one year and three p.p. more likely to be two or more years behind their peers in school. This is significant at the one percent level. The marginal effects of severe physical and moderate cognitive difficulties are the same whereby children are six p.p. less likely to be in their expected grade for their age and three percent more likely to be either one or two (or more) years behind their peers in school. Again, these effects are highly significant at the one percent level.

The largest marginal effects of disability on school progression occur for children with severe cognitive or communication difficulties. Children with severe communication difficulties are eight p.p. less likely to be in the expected grade for their age, three p.p. more likely to be one year behind and five p.p. more likely to be two or more years behind their peers without disabilities. Children with severe cognitive

difficulties are 14 percentage points less likely to be in the expected grade for their age and are six p.p. more likely to be one year behind or eight p.p. more likely to be two or more years behind their peers in school. All of these marginal effects are significant at the one percent significance level.

In terms of the additional explanatory variables in the original probit estimation (Appendix B, Table B5 and B6) there are some interesting differences compared to the analysis of school attendance. Male children progress slower than female children and children in urban areas do better in terms of progression compared to children in rural areas. Progression improves with the household's income from employment, although at a decreasing rate. This suggests that greater household resources can assist children to progress through schooling. Progression is also somewhat better in 2013 and significantly better in 2016 and 2017, relative to 2011, suggesting some general positive trends over the years. Whilst this appears to be a positive finding, children with disabilities require close monitoring because as the marginal effects suggest, children with disabilities are more likely to fall behind their peers in school.

On the whole these results indicate that even if children with disabilities are attending school, their progression is not in line with their peers without disabilities. In most instances, the probability of children with disabilities being in their expected grade for their age is lower compared to children without disabilities. The probability of children being behind in school (relative to their age) is greater for children with disabilities compared to children without and the marginal effects are largest in the case of two or more years behind. The largest effect is seen for children with multiple disabilities, whereby they are seven p.p. more likely to be two or more years behind in school, and for children with severe cognitive difficulties who are eight p.p. more likely to be two or more years behind in school.

4.4 Concluding Comments

Children's access to schooling has been identified as a global issue and has consequently been placed on the policy agenda for various countries including South Africa. Many children with disabilities have been left behind in the education agenda which may be attributed to negative attitudes towards children with disabilities, inaccessible schools and learning environments, a lack of resources and knowledge, and the inefficient implementation of inclusive education policies. Previous studies have shown that a third of children who are out of school in South Africa are children with disabilities (Filmer, 2008; Fleisch, Shindler & Perry, 2012; Department of Social Development, 2015; Mizunoya, Mitra & Yamasaki, 2016). South Africa's policy towards inclusive education indicates the intention to improve this situation, but implementation is problematic (Department of Basic Education (DBE), 2010; Dalton, Mckenzie & Kahonde, 2012; Mizunoya, Mitra & Yamasaki, 2016). Much of the exclusion of children with disabilities from education can be attributed to the lack of monitoring of children with disabilities

and their educational outcomes. In addition, detailed analysis that pays attention to the need to disaggregate via disability type and degree and control for other factors that may impact education, has been lacking. However, such analysis is needed to inform policy implementation and point towards who is excluded from and who is struggling to progress at school. Despite policy, there has been limited data that seeks to identify which children are left behind in terms of attendance and progression in school. In order to inform policy and support the meaningful inclusion of children with disabilities who are left behind, more detailed monitoring and evaluating of the data is needed.

This thesis therefore contributes to the existing body of literature by offering an up to date and disaggregated analysis of school attendance for children with disabilities. It also provides a disaggregated analysis of school progression, which is the first of its kind for South Africa. The analysis is done using a seven year pooled sample of the General Household Survey (GHS), a survey that includes detailed information on education as well as the Washington Group Short Set of questions on disability (WG-SS). Whilst this WG-SS is not specific to children and a Child Functioning Module has recently been developed by the WG, it has yet to be included in any of the South African household surveys. The measurement of disability here is therefore considered to be conservative but this limitation is addressed to the best of the available circumstances through the use of multiple measures of disability so as to provide a broad overview of childhood disability in South Africa.

The findings of the descriptive statistics presented in section 4.2 confirm previous research and that at a national level, children with disabilities who are of compulsory school age (7 to 15 years) are disproportionately out of school compared to children without disabilities and corroborates that one third of children who are out of school are children with broadly measured disabilities (Fleisch, Shindler & Perry, 2012; Department of Social Development, 2015). Furthermore, the percentage of children with disabilities who are attending school declined slightly from 2011 to 2017. In particular, school attendance rates for children with severe disabilities in 2017 are almost five percent lower than in 2011, whereas the national average has not changed over time. In addition, children with disabilities, particularly severe or multiple disabilities are overrepresented in the group of children who are two or more years behind their peers in terms of school progression. Children with disabilities also report absenteeism and grade repetition rates greater than the national average. These findings raise concerns regarding the access to schooling and the equality of the learning experience when children with disabilities are able to attend.

The multivariate analysis in section 4.3 is divided into two sub-sections, the first addressing the relationship between disability and school attendance and the second addressing the link between disability and school progression. For all measures of disability except for moderate disabilities, the

probability of school attendance is significantly lower for children with disabilities compared to children without disabilities. Children with multiple disabilities and children with severe disabilities are the most disadvantaged in this area as the probability of school attendance is eight and seven percentage points below children without disabilities respectively. Whilst all children with severe forms of disabilities, as indicated by the analysis of disability type in Table 4.6, are significantly less likely to attend school compared to children without disabilities, it is those with severe cognitive or communication difficulties that are the most disadvantaged. Severe cognitive difficulties reduce the likelihood of school attendance by seven p.p. and severe communication difficulties by six p.p.

The analysis of school progression presented in this thesis is novel and the school progression indicator is considered to be a conservative measure due to the limitations of the data. Nonetheless, the results indicate that children with disabilities are significantly less likely to be in the expected grade for their age and are more likely to be behind their peers in school. Children with multiple or severe disabilities are the most disadvantaged whereby they are seven or six p.p. more likely to be two or more years behind in school compared to children without disabilities. Interestingly, moderate sight and moderate physical disabilities appear to be easier to accommodate in the school environment as the results suggest that children reporting these disability types are more likely to be in the expected grade for their age and are less likely to be behind their peers without disabilities. The largest effect is once again experienced by children with severe cognitive difficulties who are eight p.p. more likely to be two or more years behind in school. For children with severe communication difficulties the probability of being two or more years behind is five p.p. greater than children without disabilities.

Children with disabilities may be behind their peers because they started school late but may still have been able to progress at the expected rate thereafter. Based on the available data, it is impossible to establish the extent to which children have indeed enrolled in education later than expected. Policies to improve progression of children with disabilities relative to their peers might need to address the child's school readiness and access to reasonable accommodation once they are attending. In addition, children with disabilities may have had schooling interruptions (due to absenteeism) and therefore needed to repeat certain grades, thus causing them to fall behind their peers.

Although all children with disabilities are disadvantaged in their school attendance and progression, the magnitude of the disadvantage depends on the nature of their disability. This finding is unique to this thesis given that disability has been measured in multiple different ways and the models are therefore able to demonstrate which groups of children require more focus in terms of educational policy.

Basic education is considered a fundamental human right yet children with multiple or severe disabilities, and in particular severe cognitive or communication difficulties, have trouble accessing education and progressing through education in line with their peers. The results of this analysis indicate that despite policy guidelines towards inclusive education, South African children with disabilities are still excluded in the manners discussed in this chapter (school attendance and progression). This suggests that very little progress has been made over the last few years to implement the vision of inclusive education. Other studies have provided insight on the difficulties of implementation of such policies and suggest that a lack of resources, knowledge and support are the main impeding factors (Dalton, Mckenzie & Kahonde, 2012; Deghaye, 2021). However, this thesis also suggest that knowing who is truly left behind is essential to overcome barriers to access of education.

The need to monitor and evaluate the educational experience of children with disabilities in all their diversities is crucial to ensure that policy implementation is appropriate and efficient. Monitoring is especially imperative in childhood so as to limit the potential long run labour market costs from occurring thereafter. These long run labour market costs will be discussed in chapter five. This thesis therefore contributes significantly towards the monitoring of children with disabilities by providing insights in terms of school attendance and progression. For example, if children with severe disabilities start school late then specific efforts have to be made in early intervention at preschool age to identify and prepare these children for school. If children with communication and cognitive disabilities are those that are left behind then this speaks to a potential lack of the necessary training required to ensure teachers are able to address the needs of children with these difficulties (rather than changing the physical environment through accommodations such as the building of ramps). It should be noted that physical accessibility elements such as ramps are monitored in the school surveys, but teacher training with regards to children with disabilities is not. Teachers often cannot identify learners needs and are also not trained in the appropriate teaching methods needed for these learners (Deghaye, 2021).

Chapter Five

The relationship between disabilities in adulthood, educational attainment and labour market outcomes.

5.1 Introduction

Historically, people with disabilities have faced discrimination in the labour market and thus typically have undue high levels of unemployment. When they are able to access jobs, they are usually selected into low paying or low status jobs (SAHRC, 2015; International Centre for Evidence in Disability, 2017). People with disabilities encounter significant barriers to access the workplace, including negative attitudes, a lack of reasonable accommodation and resources, and increased costs related to healthcare, transport, assistive devices and personal assistance. In addition, limited access to education and health services can affect someone's entry into the workforce (SAHRC, 2015; Department of Social Development, 2016). The Convention on the Rights of Persons with Disabilities (CRPD) highlights the importance of mainstreaming disability rights; however, implementation of this, particularly in South Africa, is slow and people with disabilities still remain vulnerable to lower levels of employment (SAHRC, 2015).

The impact of disability on people's labour market experience is multifaceted and this chapter aims to provide some insight into this matter within the parameters of household survey analysis. A person's labour market experience depends on many factors including the person's disability itself and the environment or society that may further disable people in their access to the labour market. A disability that is acquired later in life, when a person is older may affect their ability to perform their existing job and may potentially result in early retirement or job loss. Alternatively, early onset disability may (as discussed in chapter four) impede a person's educational attainment which in turn affects their employability at the outset of their working life (Graham et al., 2014).

Early economic theory of employment assumed that employers consider only the productivity of employees and that workers do not consider the characteristics of those they work with (Becker, 1993). However, discrimination has always existed and Becker (1971) in his seminal work noted that observable discrimination in terms of wages and employment depends on tastes for discrimination, the degree of competition in the market and civil rights legislation. In practice, discrimination in market work against minority groups depends on the overall culture or environment. It is the result of the combined discrimination of employers, workers, consumers, schools and governments (Becker, 1971,

1993). As outlined in chapter two, South Africa has developed relevant legislation to protect people with disabilities from discrimination, but the promotion of these rights is often lacking particularly in areas such as access to education and the workplace. This discrimination is embedded in the lack of provision of reasonable accommodation as well as negative attitudes or stigma. Becker (1993) notes that when the majority group discriminates against the minority, market discrimination does not affect the incomes of the majority but greatly reduces those of the minorities. When the minority group discriminates against the majority as occurred during apartheid in South Africa, discrimination harms the minority as well. The estimated prevalence of disability, as determined in chapter three, places people with disability in the minority group and thus in these circumstances, if there is a culture of discrimination against disability, the effect will largely fall on people with disabilities and their households. It is therefore incumbent on government and civic bodies to shift the culture of discrimination through appropriate implementation of disability rights legislation.

Access to education was discussed in chapter four where it was shown that children with disabilities are disadvantaged in both their school attendance and progression relative to their peers without disabilities. Children with severe cognitive or communication difficulties were particularly left behind while children with moderate sight or physical difficulties experienced an overall less severe impact. This variation points to the notion that some disability types are easier to accommodate compared to others. More severe disabilities may make it more difficult for a person to obtain education and/or to enter the workforce and become employed. Finding and retaining work can be affected by factors including time off work due to medical intervention and the degree of accommodation required for a specific job. In addition, people with disabilities may face difficulties outside of the work environment such as finding suitable transportation to work or have difficulties looking for work. Discrimination or prejudice in the workplace culture may also impact the opportunities for finding work.

The aforementioned difficulties are thus experienced on both the demand and supply side of the labour market. On the supply side, individuals with disabilities may choose not to supply their labour and be out of the labour force altogether due to health reasons or reasons pertaining to the potential difficulties faced in accessing places of work (Becker, 1985; Mitra, 2008; Mizunoya & Mitra, 2013a). Disability stigma and discrimination means that even when people with disabilities are willing and able to work, they may not be selected for employment based on these discriminatory (demand-side) factors (Becker, 1971). People with disabilities may not be able to work if reasonable accommodation cannot be provided by the employer.

In 2009, the International Labour Organisation (ILO) projected that South Africa loses between 6.8 and 7.2 percent of its GDP annually due to the productivity lost by excluding people with disabilities from

the workplace (Buckup, 2009; Department of Social Development, 2016). This particular calculation was based on data from the 2001 South African Census which is limited in terms of identifying people with disabilities (see chapter three) thus potentially providing a low estimate of lost productivity. The main driver of this lost productivity is attributed to inaccessibility whereby people with disabilities are unable to utilise their human capital to the maximum because they cannot access the work environment (Buckup, 2009). One of the main findings of the ILO is that the biggest losses occur in groups of people with milder disabilities. Milder disabilities have the largest potential for inclusion in the workplace because reasonable accommodation can be achieved easily (Buckup, 2009). This finding supports the approach of this thesis where a variety of disability measures are used including a moderate measure of disability. This approach will ensure that the relationship between degree of disability and the labour market is not underestimated and that a comprehensive and disaggregated overview is presented.

South Africa endorsed the UN Convention on the Rights of Persons with Disabilities in 2007 and as a result the Department of Social Development published the White Paper on the Rights of Persons with Disabilities committing to ensure that these matters highlighted in the CRPD are escalated into legislation (Department of Social Development, 2016). Article 27 of the CRPD, in particular, deals with work and employment and affirms that people with disabilities have a right to choose work freely and to work on an equal basis as others in an environment that is inclusive and accessible where reasonable accommodation is provided (United Nations, 2006). Reasonable accommodation refers to the creation of an environment that is enabling for people and that caters equally for people with disabilities in terms of accessibility and function (Department of Social Development, 2016).

In South Africa, there is no single piece of legislation that specifically targets article 27 of the CRPD but various pieces of legislation and codes therein collectively suffice in meeting article 27 (United Nations, 2006; Msipa, 2016). For example, the South African Constitution makes provision to prevent discrimination against people with disabilities in the workplace (South African Government, 1996). The Employment Equity Act (EEA) aims to promote marginalised groups including people with disabilities; however, official legislation doesn't directly address reasonable accommodation. Instead, the Minister has issued a code in addition to the EEA, the Code of Good Practice: Key Aspects of the Employment of People with Disabilities which addresses reasonable accommodation directly (Msipa, 2016). The code is not itself legally binding but does outline what is considered reasonable accommodation in the workplace and highlights the need for inclusion of people with disabilities in recruitment efforts (The Department of Labour, 2002). The concern with legislation being set up in this manner is that there are no regulations regarding the implementation of reasonable accommodation and there may be a general lack of awareness of such addendums by all employers in South Africa.

The focus of this chapter is on adults with disabilities. Previous research in South Africa has mainly focused on the employment of people with disabilities (Mitra, 2008; Mitra, Posarac & Vick, 2011; Mizunoya & Mitra, 2013b). This thesis aims to extend this work by using up to date data as well as by expanding on the analysis of the labour market by using disaggregated approaches and looking at multiple facets including participation, employment and earnings. In addition, this thesis examines the educational attainment of working age adults with disabilities because it is widely recognised in economics that education is a significant determinant of labour market outcomes (Killingsworth & Heckman, 1986; Hinchliffe, 1987). The research sub-objectives for this chapter include the following:

Sub-objectives:

i. Establish the relationship between disability and educational attainment for adults of working age in South Africa (16 to 59 years).
ii. Estimate the association between disability and labour market participation for working age adults.
iii. Determine the relationship between disability and employment for working age adults.
iv. Estimate the earnings of employed adults with disabilities compared to adults without disabilities (16 to 59 years).

This chapter is structured as follows: section 5.2 presents key information about the data as well as the descriptive statistics for the chapter. Section 5.3 presents the multivariate analysis for educational attainment and 5.4 presents the multivariate analysis for the labour market outcomes in three parts. Section 5.4.1 addresses the relationship between disability and labour market participation, 5.4.2 examines disability and employment and finally section 5.4.3 presents the findings for the relationship between disability and earnings. Section 5.5 concludes this chapter which serves as the final analysis chapter of this thesis.

5.2 Data and Descriptive Statistics

The data used in this chapter is the same as that used in the previous chapter (chapter four), namely a seven-year pooled sample of the South African General Household Survey (2011 to 2017). Given the fairly low prevalence of disability relative to the full population, the pooled sample allows for an increased number of observations thereby expanding the explanatory power of this analysis. The analysis in this chapter is conducted for adults of working age which includes all individuals aged 16 to 59 years.

This section presents an overview of sample statistics on disability, adult educational attainment and

labour market outcomes. Whilst the GHS includes an extensive section on education and is therefore an excellent source of information in this regard, it is not necessarily the best resource for an analysis of the labour market (Yu, 2012). It is not specifically designed as a labour market survey although it does contain sufficient questions which allow for the classification of labour market outcomes such as participation, employment and earnings for people with and without disabilities. However, there are no questions on hours worked or the specific occupation that someone has once employed, therefore only whether the employment sector is formal or informal can be used as an indication of job type. Whilst these limitations prevent the extensive labour market analysis that would be preferred, this particular household survey is considered to be superior in terms of reliable earnings data compared to the QLFS (Kerr, 2021). The GHS is currently the only national survey that incorporates the internationally comparable WG-SS, collects extensive data on school attendance and educational outcomes as well as labour market outcomes. It is therefore currently the best data source that South Africa has with which to analyse the participation of people with disabilities in both education and the labour market.

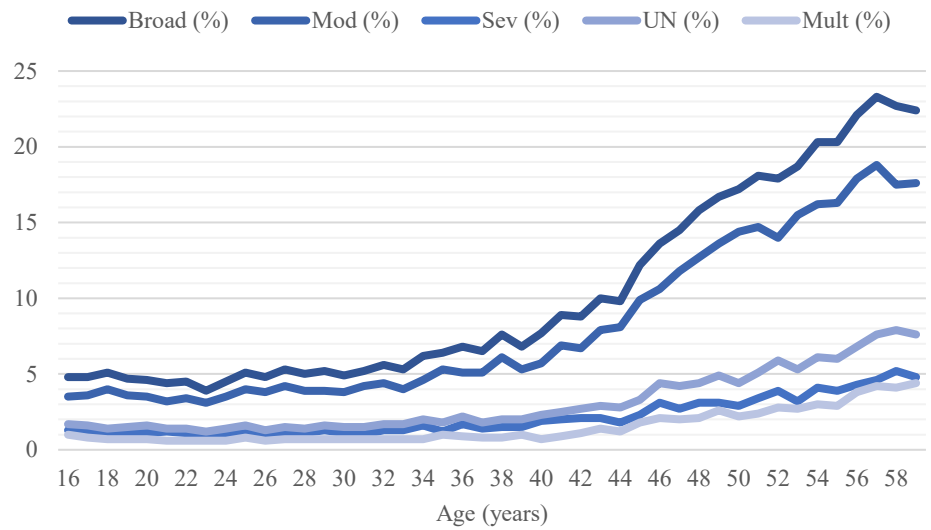
The measures of disability used in this chapter are the same as those described in chapter three and applied in chapter four: broad, moderate, severe, UN and multiple. These are once again based on the WG-SS which is best suited to a study on adults. It is nonetheless considered to be limited in that it does not collect information on mental health conditions and upper body physical disabilities. The six domains of functioning cover sight, hearing, physical, self-care, communication and cognition (remembering or concentrating) difficulties.

Chapter three presented prevalence estimates for adults with disabilities and found that the prevalence of disability based on the broad measure is eight percent, the prevalence is seven percent for moderate disabilities, two and a half percent for the UN measure, just under two percent for the severe measure and one percent for multiple disabilities. On the whole, moderate difficulties seeing and moderate difficulties with self-care are the most common disability types.

It is suggested in the literature that every person in their lifetime will experience some form of disability because disability is part of the human condition and is an expectation of the ageing process (World Health Organisation, 2021). To that end, Figure 5.1 below illustrates the percentage of adults with disabilities in each age from age 16 to age 59. Each of the measures of disability indicate that the percentage of adults in each age that have disability increases from age 16 to age 59. The percentage of people with disabilities is largest between age 56 and 58 years. This finding is corroborated by Table 5.1 which presents the mean age for each of the disability measures as well as for the full sample. The average age of the full sample of working age adults is 34 years of age whereas the average age of people with disabilities across all measures is around six to seven years older. People with multiple

disabilities tend to be the oldest of all the measures of disability at close to 42 years on average. For each measure of disability, the mean age of individuals with that disability is significantly larger than for people without disabilities.

Figure 5.1: The percentage of adults with disabilities in each age (16 to 59 years)



Source: Own Calculations, Pooled GHS 2011-2017.

The first key objective of this chapter is to establish the relationship between disability and educational attainment. Educational attainment is derived from a question in the GHS that asks respondents for the highest level of education they have completed at the time of survey, which can be converted into an equivalent number of years of completed education. The highest level of education, as determined by the available responses, is a masters or doctoral degree. Despite these being separate degrees, they are combined in this response option and it is therefore not possible to disentangle the two. The maximum years of education is therefore set at 17 years.

The descriptive statistics in Table 5.1 present educational attainment as both total number of years of education attained as well as categories of education represented by dummy variables (no schooling, primary schooling, some secondary education, completed secondary (matric) and tertiary). On average, the full sample of working age (all) have ten years of schooling whereas people with disabilities, irrespective of measure, have fewer years of education on average. All of the measures of disability are significantly different compared to people without disabilities. People with severe disabilities and multiple disabilities have three years less education compared to the full sample of adults. Based on each education category, people with severe, UN or multiple disabilities are overrepresented in the group of people who have no schooling at all and underrepresented amongst those with matric or tertiary

education. All of the education categories are significant at the one percent level for people with disabilities compared to people without disabilities. The results of these educational descriptive statistics highlight that people with disabilities have lower levels of education. However, educational attainment has risen over time in South Africa and individuals with disability are older than those without disability. Thus, it is necessary to conduct multivariate analysis to establish whether there is a direct relationship between disability and educational attainment whilst holding all other relevant explanatory variables constant. This particular analysis will be presented in section 5.3.

Table 5.1: The mean characteristics of adults (16 to 59 years) in South Africa, by disability measure

	All	Broad	Moderate	Severe	UN	Multiple
Age	33.581	40.605***	40.700***	40.236***	40.909***	41.458***
	(0.034)	(0.106)	(0.120)	(0.206)	(0.180)	(0.281)
Education:						
Number of years of schooling	10.174	9.168***	9.634***	7.370***	7.514***	6.880***
	(0.016)	(0.047)	(0.046)	(0.090)	(0.075)	(0.104)
No school	0.028	0.077***	0.051***	0.176***	0.157***	0.200***
	(0.001)	(0.002)	(0.002)	(0.007)	(0.006)	(0.009)
Primary	0.129	0.209***	0.194***	0.269***	0.278***	0.292***
	(0.001)	(0.004)	(0.004)	(0.007)	(0.006)	(0.009)
Incomplete secondary	0.434	0.359***	0.366***	0.332***	0.339***	0.315***
	(0.002)	(0.004)	(0.005)	(0.008)	(0.007)	(0.009)
Matric	0.284	0.210***	0.227***	0.147***	0.145***	0.122***
	(0.002)	(0.004)	(0.004)	(0.006)	(0.005)	(0.007)
Tertiary	0.125	0.145***	0.162***	0.077***	0.080***	0.070***
	(0.002)	(0.004)	(0.005)	(0.005)	(0.004)	(0.005)
Demographic:						
Male	0.492	0.435***	0.418***	0.501	0.479*	0.466***
	(0.001)	(0.004)	(0.004)	(0.008)	(0.007)	(0.009)
Female	0.508	0.565***	0.582***	0.499	0.521*	0.534***
	(0.001)	(0.004)	(0.004)	(0.008)	(0.007)	(0.009)
African	0.797	0.780***	0.775***	0.798	0.812**	0.829***
	(0.003)	(0.006)	(0.007)	(0.009)	(0.008)	(0.010)
Coloured	0.092	0.083***	0.075***	0.114***	0.098	0.085
	(0.002)	(0.003)	(0.003)	(0.007)	(0.005)	(0.007)
Indian	0.027	0.023***	0.024	0.018**	0.018***	0.016***
	(0.001)	(0.002)	(0.002)	(0.004)	(0.003)	(0.003)
White	0.084	0.114***	0.125***	0.070**	0.071***	0.070**
	(0.002)	(0.005)	(0.006)	(0.006)	(0.005)	(0.007)
Never married	0.551	0.415***	0.383***	0.539	0.498***	0.493***
	(0.002)	(0.004)	(0.005)	(0.009)	(0.007)	(0.011)
Married or living together	0.388	0.459***	0.488***	0.345***	0.372**	0.366**
	(0.002)	(0.005)	(0.005)	(0.008)	(0.007)	(0.010)
Divorced or widowed	0.061	0.127***	0.129***	0.117***	0.130***	0.141***
	(0.001)	(0.003)	(0.003)	(0.005)	(0.004)	(0.006)
Location:						
Urban	0.672	0.691***	0.712***	0.612***	0.618***	0.611**
	(0.003)	(0.006)	(0.006)	(0.010)	(0.009)	(0.013)
Rural	0.328	0.309***	0.288***	0.388***	0.382***	0.389***
	(0.003)	(0.006)	(0.006)	(0.010)	(0.009)	(0.013)
Province:						
Western Cape	0.118	0.098***	0.086***	0.145***	0.122	0.090***
	(0.002)	(0.004)	(0.004)	(0.008)	(0.006)	(0.007)
Eastern Cape	0.113	0.119	0.112	0.145***	0.138***	0.140***
	(0.002)	(0.004)	(0.004)	(0.007)	(0.006)	(0.009)
Northern Cape	0.021	0.030***	0.030***	0.030***	0.030***	0.030***
	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)

Free State	0.052	0.083***	0.086***	0.069***	0.084***	0.095***
	(0.001)	(0.003)	(0.004)	(0.004)	(0.005)	(0.007)
KwaZulu-Natal	0.188	0.145***	0.139***	0.171**	0.177	0.200
	(0.003)	(0.005)	(0.005)	(0.008)	(0.008)	(0.012)
North West	0.067	0.089***	0.086***	0.104***	0.108***	0.110***
	(0.002)	(0.004)	(0.004)	(0.006)	(0.006)	(0.008)
Mpumalanga	0.077	0.083**	0.080	0.096***	0.091***	0.081
	(0.002)	(0.004)	(0.004)	(0.006)	(0.005)	(0.006)
Gauteng	0.264	0.286***	0.315***	0.175***	0.187***	0.191***
	(0.004)	(0.007)	(0.008)	(0.008)	(0.008)	(0.012)
Limpopo	0.098	0.067***	0.068***	0.065***	0.063***	0.062***
	(0.002)	(0.003)	(0.003)	(0.005)	(0.004)	(0.005)
Household Characteristics:						
Household earned income	8.637	9.421***	10.464***	5.393***	5.673***	5.342***
	(0.114)	(0.314)	(0.378)	(0.261)	(0.224)	(0.305)
Household other income	9.829	11.695*	10.949	14.578*	15.892**	23.019***
	(0.600)	(1.065)	(1.063)	(2.833)	(2.415)	(4.799)
Household grant income	0.774	0.883***	0.696***	1.607***	1.410***	1.428***
	(0.009)	(0.018)	(0.013)	(0.056)	(0.042)	(0.045)
Number of children 15 and under	0.913	0.813***	0.783***	0.930	0.884	0.842**
	(0.008)	(0.012)	(0.013)	(0.025)	(0.022)	(0.030)
Number of working age adults (16 to 59 years)	3.152	2.967***	2.902***	3.215	3.160	3.188
	(0.015)	(0.019)	(0.020)	(0.043)	(0.038)	(0.057)
Number of older adults (60 years +)	0.240	0.206***	0.176***	0.325***	0.282***	0.280***
	(0.003)	(0.006)	(0.005)	(0.019)	(0.014)	(0.016)
Sample	338312	30035	23523	6512	9608	4595
Population	226310105	18217894	14469292	3748602	5498428	2609422

Source: Own Calculations, Pooled GHS 2011-2017.

Note: Standard errors in parenthesis. The significance levels highlight the difference between people with disabilities compared to people without disabilities (as defined for each measure): *** significant at the 1% level, ** significant at the 5% level and * significant at the 10% level. Earnings/income values are measured in thousands of Rands per month and are inflation adjusted

The other characteristics explored in Table 5.1 include individual-level demographic characteristics such as gender and race. There is a relatively even distribution of men and women in the full sample of adults of working age. However, for people with disabilities as measured by all of the disability measures except for severe disabilities, the proportion of women is slightly higher than the proportion of men. All of these, except for severe disabilities are significant at the one percent level compared to people without disabilities. In terms of race, Africans are significantly overrepresented in the group of people with UN or multiple disabilities whilst whites are significantly overrepresented in the group of people with broad or moderate disabilities. The proportion of people with disabilities (severe, UN, multiple) who are married or living with a partner is less than that for the total sample of adults as well as for those with broad or moderate disabilities. And the opposite is true for those who are divorced or widowed or never married whereby there is a relatively larger portion of people with disabilities compared to the full sample. In terms of location, people with disabilities as measured by the severe, UN and multiple measure are overrepresented in rural areas, this is significant at the one percent level with respect to people without disabilities.

In terms of household-level characteristics, there are a few significant indicators such as household earned income and grant income. Once again, the groups of people with disability that are most notably negatively affected are people with disabilities measured by the severe, UN or multiple measures. Household income for these groups of individuals is on average R3000 less per month compared to the full sample of working age adults. People with disabilities as captured by the broad and moderate measure of disabilities live in households with earned income that is significantly higher than the average of the full sample of adults. This indicates that people with milder disabilities live in wealthier households whereas people with more severe disabilities live in poorer households. Grant income for people with severe, UN or multiple disabilities is significantly higher per month on average compared to the full sample as well as those with broad or moderate disabilities. In terms of household size, there are significantly more children under 15 years and adults of working age living in households where people with broad or moderate disabilities live compared to people without disabilities. There are significantly more adults 60 years and older in households where people with severe, UN or multiple disabilities live compared to people without disabilities.

The final table of descriptive statistics, Table 5.2, presents the mean labour market outcomes for adults of working age. The second key objective of this chapter is to establish the relationship between disability and labour market participation. Table 5.2 presents both the strict and expanded definitions of labour market participation. Participation includes all employed and unemployed individuals but differs depending on the definition of unemployment. The expanded definition of unemployment includes all individuals who are willing and able to work but not actively searching for work whereas the official definition only includes people who are actively seeking a job. Both the expanded and official definitions of unemployment are used by StatsSA but in recent years, the official definition has become the 'official definition of unemployment' (Statistics South Africa (Statssa), 2012). Both definitions are typically used due to the concern over discouraged workers and the barriers to job seeking behaviour.

The data shows that 62 percent of all adults of working age are considered labour market participants based on the official definition and 69 percent based on the expanded definition of participation. The mean participation rate for people with disabilities as measured by the moderate measure is very similar to these at 61 and 66 percent respectively. The participation rates for people with broadly defined disabilities is slightly lower at 55 and 60 percent. The official labour market participation rate for people with disabilities as measured by the severe, UN and multiple measures is 33, 37 and 35 percent respectively. This is just over half of the official participation rate for the full sample of adults of working age. For the expanded definition of labour market participation, these figures are 39, 44 and 41 percent respectively. Relative to the full sample of working age adults, the participation rates for

people with UN and multiple measures of disability are close to two-thirds lower and the severe measure is just over half. As mentioned, the expanded definition of participation includes people who may want to work but be unable to search for work. People with disabilities may struggle to search for work due to constraints such as transportation and reasonable accommodation. Once again, this relationship will be further explored in the multivariate analysis that follows in section 5.3.

Establishing the relationship between disability, employment and earnings is the third and fourth key objective of this chapter respectively and these descriptive statistics are a starting point for this analysis. The employment rate for all adults based on the official definition of labour market participation is 77 percent and for each measure of disability the employment rate is higher. There is a significantly greater proportion of people with disabilities who are employed (official definition) compared to people without disabilities. This means that if adults with disabilities are willing and able to work and actively seeking work there is a relatively higher rate of employment overall. The problem is such that people with disabilities are overrepresented among those who do not participate or who are out of the labour market. The employment rate for all adults based on the expanded definition of labour market participation is 70 percent; however, in this case, the employment rate for people with severe, UN or multiple disabilities is slightly lower at 68 percent. This implies that people with more severe forms of disability have higher rates of unemployment at 32 percent. It must be noted that these figures are univariate results and show the proportion of each group who are participating or who are employed. It does not present the relationship between disability and participation or employment as the multivariate analysis that follows will do.

Table 5.2: Mean labour market outcomes for adults of working age

	All	Broad	Moderate	Severe	UN	Multiple
Labour market participation (LMP):						
Official	0.618	0.553***	0.611*	0.331***	0.371***	0.347***
	(0.002)	(0.004)	(0.005)	(0.008)	(0.007)	(0.010)
Expanded	0.685	0.607***	0.664***	0.385***	0.436***	0.414***
	(0.002)	(0.004)	(0.004)	(0.008)	(0.007)	(0.011)
Employment						
% of official LMP	76.9	83.1***	83.7***	79.0*	80.0***	81.2***
	(0.2)	(0.4)	(0.4)	(1.1)	(0.9)	(1.2)
% of expanded LMP	69.5	75.7***	76.9***	67.7	68.1	67.9
	(0.2)	(0.5)	(0.5)	(1.2)	(1.0)	(1.5)
Formal Sector Employment	78.8	76.7***	77.3***	71.7***	69.3***	65.5***
	(0.2)	(0.6)	(0.6)	(1.3)	(1.2)	(1.8)
Monthly Earnings from Employment	8495.65	10139.46***	10387.36***	8321.25	8006.13	7313.96**
	(90.78)	(328.25)	(361.85)	(459.21)	(360.67)	(514.68)

Source: Own Calculations, Pooled GHS 2011-2017.

Note: Standard errors are in parenthesis. The significance levels highlight the difference between people with disabilities compared to people without disabilities (as defined for each measure): *** significant at the 1% level, ** significant at the 5%

level and * significant at the 10% level. Earnings/income values are measured in thousands of Rands per month and are inflation adjusted with 2017 as the base year.

The GHS does not offer detail on the type of job someone has but does distinguish between formal and informal sector employment. In this context, formal sector employment refers to businesses that are registered to perform their activity, whereas informal sector refers to unregistered businesses (Statistics South Africa, 2011). For all employed adults, 80 percent are employed in the formal sector. For people with disabilities, specifically those with severe, UN or multiple disabilities, the proportion of people working in the formal sector is less than the sample of all adults. Out of all people with multiple disabilities, 66 percent work in the formal sector. This is the lowest proportion of adults employed in the formal sector out of all of the different measures of disability. The lower proportion of people with disabilities (across all measures) employed in the formal sector is significantly different from people without disabilities.

The average monthly earnings from employment for all adults in the sample of working age individuals is R8495.65. People with disabilities as measured by the broad or moderate measure of disability earn more on average compared to all adults. People with broad or moderate disabilities earn an average over ten thousand rand per month, this is significant at the one percent level compared to people without disabilities. The average monthly earnings for people with severe or UN disabilities are lower than the average for the sample but are not significant. People with multiple disabilities earn on average R7313.96 per month which is the lowest monthly earnings of all the disability types and is significant compared to people without disabilities.

The mean values presented in Table 5.2 indicate that people with disabilities, specifically the severe, UN and multiple measures of disability are underrepresented in formal sector work and earn less on average compared to the total sample of working age adults. The results suggest that people with disabilities are often not able to participate in the labour market at all and are thus not considered for employment. Employment rates, especially those based on the official definition of labour market participation are similar, if not higher than the average for the full sample of adults. Interestingly, people with disabilities as measured by the broad or moderate measure are overrepresented in employment (both official and expanded) and earn more on average compared to the full sample of adults. This could possibly be explained by disabilities being acquired later in life as part of the normal ageing process and thus individuals could have well-established jobs prior to acquiring the disability. People with more challenging forms of disability, as captured by the severe, UN and multiple measures of disability are much less likely to participate in the labour market in the first place but if they do they have slightly lower employment rates and lower earned income compared to all adults of working age. They are much less likely to participate in the labour market in the first place. The relationship between disability,

labour market participation, employment and earnings will be further explored in the multivariate analysis that follows in section 5.4.

The descriptive statistics in section 5.2 above are informative and interesting but they represent a univariate analysis and cannot say anything about the direct relationship between disability, education and labour market outcomes. The following section is split into four different sets of multivariate analysis: the first investigates the relationship between disability and educational attainment through the use of an OLS model, the second examines labour market participation using a probit estimation, the third uses a probit model to estimate the relationship between disability and employment and finally the fourth establishes the relationship between disability and earnings using both an OLS model and an Oaxaca-Blinder decomposition analysis. In each case, the models are designed to establish the relationship between disability and the indicator of interest such that all other explanatory variables are held constant.

5.3 Educational Attainment

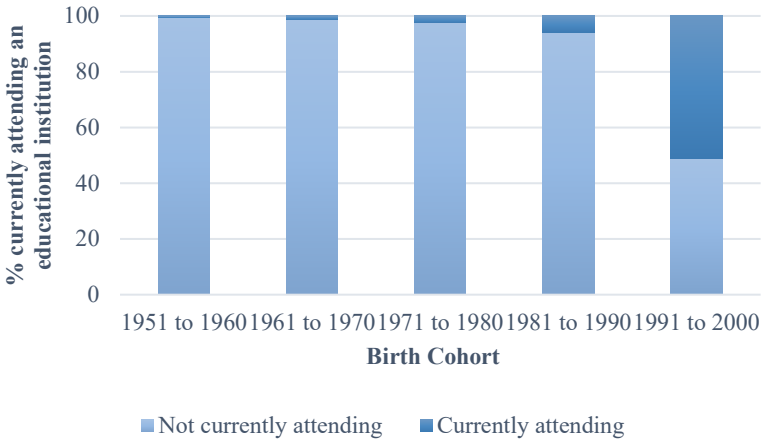
In chapter four, an extensive analysis of children with disabilities was conducted around their experience with education. The analysis covered issues of access to schooling (attendance) and progression in school relative to their peers without disabilities. The results were very clear that children with disabilities are less likely to attend school and that if they are able to access schooling, they tend to be behind their peers without disabilities in terms of progression. Disabilities can be acquired in childhood or adulthood. If acquired in childhood the knock-on effects of limited or delayed educational attainment can have a serious impact on labour market opportunities in adulthood (Stabile & Allin, 2012). If acquired later in life, post schooling, this may impact on the ability to obtain a job or retain existing employment until normal retirement age. Cross-country comparison studies have shown that the association between poverty and disability appears to be largely due to lower levels of educational attainment for adults with disabilities (Filmer 2008, SADPD 2012). Also, there is a strong possibility that people who are unable to access education may fall into poverty, and poverty makes people more vulnerable to acquiring disabilities (Braathen & Loeb, 2011; Groce et al., 2011; Loeb et al., 2011; Wazakili et al., 2011). This section therefore aims to compare the educational attainment of adults with and without disabilities using a multivariate approach to isolate the role of disability from some of the confounding factors.

There are two main limitations to investigating the relationship between disability and education for adults, compared to the type of estimation done in chapter four for children. First, when using cross-sectional data, it is not possible to identify the age of onset of disability for any individual. As outlined previously, disabilities can be associated with the normal ageing process or be acquired through

accident or disease and thus someone may have become disabled later in life, without that disability having affected their educational attainment during childhood. Second, older people may have had less opportunity to acquire education in their younger years due to the political climate and/or other cultural reasons of the time compared to younger individuals. Both of these issues mean that comparing the educational attainment of younger adults to older adults is problematic.

This thesis addresses this limitation by comparing educational attainment within a cohort of adults of similar age. Five birth cohorts were created for the purposes of this analysis; cohort one included individuals born between 1951 and 1960 inclusive, cohort two includes those born between 1961 and 1970 inclusive, cohort three: 1971 and 1980, cohort four: 1981 and 1990 and lastly cohort five includes those born between 1991 and 200 inclusive. Given that the data are from a pooled sample of 7 years of the GHS (2011 to 2017), the youngest cohort (born between 1991 and 2000) consists of people between the ages of 16 and 26 years old at the time of the survey, while the oldest cohort consists of those aged 51 to 59. The analysis sample is restricted to those aged 16 to 59 at the time of the survey. The results pertaining to the youngest cohort must be treated with some caution, as their educational attainment may be incomplete. Figure 5.2 below presents the educational attendance status for adults. It must be noted that for birth cohort five (those born 1991 to 2000) half of the cohort is currently attending an educational institution and thus have not completed their educational attainment, whereas the older cohorts have largely completed their education.

Figure 5.2: Adults educational attendance status, by birth cohort



Source: Own Calculations, Pooled GHS 2011-2017.

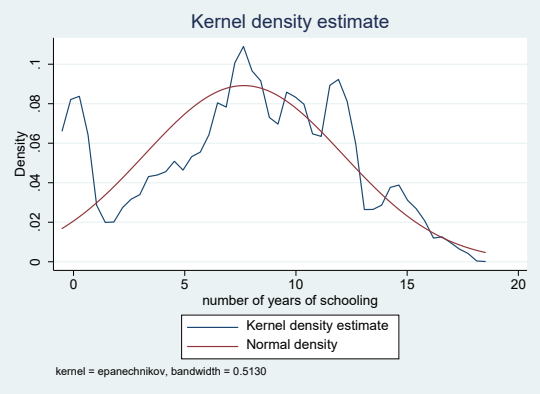
The figure below presents kernel density plots for the distribution of educational attainment for each birth cohort. The plots appear somewhat irregular with many peaks and troughs because educational attainment is recorded as whole numbers only. Figures 5.3a represents the oldest cohort in this analysis

(those born between 1951 and 1960 inclusive), and is skewed to the right where the majority of people have zero years of education. In figure 5.3b (those born between 1961 and 1970 inclusive) there is a distinct peak at zero years of education; however, this is smaller relative to the previous birth cohort. In this plot, educational attainment appears to peak at 12 years of education (representing completed grade 12 or matric). However, for people born in 1971 and later (figure 5.3c, d and e), educational attainment more closely resembles a normal distribution with the peak occurring around 10 to 12 years of age.

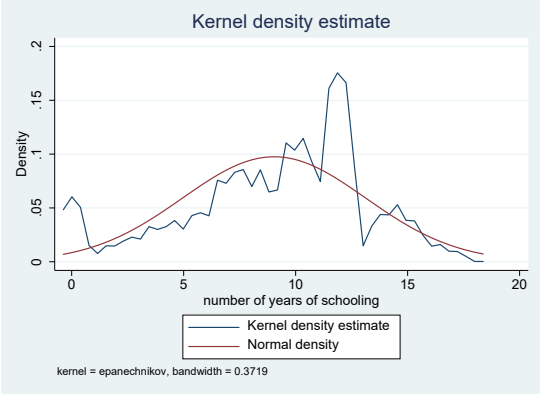
The differences observed may be a result of legislation pertaining to education in South Africa. Prior to 1994, education was only compulsory for the White and to a lesser extent, the Indian and Coloured population groups whilst African learners were segregated through the Bantu Education Act 1953 (de Wet & Wolhuter, 2009). The Bantu Education Act was repealed in 1980 but it was only in 1996 that the South African Schools Act was enacted making access to education more equitable. The South African Schools Act stipulated that the compulsory school age for all learners is ages 7 to 15 years (Department of Education, 1998). In terms of disability legislation, prior to 1994 people with disabilities were largely marginalised and the only interventions were in the form of welfare grants, medical care and limited assistive devices but this was largely in benefit of the White population at the time. The Constitution of the Republic of South Africa (1996) was the first formalised legislation that promoted the protection the rights of people with disabilities (South African Government, 1996).

Figure 5.3: Educational attainment for adults of working age by birth cohort

a. Born 1951 to 1960

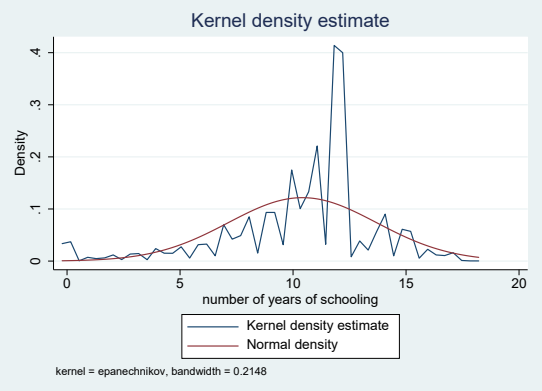


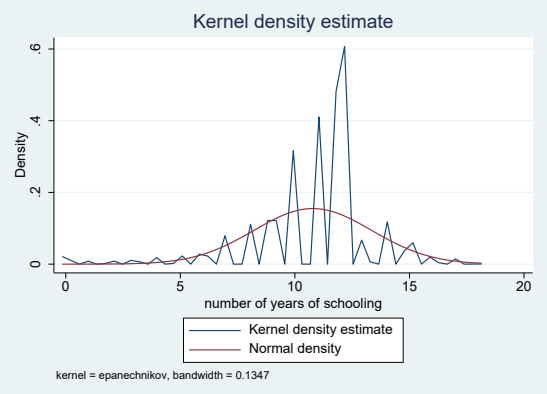
B. Born 1961 to 1970



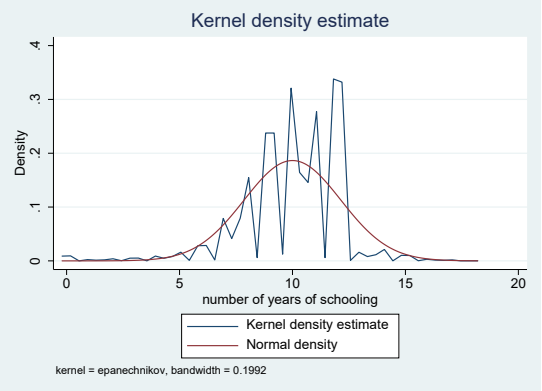
c. Born 1971 to 1980

d. Born 1981 to 1990





e. Born 1991 to 2000



Source: Own calculations, GHS Pooled Sample 2011 – 2017.

It is evident from the birth cohort plots that factors such as education policy have had an impact on the manner in which education has been attained over time, in addition to the roles likely played by social norms and economic pressures. This provides motivation to disaggregate the analysis of the association between disability and educational attainment by birth cohort.

Relatively few studies have analysed educational attainment as a dependent variable, and those that have done so typically use OLS models as they assume that educational attainment is a continuous variable (Psacharopoulos & Yang, 1991; Nixon & Robinson, 1999; Kingdon, 2002; Chiswick & DebBurman, 2004). In the analysis that follows, an OLS model will therefore be used with years of education being treated as a continuous variable that ranges from 0 to 17 years. The OLS equation for educational attainment is:

$$YE = \alpha' D + \delta' Z + \gamma' H + \varepsilon \quad (5.1)$$

Where YE refers to years of education, a continuous variable representing the maximum years of

education that someone has attained at the time of survey. D represents the disability measures, Z the individual characteristics, H the household characteristics and $\boldsymbol{\varepsilon}$ the random error term. The individual characteristics include age, race and gender and the household characteristics include location, province and year of survey. The set of covariates used here is more limited than the set used in the labour market analysis that follows. This is due to time lag between when education was acquired and when the date were collected. This model is estimated six times, with the first model including the full sample of working age adults while the remaining five are estimated for each birth cohort. These six models are estimated separately for each measure of disability. Thus, the D term changes in each model depending on the measure of disability being used (broad, moderate, severe, UN and multiple). An additional model is estimated containing each disability type (both moderate and severe) in a single model. Given that the results are based on 36 model estimations, for simplicity, Table 5.3 below presents the results for the disability indicators only while the full set of results including all the individual and household level characteristics is included in Appendix C, Tables C1 to C6. Notably, all models include a quadratic in age, and therefore the results indicate how educational attainment differs by disability status when comparing two adults of the same age, given that disability prevalence increases with age.

The full sample of working age adults (age 16 to 59) is presented in column one and each of the birth cohorts in columns two to six. The composite measures of disability appear in the first half of the table, starting with the broad measure of disability. People with disabilities (broad measure) have just over half a year of schooling less than people without disabilities. For the broad measure, the coefficients are negative and significant across all of the birth cohorts indicating that disability and educational attainment are negatively associated. The older cohorts (people born 1951 to 1960) have a third of a year of schooling less than people without disabilities whereas people born 1981 to 1990 have over two-thirds less schooling. For the moderate measure of disabilities, the coefficients are negative, small and insignificant and only the coefficients on the full sample and the youngest cohort are significant (the first and last columns).

Table 5.3: An OLS estimation of the association between disability and educational attainment for adults of working age, by birth cohort

		Birth Cohorts				
	All Adults (Working Age)	**1 1951 to 1960**	**2 1961 to 1970**	**3 1971 to 1980**	**4 1981 to 1990**	**5 1991 to 2000**
Composite Measures:						
Broad	-0.598***	-0.327***	-0.391***	-0.584***	-0.674***	-0.781***
	(0.037)	(0.063)	(0.060)	(0.073)	(0.074)	(0.070)
Moderate	-0.142***	-0.110	-0.077	-0.097	-0.021	-0.204***
	(0.036)	(0.067)	(0.062)	(0.072)	(0.062)	(0.053)
Severe	-2.110***	-0.871***	-1.460***	-2.200***	-2.947***	-2.829***
	(0.083)	(0.110)	(0.129)	(0.180)	(0.202)	(0.206)

UN	-1.928***	-0.957***	-1.381***	-2.004***	-2.677***	-2.406***
	(0.068)	(0.090)	(0.104)	(0.147)	(0.169)	(0.167)
Multiple	-2.420***	-1.114***	-1.602***	-2.587***	-3.692***	-3.456***
	(0.098)	(0.118)	(0.141)	(0.215)	(0.260)	(0.272)
Disability Type:						
Seeing						
moderate	0.410***	0.332***	0.358***	0.537***	0.698***	0.336***
	(0.038)	(0.074)	(0.068)	(0.078)	(0.062)	(0.051)
severe	0.048	-0.166	-0.049	0.133	0.633***	0.007
	(0.098)	(0.158)	(0.178)	(0.229)	(0.210)	(0.164)
Hearing						
moderate	-0.538***	-0.488***	-0.830***	-0.683***	-0.471***	-0.121
	(0.077)	(0.138)	(0.156)	(0.180)	(0.152)	(0.120)
severe	-1.432***	-1.011***	-1.199***	-1.664***	-1.600***	-1.186***
	(0.188)	(0.311)	(0.367)	(0.447)	(0.325)	(0.351)
Mobility						
moderate	-0.892***	-0.880***	-1.060***	-0.754***	-0.420*	0.017
	(0.093)	(0.119)	(0.147)	(0.233)	(0.241)	(0.325)
severe	-1.165***	-0.460**	-1.179***	-0.899***	-1.342***	-2.139***
	(0.131)	(0.180)	(0.232)	(0.297)	(0.333)	(0.419)
Communication						
moderate	0.277	0.352	0.552	0.218	0.044	-0.022
	(0.268)	(0.473)	(0.486)	(0.548)	(0.532)	(0.511)
severe	-2.208***	0.455	-1.860***	-2.520***	-1.865***	-2.465***
	(0.282)	(0.749)	(0.573)	(0.708)	(0.488)	(0.511)
Cognitive						
moderate	-1.628***	-1.224***	-1.378***	-1.627***	-2.011***	-1.447***
	(0.092)	(0.172)	(0.165)	(0.195)	(0.197)	(0.160)
severe	-3.420***	-1.398***	-2.464***	-3.879***	-4.231***	-3.590***
	(0.163)	(0.270)	(0.271)	(0.355)	(0.354)	(0.337)
Self-Care						
moderate	-0.061	0.051	-0.024	-0.235	-0.382	-0.698
	(0.234)	(0.389)	(0.416)	(0.455)	(0.530)	(0.510)
severe	-1.241***	-0.397	-0.487	-0.800	-2.575***	-1.683***
	(0.236)	(0.408)	(0.408)	(0.522)	(0.473)	(0.552)

Source: Own Calculations, Pooled GHS 2011-2017.

Note: Standard errors in parenthesis. *** significant at the 1% level, ** significant at the 5% level and * significant at the 10% level.

In column one, people with severe disabilities have on average two years less education compared to people without severe disabilities. The difference in educational attainment is smaller (around one year less education) between people with and without disabilities for the older cohorts (1951 to 1960 and 1961 to 1970); however, the gap increases in the younger cohorts. People born between 1971 and 1980 have two fewer years of education and people born between 1981 and 1990 and 1991 to 2000 have close to three fewer years of education compared to people without disabilities. The results are similar for the UN measure of disability and the largest difference in years of schooling is found for people with multiple disabilities. Once again, cohorts three, four and five represent the largest difference in educational attainment for people with multiple disabilities compared to people without. In this case, people with disabilities have between three and four fewer years of education in comparison. All of the

coefficients with the exception of moderate disabilities are highly significant.

The second half of Table 5.3 presents the results of the model that includes each disability type as determined by the six domains of functioning (seeing, hearing, mobility, communication, cognitive and self-care). For each disability type, a moderate and severe measure is presented. All of the coefficients representing the relationship between moderate sight disabilities and educational attainment are significant but positive. This is contrary to the findings of the composite measures of disabilities discussed previously which showed a negative association between educational attainment and disability. However, it does indicate that people with moderate difficulties seeing may have acquired these disabilities later in life or are accommodated better in the educational sector, thus not impacting their educational attainment at the time. The coefficients under each birth cohort for severe difficulties seeing, moderate communication and moderate self-care difficulties are all insignificant with respect to educational attainment.

Hearing disabilities, both moderate and severe, have a negative association with educational attainment and this is the case for each birth cohort as well as for the full sample of working age adults. Adults with severe difficulties hearing have just under one and a half fewer years of education compared to adults without. The difference in educational attainment for people with severe difficulties hearing compared to people without is largest for those born between 1971 and 1980. In this case people with severe difficulties hearing have close to two fewer years of education.

For all disability types, as expected, the largest negative association is between educational attainment and severe disabilities. For adults of working age, people with severe mobility and severe self-care disabilities have one year less education compared to people without disabilities and people with severe communication difficulties have two years less education. In each case, there is once again a difference in the results for each birth cohort with the younger birth cohorts having the largest negative association between disability and educational attainment. For people with severe mobility disabilities, the largest difference is seen in birth cohort five (1.3 years less education), for severe communication difficulties it is in birth cohort three (2.5 years less) and for severe self-care difficulties it is in birth cohort four (2.6 years less).

People with severe cognitive difficulties have just over three fewer years of education compared to people without disabilities based on the full sample of working age adults. The birth cohort results vary with the smallest difference between people with and without disabilities in the older cohorts. People with disabilities born in birth cohort one and two have between one and two years less education compared to people without disabilities whereas people in the younger cohorts (three, four and five)

have around four years less education compared to people without disabilities.

For all disability types except difficulties seeing, there is a significant negative relationship between disability and educational attainment for adults of working age. In all cases, the older cohorts (one and two) which include people born in the 1950s and 1960s, the difference in educational attainment for people with and without disabilities is smaller. This could be due to two main reasons: disabilities were acquired later in life and therefore didn't affect their educational attainment at the time or the education legislation in the country was very poor at the time and favoured White people over all other race groups and thus people in general may have attained fewer years of education as a result of this. The largest difference between people with and without disabilities is seen in the younger cohorts (three, four and five) which includes people born in the 70s, 80s and 90s.

However, in most cases the largest difference is found for people born between 1981 and 1990. Schooling for these individuals would therefore have taken place in the late 80s or early 90s which was around the same time that the abolition of apartheid started and South Africa began moving towards democracy in 1994. Compulsory school age legislation was implemented in 1996 and so this would to some extent have affected people in these age cohorts but largely would affect the people in birth cohort five. It is a concern that in light of these changes, people with disabilities have larger differences in educational attainment compared to people without disabilities. This is despite move towards more favourable educational policies in the sense of more equitable policies for race and gender and the protection of disability rights indicated in the Constitution of South Africa. Despite the acknowledged limitations of analysing educational attainment for adults, these findings confirm those in chapter four that educational attainment is negatively associated with disability and this chapter indicates that this negative association has persisted across birth cohorts.

5.4 Labour market outcomes

The remaining objectives of this chapter is to determine the effect of disability on an individual's labour market participation, employment and earnings. International literature suggests that people with disabilities face inequalities in the labour market despite policies that advocate for the opposite (Kidd, Sloane & Ferko, 2000; Gannon & Nolan, 2004; Altman, 2005; Drydakis et al., 2010; Mizunoya & Mitra, 2013b). The barriers faced by people with disabilities in the labour market are heterogeneous and country-specific. Identifying people with disabilities in each country and making cross-country comparisons is difficult largely due to the different methods of measuring disability in each survey (Mizunoya & Mitra, 2013b). This is one of the main motivations for this study, to identify people with disabilities and provide tangible statistics for South Africans using the internationally comparable Washington Group short set of questions.

Prior studies focusing on people with disabilities and the South African labour market have been limited in terms of the data and measures of disability used. One such study was an analysis of labour market participation as a result of disability screening measures for the disability grant in South Africa. This study used the Labour Force Survey of 2000 and did not use a measure of disability in the analysis (Mitra, 2009). Another study indicates that labour market participation and employment of people with disabilities has declined over time (Mitra, 2008). The data used was the October Household Survey (OHS) 1998 and 1999 and the GHS 2002 to 2006 (Mitra, 2008). The main limitations of this study were that the disability questions were limited mainly to a binary indicator of disability (the basic measure as discussed in chapter three). The findings whilst pertinent at the time, need to be updated through more recent data and measures of disability.

Using the first two waves of NIDS, a study found that people with disabilities are less active in the labour market and less likely to find employment (Graham, 2020). The study used logistic regression to estimate employment status (Graham, 2020). However, whilst the NIDS can be used for an analysis of adults with disabilities, it is not a standardised approach to measuring disability and also makes use of problematic language in the survey which is based on the medical model of conceptualising disability. On the whole, these studies have identified that disability is associated with less participation and lower employment. However, the data analysed needs to be updated as it did not include the WG-SS which are a standardised measure that are intended to monitor the CRPD. The analysis in this chapter therefore aims to provide an updated and multipronged approach to estimating the relationship between disability and labour market outcomes by using a variety of disability measures and using more recent data (GHS 2011 to 2017) which includes the WG-SS.

Labour market outcomes are closely linked to educational attainment and poverty (Hinchliffe, 1987; Filmer, 2008; Mitra, Posarac & Vick, 2013a). Given the results of the previous section, part of the impact of disability on labour market outcomes is likely to operate through educational attainment: if individuals with disability have lower educational attainment than those without disability, they are likely to be less successful in the labour market even in the absence of further disabling labour market conditions. This section therefore aims to evaluate whether disability has an independent relationship with an individual's ability to participate in the labour market, gain employment and earn an income if they are selected into employment. Thus education will be used as a control variable in each of the following models, in an attempt to disentangle the roles of education and disability. The first section below will present an analysis of overall labour market participation, followed by analyses of employment and earnings. The analysis will be conducted using the same dataset as previously discussed, a pooled sample of the GHS (2011 to 2017).

5.4.1 Disability and labour market participation

Labour supply theory suggests that individuals make decisions to supply their labour based on individual factors such as the wage rate offered by the market (Killingsworth & Heckman, 1986). In addition, household decision making influences how household members divide their time between household work and market work (Becker, 1965b). In the traditional gender roles, women have historically been responsible for household production whereas men have been responsible for market work. Human capital has also been identified as a driving force behind individual labour supply. This is largely because of the returns to human capital investments in the market (Becker, 1965b; Killingsworth & Heckman, 1986). In South Africa specifically, education is associated with increased employment opportunities and higher earnings(Branson & Leibbrandt, 2013; Casale & Posel, 2002; Casale, Muller & Posel, 2004). The following probit model will be used to determine the relationship between disability and labour market participation for adults of working age (16 to 59 years):

$$LMP^{*} = \alpha'D + \delta'Z + \gamma'H + \varepsilon \qquad (5.2)$$

$$LMP = \begin{cases} 1 \; if \; LMP^{*} > 0 \\ 0 \; if \; LMP^{*} \leq 0 \end{cases}$$

Where LMP^{*} is a latent (unobserved) variable representing the desire to participate in the labour market and LMP represents a dichotomous variable that takes the value of one if a person is a labour market participant and zero if they are inactive. In the analysis that follows, LMP refers to the expanded definition of labour market participation whereby an individual is considered to be a participant if they are employed or searching unemployed, or non-searching unemployed at the time of interview. The model using the official definition, which excludes the non-searching unemployed, is presented in Appendix C, Table C8 and C10. The expanded measure of participation is used here because the descriptive statistics highlighted that employment rates for people with disabilities are lower when using the expanded measure whereas employment rates were similar to the full sample of adults when using the official measure. This implies that more people with disabilities are unemployed when using the expanded measure which includes the non-searching unemployed. People with disabilities may have difficulties searching for work once they enter the labour market. Thus for the analysis of labour market outcomes, the expanded measure is presented in the text and the official can be found in Appendix C.

Once again, D represents the disability variables and the model is estimated separately for each of the composite disability measures. An additional model containing all of the disability types is also estimated. Z refers to the individual characteristics such as race, age, gender, marital status and education and H represents the household level characteristics such as household size and

socioeconomic status. These characteristics are commonly used in analyses of labour market participation in South Africa (Casale & Posel, 2002; Burger & Jafta, 2006; Posel, Casale & Vermaak, 2014). Education is separated into dummy variables representing no schooling, primary school, incomplete secondary school, completed secondary (grade 12/matric) and tertiary education. In the regression, no schooling is used as the base category.

The probit model is estimated iteratively whereby specification I only includes the disability measures and the age variables. Specification II includes those from I as well as all of the individual-level explanatory variables such as gender, race, marital status and the education variables. Lastly, specification III is the full model consisting of all of the individual and household level variables. As mentioned, the disability indicator changes in each model such that in the first model (columns one to three) uses the broad measure of disability and has three specifications of the same model. The second model (columns four to six) uses the moderate measure of disability in three model specifications. This is repeated for the severe, UN and multiple measures of disability as well. Given that the coefficients of the probit model are themselves only useful in terms of the significance of the indicator and the direction of the relationship between the explanatory variables and the dependent variable (in this case labour market participation), the average marginal effects are calculated after the initial estimation. The marginal effects illustrate the increase in the probability of participation (in percentage points) if for example, an individual has a disability by the given measure, compared to someone without that disability.

The results in Table 5.4 show that each disability indicator has a negative and highly significant marginal effect. In the case of the three iterations of each model, the marginal effects of the disability indicator first declines in specification II but then increases again in specification III. The magnitude of the marginal effects for each disability measure are very similar in specification I and III. As a model robustness check, this indicates that the relationship between disability and labour market participation is consistent across the simple model (I) and the full model (III). The main reason why these effects change across models is because of how disability and the additional variables are correlated. Individuals with disability typically have lower education and those with lower education are less likely to participate in the labour market. By including education into model II, the marginal effect of disability decreases because education partly explains why people with disability have lower labour market participation overall. Then with the inclusion of the additional household level variables, the opposite happens with model III. For example, grant income lowers labour market participation and people with disabilities typically live in households with more grant income. When the model controls for grant income the disability participation gap is larger.

Using the broad measure, people with disabilities are eight percentage points (p.p.) less likely to participate in the labour market compared to people without disabilities whereas people with moderate disabilities are only three p.p. less likely to participate. The probability of people with severe disabilities participating in the labour market is 21 p.p. less than people without severe disabilities. This figure is 18 p.p. and 17 p.p. respectively for people with UN or multiple disabilities. These findings suggest that people with disabilities, particularly the more severe measures of disabilities, are more likely to be completely out of the labour market (inactive).

Table 5.4: Probit estimation of expanded labour force participation, by disability measure (showing marginal effects)

	Broad			Moderate			Severe			UN			Multiple		
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
Disability	-0.087***	-0.072***	-0.083***	-0.036***	-0.029***	-0.038***	-0.233***	-0.198***	-0.215***	-0.198***	-0.162***	-0.178***	-0.202***	-0.156***	-0.172***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.006)	(0.006)	(0.007)	(0.005)	(0.005)	(0.006)	(0.008)	(0.008)	(0.009)
Education:															
Primary		0.058***	0.061***		0.062***	0.065***		0.052***	0.055***		0.053***	0.056***		0.056***	0.059***
		(0.004)	(0.005)		(0.004)	(0.005)		(0.004)	(0.005)		(0.004)	(0.004)		(0.004)	(0.004)
Incomplete Secondary		0.088***	0.074***		0.094***	0.080***		0.080***	0.067***		0.081***	0.067***		0.086***	0.072***
		(0.004)	(0.005)		(0.004)	(0.005)		(0.004)	(0.005)		(0.004)	(0.005)		(0.004)	(0.005)
Matric		0.182***	0.158***		0.189***	0.164***		0.174***	0.150***		0.174***	0.150***		0.180***	0.156***
		(0.005)	(0.005)		(0.005)	(0.005)		(0.005)	(0.005)		(0.004)	(0.005)		(0.005)	(0.005)
Tertiary		0.239***	0.206***		0.243***	0.210***		0.230***	0.199***		0.230***	0.199***		0.235***	0.203***
		(0.004)	(0.005)		(0.004)	(0.005)		(0.004)	(0.005)		(0.004)	(0.005)		(0.004)	(0.005)
Demographic:															
Age	0.012	0.011	0.010	0.012	0.010	0.010	0.012	0.011	0.010	0.012	0.011	0.010	0.012	0.010	0.010
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Male		0.094***	0.107***		0.094***	0.107***		0.095***	0.108***		0.095***	0.108***		0.095***	0.108***
		(0.002)	(0.002)		(0.002)	(0.002)		(0.002)	(0.002)		(0.002)	(0.002)		(0.002)	(0.002)
African		0.002	0.055***		0.003	0.057***		0.002	0.055***		0.003	0.055***		0.003	0.056***
		(0.004)	(0.005)		(0.004)	(0.005)		(0.004)	(0.005)		(0.004)	(0.005)		(0.004)	(0.005)
Coloured		0.014***	0.047***		0.015***	0.048***		0.016***	0.047***		0.016***	0.047***		0.015***	0.048***
		(0.005)	(0.006)		(0.005)	(0.006)		(0.005)	(0.006)		(0.005)	(0.006)		(0.005)	(0.006)
Indian		-0.050***	-0.053***		-0.048***	-0.051***		-0.049***	-0.052***		-0.049***	-0.051***		-0.048***	-0.051***
		(0.007)	(0.009)		(0.007)	(0.009)		(0.007)	(0.009)		(0.007)	(0.008)		(0.007)	(0.008)
Married or living together			-0.003			-0.002			-0.004			-0.004			-0.002
			(0.002)			(0.002)			(0.002)			(0.002)			(0.002)
Divorced or widowed			0.029***			0.029***			0.027***			0.027***			0.028***
			(0.004)			(0.004)			(0.004)			(0.004)			(0.004)
Location:															
Urban			0.042***			0.042***			0.042***			0.042***			0.042***
			(0.003)			(0.003)			(0.003)			(0.003)			(0.003)
Western Cape			-0.003			-0.003			-0.000			0.001			0.000
			(0.005)			(0.005)			(0.005)			(0.005)			(0.005)
Eastern Cape			-0.053***			-0.053***			-0.052***			-0.051***			-0.052***
			(0.005)			(0.005)			(0.005)			(0.005)			(0.005)
Northern Cape			-0.007			-0.008			-0.008			-0.007			-0.008
			(0.006)			(0.006)			(0.006)			(0.006)			(0.006)
Free State			-0.004			-0.006			-0.005			-0.003			-0.004

	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
KwaZulu-Natal	0.008*	0.009**	0.010**	0.011***	0.011***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
North West	-0.005	-0.006	-0.004	-0.002	-0.003
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Mpumalanga	0.011**	0.011**	0.012**	0.014***	0.013**
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Limpopo	-0.096***	-0.094***	-0.094***	-0.092***	-0.092***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Household Characteristics:					
Number of children 15 and under	-0.000	0.001	-0.001	-0.001	-0.000
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Number of working age adults (16 to 59 years)	0.002	0.002*	0.002	0.001	0.002*
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Number of older adults (60 years +)	0.020***	0.023***	0.019***	0.019***	0.021***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Net number of employed adults	-0.013***	-0.013***	-0.012***	-0.012***	-0.013***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Household earned income	0.002***	0.002***	0.002***	0.002***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Household earned income squared	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Household other income	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Household grant income	-0.038***	-0.040***	-0.036***	-0.036***	-0.038***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Year of survey:					
2012	0.083***	0.082***	0.083***	0.082***	0.082***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
2013	0.091***	0.091***	0.091***	0.091***	0.091***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
2014	0.099***	0.099***	0.099***	0.098***	0.098***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)

2015			0.100***			0.101***			0.101***			0.101***			0.101***
			(0.003)			(0.003)			(0.003)			(0.003)			(0.003)
2016			0.090***			0.091***			0.091***			0.090***			0.090***
			(0.003)			(0.003)			(0.003)			(0.003)			(0.003)
2017			0.096***			0.097***			0.097***			0.095***			0.096***
			(0.003)			(0.003)			(0.003)			(0.003)			(0.003)
F-statistic	10550	3319	1033	10191	3257	1013	10598	3335	1041	10709	3360	1048	10463	3317	1031
Prob < F	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sample	336477	331300	329679	336477	331300	329679	335991	330823	329209	343705	338312	336572	343705	338312	336572
Population (mill)	224,964	221,245	220,146	224,964	221,245	220,146	224,635	220,922	219,828	230,196	226,310	225,128	230,196	226,310	225,128

Source: Own Calculations, Pooled GHS 2011-2017.

Note: Standard errors in parenthesis. *** significant at the 1% level, ** significant at the 5% level and * significant at the 10% level. Earnings/income values are measured in thousands of Rands per month and are inflation adjusted with 2017 as the base year.

In terms of the other explanatory variables in the model, as expected, the education dummy variables are all positive and significant with respect to participation. In particular, completed secondary education (matric) and tertiary education have the largest positive effect on the probability of participation. It is interesting to note that across each model representing a different disability measure, the marginal effects of education are consistent. For example, tertiary education increases the probability of participation by 20 p.p. irrespective of which disability measure is being used.

All of the explanatory variables are consistent across each model that represents a different measure of disability. Some of the key results of the additional explanatory variables are expected such that the probability of participation significantly increases with age and that men are more likely to be labour market participants compared to women. People are more likely to participate if they are divorced or widowed. People are significantly more likely to participate if they live in urban areas and with Gauteng as the base category for the provinces, people living in all of the other provinces, except KZN are less likely to participate compared to those living in Gauteng. Given that Gauteng is the economic hub of the country it is not surprising that this is the case. In terms of household size, the presence of older adults in the household increases the probability of participation but the more employed individuals in the household the lower the probability of a person participating in the labour market. As household income increases so the likelihood of participation declines for the individual (this is true for earned income, other income and grant income). All of the survey years are significant and positive with respect to 2011 indicating that people in the later survey years are more likely to participate than those captured in the 2011 survey.

Following this, Table 5.5 presents the correlates of expanded labour market participation by disability type. In this case only the disability indicators are presented in this table, the marginal effects of all the other explanatory variables are presented in Appendix C9 and C11. All of the same explanatory variables that were used in Table 5.4 are included here, with only the disability indicator that is changed. Here both the moderate and severe versions of all of the disability types are included in the same model. The model specifications are the same for the analysis of disability type as they were for the previous analysis of the composite disability measures.

Moderate disabilities seeing have an insignificant and negligible positive association with labour market participation based on the full model specification (III). People with severe difficulties seeing are six p.p. less likely to participate compared to people without disabilities based on specification III. The marginal effects of moderate hearing difficulties are significant and negative in model specification II and III. The marginal effects of each disability type changes across specification but in most cases specification I and III are reasonably close, the following discussion will mainly focus on the results

from model specification III. People with severe hearing difficulties are ten p.p. less likely to participate in the labour market compared to people without disabilities. In terms of physical difficulties, if these are reported as moderate, people are 11 p.p. less likely to participate and if they are severe the probability of participation is 28 p.p. lower compared to people without disabilities. These marginal effects are significant at the one percent level.

Table 5.5: Probit estimation of expanded labour force participation, by disability type (showing marginal effects)

		I	II	III
Sight				
	Moderate	0.014***	0.009***	0.001
		(0.003)	(0.003)	(0.004)
	Severe	-0.051***	-0.045***	-0.055***
		(0.008)	(0.008)	(0.009)
Hearing				
	Moderate	0.005	0.017**	0.018**
		(0.007)	(0.007)	(0.008)
	Severe	-0.121***	-0.099***	-0.101***
		(0.017)	(0.016)	(0.018)
Physical				
	Moderate	-0.127***	-0.105***	-0.112***
		(0.008)	(0.008)	(0.009)
	Severe	-0.277***	-0.257***	-0.277***
		(0.012)	(0.011)	(0.012)
Communication				
	Moderate	0.031	0.029	0.039*
		(0.022)	(0.021)	(0.023)
	Severe	-0.141***	-0.134***	-0.145***
		(0.029)	(0.029)	(0.031)
Cognitive				
	Moderate	-0.112***	-0.076***	-0.085***
		(0.008)	(0.008)	(0.008)
	Severe	-0.259***	-0.197***	-0.202***
		(0.013)	(0.013)	(0.014)
Self-care				
	Moderate	-0.038**	-0.055***	-0.062***
		(0.018)	(0.017)	(0.019)
	Severe	-0.140***	-0.131***	-0.135***
		(0.021)	(0.020)	(0.022)

Source: Own Calculations, Pooled GHS 2011-2017.

Note: Standard errors in parenthesis. *** significant at the 1% level, ** significant at the 5% level and * significant at the 10% level. Earnings/income values are measured in thousands of Rands per month and are inflation adjusted with 2017 as the base year.

The marginal effect of moderate communication difficulties is positive and significant at the ten percent level. Whereas people with severe communication difficulties are 15 percent less likely to participate. This is highly significant at the one percent level. The probability of labour market participation is significantly reduced if a person has either moderate or severe cognitive difficulties. Here the likelihood of labour market participation is 8 p.p. and 20 p.p. lower for people with moderate or severe disabilities respectively compared to people without disabilities. Having self-care difficulties also lowers the

probability of participation by 6 p.p. or 14 p.p. if a person has moderate or severe difficulties respectively. Once again, this is significant at the one percent level.

The results of the probit model for official labour market participation show smaller marginal effects of the disability and education indicators but larger positive marginal effects of being male compared to female and living in an urban area compared to rural area. There is still a significant negative relationship between disability and labour market participation. The results of the expanded measure of labour market participation, as expected, indicate that the severe disability types have a larger negative association with labour market participation. The marginal effects are largest for severe physical, cognitive, communication and self-care. Each of these disability types are potentially harder to accommodate in terms of job search and employment thus causing people to stay out of the labour market altogether. As theory suggests, if the benefits of market work outweigh the benefits of non-market work people will choose not to supply their labour to the market (Becker, 1965b). If the work environment and culture is not conducive to accommodating people with disabilities, then people with disabilities may choose or be forces to remain out of the labour force altogether. The question remains once someone does decide to participate in the labour market as to whether there are still disparities in the likelihood of employment. The following section 5.3.2.2 presents the multivariate analysis of the association between disability and employment.

5.4.2 Disability and employment

In many developed countries where unemployment rates are very low, labour market participation is treated as synonymous with employment. In developing countries such as South Africa; however, unemployment rates tend to be high thus creating the need to distinguish between an analysis of participation and that of employment. People with disabilities have typically had lower levels of employment compared to people without disabilities (Altman, 2005; Mitra, 2008; Levy & Hernandez, 2009; Mizunoya & Mitra, 2013b). In the descriptive statistics presented above, employment rates for people with disabilities were similar or slightly below that of the full sample of adults of working age, although labour market participation rates were lower especially for people with severe, UN or multiple disabilities. The multivariate analysis in section 5.3.2.1 above indicates that there is a significant negative association between disability and labour market participation. This implies that people with disabilities are more likely to be inactive compared to people without disabilities. The following analysis aims to examine the direct relationship between disability and employment. This is to ascertain whether once someone with disabilities decides to participate in the labour market they are afforded equitable opportunities to access employment.

The following probit model will be used to determine the relationship between disability and

employment for adults of working age (16 to 59 years):

$$EMP^* = \alpha'D + \delta'Z + \gamma'H + \varepsilon \qquad (5.3)$$

$$EMP = \begin{cases} 1 \text{ if } EMP^* > 0 \\ 0 \text{ if } EMP^* \leq 0 \end{cases}$$

Where EMP^* is a latent (unobserved) variable representing the ability of the individual to find employment.and EMP represents a dichotomous variable that takes the value of one if a person is employed and zero otherwise. In the analysis that follows, the sample is restricted to labour market participants only and EMP is therefore based on the expanded definition of labour market participation. As such the base category of unemployment includes both those searching and not searching for work. The official definition which excludes the non-searching unemployed is presented in Appendix C, Table 13 and C14. Once again, D represents the disability variables, and the model is estimated separately for each of the composite disability measures. An additional model containing all of the disability types is also estimated. Z refers to the individual characteristics such as race, age, gender, marital status and education and H represents the household level characteristics such as household size and socioeconomic status. These characteristics are commonly used in analyses of labour market participation in South Africa (Casale & Posel, 2002; Burger & Jafta, 2006; Posel, Casale & Vermaak, 2014).

As with the previous analysis of labour market participation, there are three model specifications of each model. Specification I once again only includes the disability indicator and age variables, specification II includes the variables from I as well as the other individual-level characteristics. Finally, specification III is the full model that includes all of the individual and household-level characteristics. The model is estimated in this manner for each of the composite disability measures (broad, moderate, severe, UN and multiple). As discussed in section 5.3.2.1 above, only the sign and significance of the probit coefficients are themselves useful whilst the magnitude of the coefficients are not and thus the average marginal effects are once again calculated after the probit estimation. These marginal effects are presented in Table 5.6 and 5.7 below.

There is little difference in the probability of employment between individuals with broad or moderate disabilities and those with no disabilities. However, individuals with severe, UN or multiple disabilities are substantially less likely to find work than their counterparts without disabilities. The first model includes the broad measure of disability in specifications I, II and III (columns one, two and three). The disability indicator is not significant in the first two specifications whereas it becomes significant and negative in the final model specification. The marginal effects are very small indicating that the

probability of employment is reduced by one p.p. if a person has a disability (broad measure) compared to people without disabilities. In the model containing the moderate measure of disability, the relationship between disability and employment is significant in specification I and II but not in III. Here the marginal effects are negligible. However, the remaining disability measures have a large negative association with employment. People with severe disabilities are six p.p. less likely to be employed compared to people without disabilities, which is significant at the one percent level. The probability of employment is reduced by five p.p. if a person has a disability (UN or multiple measure) compared to people without disabilities. The magnitudes of the marginal effects on the disability indicators are generally smaller in specification III compared to specification I in all of the models except for the model including the broad measure of disability. This implies that the initial disability difference in employment in specification one may in part be attributed to other characteristics such as educational attainment or household dynamics. However, the full model specification (III) indicates that a strong negative association between disability and employment remains after controlling for observable factors.

Table 5.6: Probit estimation of employment, by disability measure, for adults of working age 16 to 59 years (showing marginal effects)

	Broad			Moderate			Severe			UN			Multiple		
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
Disability	-0.000	0.002	-0.010**	0.012**	0.011***	-0.002	-0.068***	-0.053***	-0.056***	-0.071***	-0.046***	-0.053***	-0.079***	-0.041***	-0.049***
	(0.005)	(0.004)	(0.004)	(0.005)	(0.004)	(0.005)	(0.010)	(0.009)	(0.011)	(0.009)	(0.008)	(0.009)	(0.013)	(0.011)	(0.013)
Education:															
Primary		-0.012	-0.008		-0.012	-0.008		-0.012	-0.009		-0.013	-0.010		-0.013	-0.010
		(0.008)	(0.009)		(0.008)	(0.009)		(0.008)	(0.009)		(0.008)	(0.009)		(0.008)	(0.009)
Incomplete Secondary		0.015*	0.007		0.015*	0.008		0.015*	0.007		0.013	0.005		0.014*	0.005
		(0.008)	(0.009)		(0.008)	(0.009)		(0.008)	(0.009)		(0.008)	(0.009)		(0.008)	(0.009)
Matric		0.087***	0.076***		0.087***	0.076***		0.086***	0.075***		0.084***	0.073***		0.085***	0.074***
		(0.009)	(0.009)		(0.009)	(0.009)		(0.009)	(0.009)		(0.009)	(0.009)		(0.009)	(0.009)
Tertiary		0.209***	0.176***		0.209***	0.176***		0.209***	0.176***		0.207***	0.173***		0.207***	0.174***
		(0.008)	(0.008)		(0.008)	(0.008)		(0.008)	(0.008)		(0.008)	(0.008)		(0.008)	(0.008)
Demographic															
Age	0.042***	0.038***	0.034***	0.042***	0.038***	0.034***	0.041***	0.038***	0.034***	0.041***	0.038***	0.034***	0.041***	0.038***	0.034***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Age Squared	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Male		0.086***	0.089***		0.086***	0.089***		0.086***	0.090***		0.086***	0.090***		0.086***	0.090***
		(0.002)	(0.003)		(0.002)	(0.003)		(0.002)	(0.003)		(0.002)	(0.003)		(0.002)	(0.003)
African		-0.240***	-0.187***		-0.240***	-0.187***		-0.240***	-0.187***		-0.239***	-0.187***		-0.239***	-0.186***
		(0.007)	(0.007)		(0.007)	(0.007)		(0.007)	(0.007)		(0.007)	(0.007)		(0.007)	(0.007)
Coloured		-0.147***	-0.136***		-0.147***	-0.136***		-0.147***	-0.136***		-0.147***	-0.136***		-0.147***	-0.136***
		(0.009)	(0.010)		(0.009)	(0.010)		(0.009)	(0.010)		(0.009)	(0.010)		(0.009)	(0.010)
Indian		-0.077***	-0.063***		-0.077***	-0.063***		-0.077***	-0.063***		-0.078***	-0.065***		-0.078***	-0.064***
		(0.014)	(0.014)		(0.014)	(0.014)		(0.014)	(0.014)		(0.014)	(0.014)		(0.014)	(0.014)
Married or living together			0.071***			0.071***			0.070***			0.071***			0.071***
			(0.003)			(0.003)			(0.003)			(0.003)			(0.003)
Divorced or widowed			0.062***			0.062***			0.062***			0.062***			0.062***
			(0.005)			(0.005)			(0.005)			(0.005)			(0.005)
Location:															
Urban			0.038***			0.038***			0.037***			0.038***			0.038***
			(0.004)			(0.004)			(0.004)			(0.004)			(0.004)
Western Cape			0.056***			0.056***			0.057***			0.057***			0.056***
			(0.006)			(0.006)			(0.006)			(0.006)			(0.006)
Eastern Cape			0.014**			0.014**			0.014**			0.015***			0.015***

	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Northern Cape	0.006	0.006	0.006	0.006	0.006
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Free State	-0.032***	-0.032***	-0.032***	-0.031***	-0.032***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
KwaZulu-Natal	0.022***	0.022***	0.022***	0.022***	0.022***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
North West	-0.001	-0.002	-0.001	-0.000	-0.001
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Mpumalanga	0.026***	0.026***	0.026***	0.025***	0.025***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Limpopo	0.055***	0.055***	0.055***	0.056***	0.056***
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Household Characteristics:					
Number of children 15 and under	-0.014***	-0.014***	-0.014***	-0.014***	-0.014***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Number of working age adults (16 to 59 years)	-0.041***	-0.041***	-0.041***	-0.041***	-0.041***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Number of older adults (60 years +)	-0.043***	-0.043***	-0.043***	-0.044***	-0.043***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Net number of employed adults	0.061***	0.061***	0.061***	0.061***	0.061***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Household grant income	-0.018***	-0.018***	-0.018***	-0.018***	-0.018***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Year of survey:					
2012	-0.070***	-0.070***	-0.070***	-0.071***	-0.071***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
2013	-0.079***	-0.079***	-0.079***	-0.079***	-0.079***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
2014	-0.093***	-0.093***	-0.092***	-0.093***	-0.093***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
2015	-0.092***	-0.092***	-0.092***	-0.093***	-0.093***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
2016	-0.095***	-0.095***	-0.095***	-0.095***	-0.095***

	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
2017	-0.097***	-0.097***	-0.097***	-0.097***	-0.097***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)

Source: Own Calculations, Pooled GHS 2011-2017.

Note: Standard errors in parenthesis. *** significant at the 1% level, ** significant at the 5% level and * significant at the 10% level. Earnings/income values are measured in thousands of Rands per month and are inflation adjusted with 2017 as the base year.

In terms of the other key explanatory variables, completed secondary education (matric) and tertiary education are significantly positively associated with being employed compared to people without education. People with tertiary education are 17 p.p. more likely to be employed than those with no schooling. Men are nine percent more likely to be employed compared to women. The probability of Africans being employed is 19 p.p. lower compared to White people and Coloured people are 14 p.p. less likely to be employed compared to White people. The marginal effects of race are highly significant and, aside from education, represent the largest effects on employment.

All of the household size variables are significant but the marginal effects of these indicators on employment are negative. This implies that the larger the household, the less likely someone is to be employed. This is the case for children, working age adults and older adults. The more employed individuals living in the home (other than the individual), the higher the probability of employment for the individual themselves, potentially as a result of social capital making job search easier.

Table 5.7 below presents the results of the model that includes each disability type. Here the overall model is the same as that presented in Table 5.6 above, with the only difference being the disability indicators used. Here each of the disability types, both moderate and severe are included in the same model. The marginal effects of the disability indicators decrease as the additional explanatory variables are added into the model. For simplicity, specification III will be discussed as this represents the full model and thus reflects the direct relationship between disability type and employment whilst holding all other explanatory variables constant. The probability of employment increases by one p.p. for people with moderate difficulties seeing compared to people without disabilities whilst the likelihood of someone with severe difficulties seeing being employed is two p.p. lower compared to people without disabilities. Both of these are significant at the ten percent level. Moderate hearing difficulties reduce the likelihood of employment by two p.p. but the marginal effect of severe hearing difficulties is insignificant.

Table 5.7: Probit estimation of employment, by disability type, for adults of working age 16 to 59 years (showing marginal effects)

		I	II	III
Seeing				
	Moderate	0.039***	0.026***	0.013**
		(0.005)	(0.005)	(0.005)
	Severe	-0.013	-0.013	-0.024*
		(0.014)	(0.013)	(0.013)
Hearing				
	Moderate	-0.032***	-0.010	-0.021*
		(0.012)	(0.011)	(0.013)
	Severe	-0.051*	-0.043	-0.040
		(0.026)	(0.027)	(0.030)
Mobility				
	Moderate	-0.077***	-0.049***	-0.068***
		(0.015)	(0.014)	(0.015)
	Severe	-0.111***	-0.106***	-0.111***
		(0.025)	(0.023)	(0.026)
Communication				
	Moderate	0.119***	0.071**	0.097***
		(0.041)	(0.035)	(0.037)
	Severe	0.050	0.005	0.033
		(0.057)	(0.054)	(0.059)
Cognitive				
	Moderate	-0.096***	-0.037***	-0.038***
		(0.013)	(0.012)	(0.013)
	Severe	-0.129***	-0.046*	-0.029
		(0.025)	(0.024)	(0.027)
Self-care				
	Moderate	-0.022	-0.037	-0.018
		(0.040)	(0.034)	(0.037)
	Severe	-0.092**	-0.097**	-0.072
		(0.046)	(0.040)	(0.047)
F-statistic		2272	1669	797
Prob < F		0	0	0
Sample		335844	330687	329074
Population		224545519	220841882	219748720

Source: Own Calculations, Pooled GHS 2011-2017.

Note: Standard errors in parenthesis. *** significant at the 1% level, ** significant at the 5% level and * significant at the 10% level. Earnings/income values are measured in thousands of Rands per month and are inflation adjusted with 2017 as the base year.

People with moderate or severe mobility difficulties are seven p.p. or 11 p.p. less likely to be employed compared to people without disabilities. The marginal effects of severe mobility limitations represent the largest negative association between disability and employment and suggest that people with mobility limitations are the least likely to be accommodated in the workplace. Severe communication and cognitive difficulties are insignificant. This may be due to the fact that the previous section found that people with these disability types are less likely to participate in the labour market and also have fewer years of education compared to people without disabilities. The moderate versions of these disability types are significant. Adults with moderate communication difficulties are 10 p.p. more likely to be employed whereas adults with moderate cognitive difficulties are four p.p. less likely to be employed. None of the self-care disability indicators are significant.

The results presented in this section suggest that disability is negatively associated with employment on the whole. For some disability types, notably severe physical disabilities, the negative relationship is particularly large in comparison to the other disability types. In certain cases, the marginal effects of the severe disability types on employment are insignificant and this could be attributed to people with severe disabilities being less likely to participate in the labour market altogether. It should be noted that the findings for people with disabilities are similar in using the official definition of participation. People with disabilities based on the severe, UN and multiple measures are less likely to find employment compared to people without disabilities. The marginal effects of the disability indicators are slightly smaller for the official probit estimation compared to the expanded. The full set of results for the official definition can be found in Appendix C, Table C15 and C16. The final section of this analysis will estimate the relationship between disability and earnings to assess the extent of discrimination in earnings when people with disabilities are able to find employment.

5.4.3 Disability and earnings

The previous sets of analysis have identified negative associations between disability and educational attainment, disability and labour market participation, and disability and employment. The final objective of this chapter is to establish whether there is an earnings differential between people with and without disabilities once people are selected into employment. Here, both OLS regression analysis and Oaxaca-Blinder decomposition will be estimated to establish the nature of the association between disability and earnings for adults of working age.

The GHS asks respondents to report their gross earnings from employment as either a specific value or within an earnings category. The variable for earnings was therefore created as a continuous variable combining these two questions. In the case of the categories, the midpoint of each category was selected in order to assign a specific value to each respondent. This method of imputation is commonly used due to simplicity and transparency. In this study, of all of the income values, 29% are derived from categories. Typical South African household surveys use a bracket structure that display reasonable stability in terms of earnings imputations, regardless of whether a complex or simple technique is applied (Von Fintel, 2007). Individuals were also asked to report their earnings as yearly, monthly or weekly figures but for this study all reported earnings were adjusted to monthly earnings. Given that this analysis utilises a pooled sample of the GHS from 2011 to 2017, each year's earnings were adjusted for inflation using 2017 as the base year. One limitation of the data is that there are some people who report employment but their earnings information is missing. Within the sample population of 154 449 employed individuals aged 16 to 59 years, 126 824 report earnings, which leaves 27 625 people with missing earnings information. The proportion of missing data for people with disabilities who are employed is relatively low: for broad it is nine percent, seven percent for moderate, three percent for

severe, four percent for UN and two percent for multiple. These proportions are calculated based on the total number of missing income values in the population of working age employed individuals.

Missing data is not necessarily equivalent to zero earnings as people may have simply chosen not to report their earnings, a phenomenon common among higher income earners (Kerr, 2021). An analysis of this missing data is beyond the scope of this study; however, the GHS earnings data as it stands is considered to be more reliable than that obtained from the QLFS because the variance of the log earnings is stable from 2000 to 2018 when compared to income data from IRP5 tax certificates (Kerr, 2021).

An OLS model is a linear regression model that estimates the relationship between a continuous dependent variable such as earnings and a set of explanatory variables including the disability measures. One of the limitations of using OLS for this analysis of earnings is that there is likely to be non-random sample selection present in the data. The sample of people who report earnings is not a random sample of the population, as individuals are first selected into participation and then into employment. If unobservable factors that explain selection are correlated with unobservable factors that explain earnings, then the results of an earnings model estimated by OLS may be biased (Greene, 2012). Of particular concern for this research, people with disabilities have been shown to be disproportionately out of the labour market compared to people without disabilities, and those that participate are also less likely to find employment than people without disabilities. Unmeasurable aspects of disability may therefore be correlated with these selection mechanisms and with earnings.

An alternative estimation method is Heckman two-stage analysis, but this is not without its own problems (Ospino, Vasquez & Narvaez, 2010). A Heckman two-stage model estimates separate regressions for the determinants of labour market participation and for earnings, conditioning the earnings estimation on the selection model. This methodology accounts for the unobserved factors that select people into the labour market which then also determine wages (Greene, 2012). However, in South Africa three stages to the earnings process are required rather than the stipulated two. Selection into the South African labour market far from guarantees employment, with a large share of labour market participants remaining unemployed. There are two stages to employment in South Africa, the first operating through labour market participation and then from participation to employment. Thereafter is the final step from employment to earnings. Under these circumstances, a three-stage Heckman model would be required. While this is feasible in theory, it requires the identification of at least one factor that explains participation but not employment, and another factor that explains employment but not earnings. It is very challenging to identify such variables in cross-sectional data.

In the context of disability research, it has been argued that it is preferable to use multiple model specifications where additional explanatory variables are added iteratively to determine whether the observed differences in earnings are adjusted after controlling for additional characteristics, rather than employing a Heckman-type solution to the sample selection issue (Longhi, Nicoletti & Platt, 2012). Using an iterative approach shows whether the disability indicators change upon inclusion of the additional explanatory variables. For example, if the disability indicators change it could be because the initial effect of disability is affected by pre-labour market factors such as education. The results may be affected by sample selection bias and as such should be interpreted as correlations with earnings that are conditional on selection into employment.

The OLS model for earnings is represented by the following equation:

$$LOGINC = \alpha' D + \delta' Z + \gamma' H + \varepsilon \qquad (5.4)$$

Where LOGINC is the natural logarithm of monthly earnings from employment, D represents the disability measures, Z the individual characteristics and H the household-level characteristics. As with the previous models for labour market participation and employment, each model will have three specifications. The first specification (I) is includes only the disability measure and age variables, the second (II) also includes the individual level characteristics such as education, race, gender and marital status and the third (III) includes the full set of explanatory variables including the household level characteristics. These three specifications are estimated separately for each disability measure.

Table 5.8 presents the coefficients for all of the explanatory variables. In each case, the coefficient on the disability indicator gets smaller as more explanatory variables are added to the model. This means that the initial relationship between disability and earnings in specification I is inflated as a result of other factors such as education or race that are correlated with disability. Disability and age alone explain less than two percent of the variation in earnings, while the full model specification has explanatory power of close to 50 percent. None of the coefficients on the broad and moderate measure of disability are significant, indicating that once employed, earnings do not differ between people with and without these disabilities. However, people with severe, UN or multiple measures of disability earn less on average compared to people without disabilities and these coefficients are significant at the ten percent and one percent level respectively. People with severe disabilities earn approximately six percent less than people without disabilities whereas people with UN disabilities earn seven percent less. Adults with multiple disabilities earn 10 percent less on average compared to people without. This finding suggests once again that labour market outcomes for people with more severe forms of disability are worse than people without disabilities.

Table 5.8: An OLS model showing the relationship between disability and earnings for adults of working age (16 – 59), by disability measure

	Broad			Moderate			Severe			UN			Multiple		
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
Disability	0.005	-0.002	-0.014	0.034	0.006	-0.007	-0.194***	-0.058*	-0.057*	-0.266***	-0.067***	-0.067***	-0.387***	-0.094***	-0.096***
	(0.022)	(0.013)	(0.012)	(0.023)	(0.013)	(0.013)	(0.0502)	(0.030)	(0.030)	(0.0389)	(0.024)	(0.023)	(0.053)	(0.035)	(0.035)
Primary		0.150***	0.142***		0.150***	0.142***		0.149***	0.141***		0.153***	0.144***		0.153***	0.144***
		(0.022)	(0.021)		(0.022)	(0.021)		(0.022)	(0.021)		(0.021)	(0.021)		(0.021)	(0.021)
Incomplete Secondary		0.475***	0.413***		0.475***	0.413***		0.474***	0.412***		0.474***	0.411***		0.475***	0.412***
		(0.022)	(0.021)		(0.021)	(0.021)		(0.021)	(0.021)		(0.021)	(0.021)		(0.021)	(0.021)
Matric		0.957***	0.866***		0.957***	0.866***		0.956***	0.865***		0.955***	0.863***		0.955***	0.863***
		(0.023)	(0.022)		(0.022)	(0.022)		(0.022)	(0.022)		(0.022)	(0.022)		(0.022)	(0.022)
Tertiary		1.701***	1.597***		1.701***	1.597***		1.701***	1.597***		1.700***	1.595***		1.701***	1.595***
		(0.024)	(0.023)		(0.024)	(0.023)		(0.024)	(0.023)		(0.024)	(0.023)		(0.024)	(0.023)
Age	0.075***	0.0407***	0.039***	0.075***	0.040***	0.039***	0.074***	0.040***	0.039***	0.074***	0.040***	0.039***	0.074***	0.040***	0.039***
	(0.004)	(0.003)	(0.002)	(0.004)	(0.002)	(0.005)	(0.00)	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)	(0.003)	(0.002)	(0.002)
Age Squared	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Female		-0.287***	-0.278***		-0.287***	-0.278***		-0.287***	-0.278***		-0.286***	-0.278***		-0.286***	-0.278***
		(0.007)	(0.006)		(0.007)	(0.006)		(0.007)	(0.006)		(0.007)	(0.006)		(0.007)	(0.006)
African		-0.728***	-0.672***		-0.728***	-0.672***		-0.728***	-0.672***		-0.727***	-0.671***		-0.727***	-0.671***
		(0.016)	(0.017)		(0.016)	(0.017)		(0.016)	(0.017)		(0.016)	(0.017)		(0.016)	(0.017)
Coloured		-0.529***	-0.477***		-0.529***	-0.477***		-0.529***	-0.476***		-0.528***	-0.475***		-0.529***	-0.475***
		(0.019)	(0.020)		(0.019)	(0.020)		(0.019)	(0.020)		(0.019)	(0.020)		(0.019)	(0.020)
Indian		-0.136***	-0.131***		-0.136***	-0.131***		-0.135***	-0.129***		-0.136***	-0.131***		-0.137***	-0.132***
		(0.030)	(0.030)		(0.030)	(0.030)		(0.030)	(0.030)		(0.030)	(0.030)		(0.030)	(0.030)
Married or living together		0.197***	0.178***		0.197***	0.178***		0.196***	0.178***		0.194***	0.175***		0.194***	0.175***
		(0.008)	(0.008)		(0.008)	(0.008)		(0.008)	(0.008)		(0.008)	(0.008)		(0.008)	(0.008)
Divorced or widowed		0.038***	0.045***		0.038***	0.045***		0.039***	0.045***		0.038***	0.045***		0.038***	0.045***
		(0.013)	(0.013)		(0.013)	(0.013)		(0.013)	(0.013)		(0.013)	(0.013)		(0.013)	(0.013)
Formal		0.697***	0.687***		0.697***	0.687***		0.697***	0.687***		0.696***	0.686***		0.696***	0.686***
		(0.010)	(0.010)		(0.010)	(0.010)		(0.010)	(0.010)		(0.010)	(0.009)		(0.010)	(0.009)
Urban			0.262***			0.262***			0.262***			0.263***			0.263***
			(0.012)			(0.012)			(0.012)			(0.012)			(0.012)
Western Cape			-0.145***			-0.145***			-0.144***			-0.145***			-0.146***
			(0.015)			(0.015)			(0.015)			(0.015)			(0.015)

Eastern Cape			-0.345***			-0.345***			-0.344***			-0.344***			-0.344***
			(0.018)			(0.018)			(0.018)			(0.018)			(0.018)
Northern Cape			-0.284***			-0.284***			-0.283***			-0.283***			-0.283***
			(0.024)			(0.024)			(0.024)			(0.024)			(0.024)
Free State			-0.275***			-0.275***			-0.275***			-0.272***			-0.272***
			(0.019)			(0.019)			(0.019)			(0.019)			(0.019)
KwaZulu-Natal			-0.162***			-0.162***			-0.162***			-0.160***			-0.160***
			(0.016)			(0.016)			(0.016)			(0.016)			(0.016)
North West			-0.077***			-0.077***			-0.075***			-0.074***			-0.075***
			(0.018)			(0.018)			(0.018)			(0.018)			(0.018)
Mpumalanga			-0.071***			-0.071***			-0.070***			-0.070***			-0.070***
			(0.021)			(0.021)			(0.021)			(0.021)			(0.021)
Limpopo			-0.126***			-0.126***			-0.125***			-0.128***			-0.128***
			(0.020)			(0.020)			(0.020)			(0.020)			(0.020)
Twelve			0.012			0.012			0.012			0.014			0.014
			(0.014)			(0.014)			(0.014)			(0.014)			(0.014)
Thirteen			0.008			0.007			0.008			0.010			0.010
			(0.015)			(0.015)			(0.015)			(0.015)			(0.015)
Fourteen			-0.011			-0.011			-0.012			-0.005			-0.005
			(0.015)			(0.015)			(0.015)			(0.015)			(0.015)
Fifteen			0.011			0.011			0.012			0.016			0.016
			(0.013)			(0.013)			(0.013)			(0.013)			(0.013)
Sixteen			0.0131			0.0132			0.012			0.015			0.015
			(0.013)			(0.013)			(0.013)			(0.013)			(0.013)
Seventeen			0.006			0.006			0.006			0.008			0.008
			(0.013)			(0.013)			(0.013)			(0.013)			(0.013)
Constant	6.766***	6.638***	6.633***	6.762***	6.637***	6.631***	6.772***	6.640***	6.632***	6.784***	6.643***	6.632***	6.781***	6.642***	6.631***
	(0.0733)	(0.055)	(0.057)	(0.0732)	(0.0557)	(0.057)	(0.0732)	(0.0556)	(0.057)	(0.0726)	(0.0551)	(0.057)	(0.0725)	(0.0551)	(0.0569)
Observations	487,243	485,828	485,828	487,243	485,828	485,828	487,049	485,635	485,635	489,856	488,395	488,395	489,856	488,395	488,395
R-squared	0.017	0.449	0.467	0.017	0.449	0.467	0.017	0.449	0.467	0.018	0.448	0.466	0.018	0.448	0.466

Source: Own Calculations, Pooled GHS 2011-2017.

Note: Standard errors in parenthesis. *** significant at the 1% level, ** significant at the 5% level and * significant at the 10% level. Earnings/income values are measured in thousands of Rands per month and are inflation adjusted with 2017 as the base year.

All of the education dummy variables are positive and significant with large coefficients, indicating that education substantially increases earnings. This is to be expected given the well-established literature on human capital theory as well as studies in South Africa that have identified this relationship (Branson & Leibbrandt, in press; Becker, 1962). Women earn less than men on average and all race groups (African, Coloured and Indian) earn less than White people. Age (at a diminishing rate), being married, employment in the formal sector and living in an urban area are positively associated with earnings. There are no significant independent changes in real earnings across the survey years.

Table 5.9 below presents the final OLS model for earnings where the disability indictor includes all of the disability types (both moderate and severe) based on the six domains of functioning in the WG-SS. Earnings are higher for people with moderate difficulties seeing but are lower for people with either moderate or severe hearing difficulties. People with severe hearing difficulties earn 18 percent less than people without disabilities. The coefficient on severe physical disabilities is insignificant, which may be as a result of people with this particular disability type being less likely to find employment as was established in the previous section. Adults with moderate physical disabilities earn 14 percent less than people without disabilities. Moderate communication difficulties are positively associated with earnings. In the case of moderate seeing and communication difficulties, these may have been acquired later in life or they are easier to accommodate in the workplace and thus do not impact on a person's earnings. Cognitive difficulties are negatively associated with earnings irrespective of whether they are moderate or severe. People with moderate cognitive difficulties earn 20 percent less and people with severe cognitive difficulties earn 18 percent less on average compared to people without disabilities. Difficulties with self-care do not have any independent relationship with earnings.

Table 5.9: An OLS model showing the relationship between disability and earnings for adults of working age (16 – 59), by disability type

		I	II	III
Seeing				
	Moderate	0.179***	0.0549***	0.0360**
		(0.0251)	(0.0154)	(0.0151)
	Severe	0.0400	0.0330	0.0274
		(0.0653)	(0.0372)	(0.0375)
Hearing				
	Moderate	-0.278***	-0.0927***	-0.0811**
		(0.0513)	(0.0354)	(0.0348)
	Severe	-0.394***	-0.212**	-0.183**
		(0.127)	(0.0909)	(0.0882)
Mobility				
	Moderate	-0.425***	-0.144***	-0.143***
		(0.0579)	(0.0415)	(0.0406)
	Severe	-0.0164	-0.0325	-0.0350
		(0.123)	(0.0830)	(0.0862)
Communication				
	Moderate	0.629***	0.372***	0.382***
		(0.201)	(0.129)	(0.125)
	Severe	0.367	0.230	0.192
		(0.229)	(0.161)	(0.164)
Cognition				
	Moderate	-0.699***	-0.210***	-0.199***
		(0.0570)	(0.0438)	(0.0434)
	Severe	-0.880***	-0.191***	-0.182***
		(0.0960)	(0.0635)	(0.0649)
Self-care				
	Moderate	0.379*	0.0449	0.0254
		(0.203)	(0.137)	(0.130)
	Severe	0.0378	-0.0920	-0.108
		(0.358)	(0.306)	(0.311)
Observations		487,014	485,602	485,602
R-squared		0.022	0.450	0.468

Source: Own Calculations, Pooled GHS 2011-2017.

Note: Standard errors in parenthesis. *** significant at the 1% level, ** significant at the 5% level and * significant at the 10% level. Earnings/income values are measured in thousands of Rands per month and are inflation adjusted with 2017 as the base year.

The earnings analysis has established that, for some disability measures and specific types of disabilities, there is a negative relationship between disability and earnings. However, one limitation of this analysis is the sample selection bias that may arise due to the sample being non-random as a result of people with disabilities being less likely to participate in the labour market and find employment compared to people without disabilities. For example, if people with disabilities who participate in the labour market and find work are especially highly motivated or are able to access reasonable accommodations in unmeasured ways, relative to those with disabilities who are not employed, then the disability earnings gap between people with and without disabilities for those in employment may under-estimate the true relationship for the population as a whole. Once employed, factors such as education, race, location and whether a person works in the formal sector are significant drivers of earnings and have a larger effect on earnings in comparison to disability. In order to interrogate this relationship between earnings and disability further, an Oaxaca-Blinder decomposition will be used to

establish the extent to which the difference in earnings between individuals with and without disabilities can be explained by factors such as differential access to education.

An Oaxaca-Blinder decomposition is a common methodology used to analyse differences in labour market outcomes by groups such as race and gender. It does this by decomposing the mean difference in the log of wages between two groups, so as to attribute the wage gap to differences in the group members' observable characteristics or to other factors (Blinder, 1973; Oaxaca, 1973; Jann, 2008), in this case between people with and without disabilities. Similar to the OLS earnings models presented in the previous section, the Oaxaca-Blinder decomposition is conducted for individuals who are employed and who report their earnings. A decomposition analysis that is unable to account for sample selection may lead to under or over estimation of the extent of wage discrimination (Ospino, 2010).

The three-fold Oaxaca-Blinder (O-B) model is given as follows:

$$\bar{y_A} - \bar{y_B} = \Delta\bar{X}\beta_A + \bar{X_A}\Delta\beta + \Delta\bar{X}\Delta\beta = E + C + CE \qquad (5.5)$$

Where:

y: Log of monthly income from employment

A: People without disabilities

B: People with disabilities

E: Gap in endowments (explained)

C: Gap in coefficients (unexplained)

CE: Interaction of differences in endowments and coefficients

As the equation above suggests, the difference in mean earnings is estimated for two groups, namely people with disabilities and people without. The model used in this analysis is the three-fold model where the gap in earnings is divided into three components, the first being the gap in endowments, the second being the gap in the coefficients and the third being the interaction term which measures the simultaneous effect of the differences in endowments and coefficients (Jann, 2008; Ospino, Vasquez & Narvaez, 2010). The three-fold model is preferred to the two-fold model because it separates out the interaction term allowing the full effect of the endowments and coefficients to be reflected (O'Donnell et al., 2008). The gap in endowments measured the mean increase in the earnings of people with disabilities that would occur if they had the same characteristics as people without disabilities. The gap in coefficients quantifies the change in the earnings of people with disabilities that occurs when applying the coefficients of the people without disabilities to the characteristics of people with disabilities. The coefficients gap is sometimes interpreted as a reflection of discrimination (Ospino, Vasquez & Narvaez,

2010). The interaction term measures the simultaneous effect of both the gap in endowments and the gap in coefficients (Jann, 2008; Ospino, Vasquez & Narvaez, 2010).

The Oaxaca-Blinder decomposition explicitly attributes part of the wage gap to the difference in the level of endowments. However, the limitation of the model is that is unable to determine the reasons why the differences in endowments exist. In other words, it is unable to determine the extent to which discrimination may explain why people with disabilities have less education overall. The model assists in understanding the consequences of the endowments in terms of the wage effects but not the reasons why these gaps exist.

Table 5.10 below presents the results of the decomposition analysis for each of the composite disability measures. The first part of the table shows the overall difference in the mean log of earnings between individuals without and with disabilities, and the sizes of the three components in the three-fold decomposition. Thereafter, each component namely endowments, coefficients and interaction is disaggregated into the share that is explained by the individual factors included in the model. The contributions are presented both as differences in log earnings and the percentage relative to the size of the total gap. The contributions can be negative (when they lower the relative earnings of individuals without disabilities relative to people with disabilities) or positive (when they raise the earnings of those without disabilities relative to those with disabilities). In the case of the broad or moderate measure of disability, the gap in earnings is negative and small in magnitude, indicating that people with disabilities earn somewhat more than people without. The endowment effect in both cases is the biggest of the three components and is negative, indicating that if people with disabilities had the same characteristics as people without disabilities, they would earn less than people without disabilities. In both the broad and moderate models, age explains the largest portion of the disability wage gap. This suggests, as previously discussed, that people with broad or moderate disabilities are more likely to have acquired their disabilities later in life or that their disabilities are easier to accommodate thus not negatively impacting their earnings potential relative to people without disabilities.

Table 5.10: Oaxaca-Blinder decomposition analysis of earnings for adults of working age (16 – 59 years)

	Broad	% of Total Gap	Moderate	% of Total Gap	Severe	% of Total Gap	UN	% of Total Gap	Multiple	% of Total Gap
Overall Effects:										
People without disabilities	8.390***		8.389***		8.396***		8.400***		8.399***	
	(0.008)		(0.008)		(0.008)		(0.008)		(0.008)	
People with disabilities	8.458***		8.485***		8.254***		8.195***		8.076***	
	(0.022)		(0.023)		(0.051)		(0.039)		(0.052)	
Difference	-0.068***	100.000	-0.097***	100.000	0.142***	100.000	0.205***	100.000	0.323***	100.000
	(0.022)		(0.023)		(0.051)		(0.039)		(0.052)	
Endowments	-0.083***	122.059	-0.105***	108.247	0.085**	59.859	0.136***	66.341	0.225***	69.659
	(0.017)		(0.018)		(0.039)		(0.029)		(0.037)	
Coefficients	0.008	-11.764	0.005	-5.155	0.043	30.281	0.030	14.634	0.020	6.192
	(0.014)		(0.015)		(0.039)		(0.030)		(0.043)	
Interaction	0.007	-10.294	0.003	-3.092	0.015	10.563	0.039**	19.024	0.078**	24.149
	(0.008)		(0.009)		(0.022)		(0.018)		(0.031)	
Endowments:										
Education	-0.002	2.94118	-0.015	15.464	0.087***	61.267	0.115***	56.097	0.163***	50.464
	(0.009)		(0.009)		(0.022)		(0.016)		(0.019)	
Age	-0.074***	108.824	-0.073***	75.258	-0.072***	-50.704	-0.080***	-39.024	-0.089***	-27.554
	(0.003)		(0.003)		(0.005)		(0.004)		(0.006)	
Female	0.026***	-38.235	0.026***	-26.804	0.024***	16.901	0.023***	11.219	0.023***	7.121
	(0.002)		(0.002)		(0.004)		(0.003)		(0.005)	
Marital status	-0.013***	19.117	-0.014***	14.4329	-0.005	-3.521	-0.006**	-2.927	-0.006*	-1.858
	(0.002)		(0.002)		(0.003)		(0.002)		(0.003)	
Population group	-0.026***	38.235	-0.028***	28.866	-0.007	-4.929	0.009	4.390	0.028***	8.669
	(0.006)		(0.006)		(0.011)		(0.008)		(0.009)	
Formal sector employment	0.019***	-27.941	0.015***	-15.464	0.047***	33.099	0.062***	30.244	0.089***	27.554
	(0.004)		(0.004)		(0.010)		(0.008)		(0.013)	
Urban	-0.006***	8.824	-0.007***	7.217	0.008*	5.634	0.009**	4.390	0.012**	3.715
	(0.002)		(0.002)		(0.004)		(0.004)		(0.005)	
Province	-0.006**	8.824	-0.007***	7.216	0.004	2.817	0.004	1.951	0.004	1.238

	(0.002)		(0.003)		(0.004)		(0.004)		(0.005)	
Year	-0.001	1.471	-0.000	0.00	-0.001	-0.704	-0.001	-0.488	-0.000	0.000
	(0.000)		(0.000)		(0.001)		(0.001)		(0.001)	
Coefficients:										
Education	-0.057	83.824	-0.045	46.392	-0.092	-64.788	-0.002	-0.976	0.060	18.576
	(0.053)		(0.057)		(0.108)		(0.088)		(0.124)	
Age	0.281	-413.235	0.269	-277.32	0.221	155.633	0.292	142.439	0.190	58.824
	(0.180)		(0.196)		(0.433)		(0.338)		(0.516)	
Female	0.006	-8.824	0.007	-7.216	-0.003	-2.113	0.006	2.927	0.035	10.835
	(0.010)		(0.011)		(0.028)		(0.021)		(0.033)	
Marital status	0.004	-5.882	-0.001	1.031	0.048	33.803	0.027	13.171	0.041	12.693
	(0.017)		(0.018)		(0.043)		(0.034)		(0.052)	
Population group	-0.114***	167.647	-0.126***	129.897	0.028	19.718	-0.021	-10.244	-0.070	-21.671
	(0.041)		(0.044)		(0.097)		(0.078)		(0.116)	
Formal sector employment	-0.155***	227.941	-0.140***	144.329	-0.201***	-141.549	-0.244***	-119.024	-0.233***	-72.136
	(0.024)		(0.025)		(0.056)		(0.045)		(0.069)	
Urban	0.010	-14.705	-0.003	3.092	0.089	62.676	0.054	26.341	-0.001	-0.309
	(0.024)		(0.026)		(0.057)		(0.045)		(0.065)	
Province	0.043*	-63.235	0.050**	-51.546	-0.046	-32.394	-0.025	-12.195	-0.052	-16.099
	(0.023)		(0.024)		(0.058)		(0.044)		(0.067)	
Year	0.031	-45.588	0.029	-29.896	0.045	31.690	0.085	41.463	0.112	34.674
	(0.029)		(0.031)		(0.063)		(0.056)		(0.095)	
Interaction:										
Education	0.006*	-8.824	0.005	-5.155	0.008	5.634	0.003	1.463	0.003	0.928
	(0.003)		(0.003)		(0.011)		(0.011)		(0.020)	
Age	-0.014*	20.588	-0.013	13.402	-0.017	-11.972	-0.002	-0.976	0.016	4.953
	(0.008)		(0.008)		(0.019)		(0.015)		(0.025)	
Female	0.001	-1.471	0.002	-2.062	-0.001	-0.704	0.001	0.488	0.007	2.167
	(0.002)		(0.002)		(0.005)		(0.004)		(0.006)	
Marital status	0.004	-5.882	0.004	-4.124	-0.000	0.00	0.003	1.463	0.010	3.095
	(0.004)		(0.004)		(0.006)		(0.006)		(0.011)	
Population group	0.006**	-8.824	0.008***	-8.247	0.001	0.704	0.000	0.000	0.006	1.857
	(0.002)		(0.003)		(0.004)		(0.002)		(0.012)	

Formal sector employment	0.006***	-8.824	0.004***	-4.124	0.018***	12.676	0.029***	14.146	0.039***	12.074
	(0.001)		(0.001)		(0.006)		(0.007)		(0.013)	
Urban	0.000	0.000	-0.000	0.000	-0.004	-2.817	-0.002	-0.976	0.000	0.000
	(0.001)		(0.001)		(0.003)		(0.002)		(0.004)	
Province	-0.004	5.883	-0.007*	7.216	0.002	1.408	0.002	0.976	0.000	0.000
	(0.003)		(0.004)		(0.012)		(0.008)		(0.014)	
Year	0.002*	-2.941	0.001	-1.030	0.008*	5.634	0.006	2.927	-0.003	-0.929
	(0.001)		(0.001)		(0.005)		(0.004)		(0.009)	
Sample	154065		153877		148025		150673		145278	
Population	109111123		108973589		103890990		106183461		101635797	

Source: Own Calculations, Pooled GHS 2011-2017.

Note: Standard errors in parenthesis. *** significant at the 1% level, ** significant at the 5% level and * significant at the 10% level. Earnings/income values are measured in thousands of Rands per month and are inflation adjusted with 2017 as the base year. The characteristics labelled Education, Marital Status, Population Group, Province and Year represents the total effect of the group of variables that comprise it.

The wage gap experienced by people with severe disabilities is positive, indicating that people without disabilities earn more on average compared to people with severe disabilities. The endowment effect accounts for almost 60 percent of this gap in earnings and is mainly explained by differences in education. If people with disabilities had the same level of education as people without disabilities they would potentially earn more than they currently are. This same pattern is observed for people with UN and multiple disabilities as well. In the case of the UN measure, 66 percent of the gap in earnings between people with and without disabilities is explained by the endowment effect whilst for people with multiple disabilities, 70 percent of the gap is explained by the endowment effect. Once again, in terms of the endowment effect, differences in education account for the majority of the wage gap between people with and without disabilities. Another factor driving the difference in earnings is the lack of access to formal sector employment by persons with disabilities, which in each of these models (severe, UN and multiple) explains up to 30 percent of the total gap in earnings.

In each case, the coefficients effect is sizably smaller compared to the endowment effect although also positive in sign, indicating that if people with disabilities had the same returns to their characteristics as people without disabilities their earnings would increase but this effect is relatively small. The coefficient effect signals that the wage gap may be driven by a small component of discrimination based on disability. However, the endowment effect and, in some cases, the interaction effect is larger than the coefficients effect implying that it is the characteristics of people with and without disabilities that is driving the wage gap. Education appears to have the largest effect overall such that if a person with disabilities were able to attain more education, they would have better earnings outcomes than they currently do.

These results corroborate the findings of each analysis of educational attainment, labour market participation and employment. People with disabilities have fewer years of schooling overall compared to people without disabilities and are more likely to be out of the labour force or unemployed. Once employed, individuals with severe, UN and multiple disabilities earn less than those without disabilities. The key issue appears to be education. Education is a key driver of labour market outcomes in South Africa and if people with disabilities are limited in their educational attainment, this has significant consequences in the labour market.

5.5 Concluding Comments

Studies have shown that people with disabilities are disproportionately negatively affected in the labour market in terms of lower levels of employment and earnings compared to people without disabilities (Elwan, 1999; Gannon & Nolan, 2004; Mitra, 2008; Mitra, Posarac & Vick, 2011; Mizunoya & Mitra, 2013a; Barnay et al., 2015; Jones, Latreille & Sloane, 2019). Policy and legislation in South Africa are

structured to accommodate people with disabilities and aim to ensure equal access to education and employment (United Nations, 2006; Buckup, 2009; Department of Social Development, 2016). However, implementation is decidedly slow and very little work has been done to examine the relationship between disability and labour market outcomes in the country. The WG-SS, an internationally comparable, best practice survey instrument is included in the GHS alongside education and labour market indicators making it possible to establish large scale statistics for people with disabilities.

This chapter therefore seeks to answer four main research objectives, the first being to establish the relationship between disability and educational attainment. This objective is based on the widely acknowledged importance of education in the labour market, thus this particular research objective seeks to understand the extent to which adults with disabilities have acquired less education than those without disabilities. According to the results of the multivariate analysis, people with disabilities have fewer years of schooling across all measures of disability compared to people without disabilities.

People with severe versions of each disability type have attained less education than their counterparts without disabilities, with people with severe cognitive disabilities being the most disadvantaged. The analysis of educational attainment for five separate birth cohorts revealed that people with disabilities in the older cohorts have less of a difference in years of education attained compared to people with disabilities in the younger cohort. The smaller difference in the older cohorts (people born in the 1950s of 1960s) could be due to a later onset of disability as a person ages or as a result of their disabilities being easier to accommodate in schooling and as such educational attainment was not affected in childhood. However, this smaller difference is likely related to the lack of access to equitable education for the large part of the black population in South Africa, who was distortional effected by the apartheid educational policies of the time which lead to all people in this race group obtaining fewer years of schooling in the older age groups. Hence the educational gap between people with and without disabilities is smaller. The people with disabilities in the younger three cohorts (born from 1971) have significantly fewer years of schooling compared to people without disabilities. Hence, while the majority of previously disadvantaged populations experienced an increase in access to education in post-Apartheid South Africa, people with disabilities in particular those with more severe disabilities have been left behind. The findings of this analysis of overall educational attainment echo findings from chapter 4 regarding the negative relationship between disability and school attendance and progression and is consistent with literature that highlights the lack of reasonable accommodation and implementation of inclusive education in schools (Deghaye, 2021).

The second research objective seeks to understand the association between disability and labour market participation. And the third objective examines the link between disability and employment. The results reveal that people with disabilities across all measures are significantly less likely to participate in the labour market using both the expanded and official measure of labour market participation. The negative association between disability and labour market participation is largest among people with disabilities measured by the severe, UN or multiple measure. In particular, severe physical disabilities lower the probability of participation by almost 30 percentage points compared to people without disabilities. Severe cognitive, communication and self-care disabilities also have sizeable negative associations with labour market participation. The third objective was to estimate the relationship between disability and employment. The findings suggest that people with disabilities are significantly less likely to be employed once they participate in the labour market. Once again, the negative marginal effect for having a severe physical disability is the largest of all disability types, indicating that people with severe disabilities are particularly disadvantaged in terms of access to employment. Not all of the disability types are significant in the analysis of employment and this may be due to people being economically inactive. In other words, there is no further employment disadvantage among those who participate, but participation rates are much lower than for those without disabilities.

The final objective of this chapter was to estimate the relationship between disability and earnings for working age adults. This was done using both an OLS and an Oaxaca-Blinder decomposition. The OLS estimation identifies a significant negative relationship between some of the disability indicators and earnings, although not for the broad or moderate measures of disability. The Oaxaca-Blinder decomposition identifies a gap in earnings between people with and without disabilities that is largely explained by the endowment effect. That is to say that if people with disabilities had the same characteristics as people without disabilities, they would potentially earn more from employment than they currently do. A large part of the explanation for the lower earnings of people with disabilities, if they find employment, is that they have lower levels of education and less access to formal sector jobs than people without disabilities.

Education is a major driver of labour market outcomes. Throughout the analysis of disability in adulthood, the thesis shows that because people with disabilities have worse educational attainment than those without disabilities, their labour market outcomes are significantly impeded. Hence disability inclusive policy needs to drive improvement of access to quality education to ensure that people with disabilities have equal opportunities in the labour market. Even after controlling for education, people with disabilities have worse labour market outcomes compared to people without disabilities. Thus removing barriers to accessing the labour market is another crucial matter to be addressed. Options for suitable transportation as well as better guidelines and implementation of reasonable accommodation

may be necessary to assist people with disabilities in searching for work and being able to find good quality jobs. An increase in access to public services such as education, transport and health needs to specifically target people with more severe difficulties in particular those with physical and cognitive difficulties as these experience the biggest barriers to education and employment.

Chapter Six

A summary of findings and overall concluding remarks

In recent years, disability rights have become a global priority culminating in the United Nations Convention on the Rights of Persons with Disabilities (CRPD) in 2006 (United Nations, 2006). Many countries, including South Africa ratified this convention and have incorporated disability rights into their own policies. The White Paper on the Rights of Persons with Disabilities (WPRPD) published in 2016 is the first ever disability-specific policy document in South Africa and uses the CRPD as a guidepost (Department of Social Development, 2016). Some common themes in the WPRPD include the integration of people with disabilities in society and the removal of barriers to access whether it be in the form of reasonable accommodation, assistive devices or addressing negative attitudes towards people with disabilities. Education, employment and social integration are key elements that are consistently reiterated in the document (Department of Social Development, 2016).

In the past, monitoring disability prevalence and the integration of people with disabilities in education and the workplace was difficult. This was largely because data collected at the national level, such as Census and household surveys, lacked appropriate questions on disability while surveys varied greatly both within countries and between countries. In most cases, the medical model of disability formed the basis of the types of disability questions that were previously included into household surveys. The medical model views disability as an individual problem and focuses on the diagnosis alone rather than on the environment in which a person lives. As a result of the CRPD, the Washington Group on disability statistics was tasked with devising a set of questions on disability that could be used in Census and national household surveys to enable all countries to have a standardised approach to measuring disability in order to monitor progress towards the goals of the CRPD. Initially, the Washington Group devised the Short Set of questions (WG-SS) and the Extended Question Set of Functioning (WG-ES-F) and has more recently released a module on child functioning. In both the CRPD and the WPRPD, monitoring and evaluation of disability policies is crucial to ensure that the implementation is successful (United Nations, 2006; Department of Social Development, 2016). The WPRPD specifies that academic research and data analysis, both in terms of trends of prevalence and disability rights issues, are crucial to the monitoring and evaluation process. This thesis therefore undertakes such research in order to contribute to the existing South African literature on people with disabilities.

The three sets of questions devised by the Washington Group were based on the International Classification of Functioning (ICF) model, which is based on a combination of the medical and social models of disability (Washington Group on Disability Statistics, 2009). The social model of disability,

as a departure from the medical model, considers the wider environment in which a person lives. A person may have a medically diagnosed disability but be fully functional in society with the support of assistive devices and reasonable accommodation. On the other hand, a person may struggle to integrate into education or the workplace if such support is lacking. Monitoring disability rights issues using Census or household surveys requires an approach that integrates both the medical and social models. The household surveys still effectively make a distinction between people with and without disabilities; however, this is done from a functional limitation approach as compared to a medical diagnosis approach. The distinction between groups with and without disabilities assists in determining whether civil rights are being equitably acknowledged in society (Altman, 2001). Once this distinction is made, considerations around the persons' environment and the societal culture can then be examined to the extent the surveys allow.

As a response to the ratification of the CRPD and the availability of the Washington Group sets of questions, South Africa incorporated the WG-SS into the General Household Survey (GHS) in 2009 and the national Census in 2011. Since then, these questions have been a consistent feature of the GHS each year and have also been included in the Community Survey 2016 and the Demographic and Health Survey 2016. This inclusion represents considerable progress in terms of the availability of data on people with disabilities in the country. However, academic research in this area remains significantly lacking in South Africa. One study used the Census 2011 and the GHS 2013 to determine the relationship between disability and school attendance using multivariate analysis (Mizunoya & Mitra, 2013b). Other studies have used the Census 2011 and GHS 2011 to examine, using univariate analysis, school attendance, educational attainment, household income and the social protection measures for people with disabilities (Department of Social Development, 2015; Hanass-Hancock & McKenzie, 2017).

The overarching research aim of this thesis is to explore and better understand childhood and adult disability particularly as it pertains to education and labour market outcomes in South Africa. This investigation will fill the significant research gaps that exist in the South African literature both in terms of the data used and the type of analysis conducted. As mentioned, the WG-SS has until now mainly been used for univariate analysis with very limited research involving multivariate analysis. This thesis therefore serves as the first study of its kind offering comprehensive analysis of education and the labour market using both univariate and multivariate approaches to analysing South African household survey data containing the WG-SS.

The first main research objective of this thesis was to explore the relevant household surveys in South Africa that contain disability-related questions. The evolution of disability models, disability survey

questions and the consequent measures of disability, and the links between them, were comprehensively examined in chapter three. The household surveys in South Africa that collect information on disability include the Census, the GHS, the Community Survey, the Demographic and Health Survey and the National Income Dynamics Study (NIDS). The only one of these surveys that is yet to include the WG-SS is the NIDS. Questions in the NIDS survey can be combined to produce measures that are in line with the WG-SS; however, doing so is feasible only for adults and not for children. The NIDS uses problematic language (handicapped) in the response options to one of the survey questions and the scale of response varies across questions within the NIDS.

A major contribution of this thesis is that, throughout the analysis, it uses and compares numerous measures of disability. The WG advises that the questions can be used in a variety of ways by altering the cut-off points in terms of the scale of response. Field tests that have compared who is counted as having a disability based on the WG questions with people who are identified as having a disability through clinical assessments and find that moderate disabilities should not be excluded from an analysis of disability (Sprunt, McPake & Marella, 2019). The measures of disability formulated in chapter three included the basic measure, broad measure, moderate, severe, UN and multiple. The basic measure is used when a survey question is based on the medical model and frames the question around a diagnosis with a basic yes or no response option. This measure applies to the older surveys that were based on the medical model of disability and did not include the WG-SS. For all surveys with the WG-SS, a variety of measures are possible due to the manner in which the questions are structured. There are six domains of functioning in the short set and for each domain, the respondent is asked to indicate their level of difficulty. This thesis therefore uses the broad measure which includes anyone who reports any moderate or severe disabilities, as well as moderate and severe disabilities as separate categories. The UN measure refers to having two or more moderate disabilities or at least one severe disability, and lastly the multiple measure refers to more than one disability.

The prevalence of disability amongst children in the Census 2011 ranges from three percent (multiple disabilities) to four percent (severe), five percent (UN), nine percent (moderate) and 13 percent (broad). The GHS (based on the pooled sample 2011 to 2017) produces slightly lower prevalence estimates that range from two percent (multiple) to three percent (severe), four percent (UN), six percent (moderate) and nine percent (broad). The CS 2016 produces estimates that are slightly lower than the GHS for children aged seven to 15 years. For adults, the prevalence estimates are the largest in the Census 2011. Three percent of adults have disabilities according to the multiple and severe measures, five percent based on the UN measure, 12 percent have moderate disabilities and 15 percent have disabilities based on the broad measure. The GHS estimates are again somewhat lower ranging from one percent (multiple) to eight percent (broad) whereas the CS 2016 in this case produces estimates that are closer

to the Census 2011. The prevalence of disability therefore varies across surveys even when the same survey instrument and measures are being used. This result could be due to the sample that was surveyed, for example the national Census surveys the full population and is therefore more accurately representative. The Community Survey 2016 also has a very large sample size as the CS is designed to be an interim survey between Censuses while the GHS has the smallest sample size of the three.

After a thorough exploration of these surveys it was established that the most suitable dataset for use in this thesis would be the GHS. Aside from there being multiple years of the survey with the WG-SS (2009 onwards) the GHS also includes a comprehensive set of questions on education and it collects detailed employment and reliable earnings information. Whilst the prevalence estimates for adults are lower than both the Census 2011 and CS 2016, the GHS produces estimates for children that are closer to the Census 2011. Given that this thesis aimed to conduct a disaggregated analysis for a number of disability measures, it was important to have a large enough number of observations to provide robust estimates in the multivariate analysis. It is for this reason that the GHS surveys from 2011 to 2017 was pooled to form a single dataset for the analysis in chapters four and five. The NIDS adult questionnaire (which is not based on the WG questions) includes more domains of functioning such as upper body difficulties which is lacking from the WG-SS and therefore produces the largest prevalence estimates overall for adults with disabilities. However, given that the NIDS does not use the WG-SS and does not ask sufficient questions on children with disabilities, it was excluded.

It is well documented globally that children with disabilities are more likely to be out of school compared to children without disabilities (Peters, 2003, 2007; Fleisch, Shindler & Perry, 2012; Stabile & Allin, 2012; Lamichhane & Kawakatsu, 2015; Mizunoya, Mitra & Yamasaki, 2016). In South Africa, a few studies have produced similar findings regarding school attendance of children with disabilities and have also pointed to the slow implementation of policy regarding inclusive education (Sibanda, 2004b; Department of Social Development, 2015; Mizunoya, Mitra & Yamasaki, 2016; Donohue & Bornman, 2018; Deghaye, 2021). This thesis aimed (in chapter four) to extend the existing literature through two main sub-objectives: establishing the relationship between disability and school attendance, and between disability and school progression, for children of compulsory school age (seven to 15 years). The analysis of school attendance used updated data containing the WG-SS in South Africa compared to earlier research. In addition, this chapter makes a novel contribution to the literature in the form of the examination of school progression. If children with disabilities are able to access schooling, can they progress in a similar manner to their peers without disabilities?

Chapter four approaches these research objectives through both univariate and multivariate analysis. A separate model is estimated for each disability measure with an additional model that includes all six of

the disability types based on the six domains of functioning in the WG-SS. This approach aimed to ascertain whether having certain forms of disability are associated with poorer schooling outcomes more than others. The multivariate analysis included a probit estimation of the relationship between disability and a dichotomous measure of school attendance for children (seven to 15 years). The findings in chapter four suggest a strong negative relationship between disability and school attendance for all measures of disability except moderate disabilities. This finding suggests that moderate disabilities may be easier to accommodate in schooling compared to more severe disabilities. In terms of disability types, children with severe cognitive or communication difficulties are particularly disadvantaged in terms of school attendance.

School progression is measured as an ordered categorical outcome representing whether children are two or more years behind, one year behind or are in the expected grade for their age, respectively. An ordered probit model is used to estimate the relationship between school progression and disability, once again with separate models for each measure of disability. Children with disabilities are found to be significantly less likely to be in their expected grade for their age. Again, children with multiple or severe disability are the most disadvantage in terms of progression whereby they are more likely to be two or more years behind in school compared to children without disabilities. The results suggest that moderate sight and moderate physical disabilities are easier to accommodate in the school environment because children reporting these disability types are more likely to be in the expected grade for their age. The children most likely to be two or more years behind include those with severe cognitive or severe communication difficulties.

On the whole, this thesis has provided a nuanced view of how disability is associated with schooling outcomes (attendance and progression) and shown that certain disability types and severities are associated with larger negative outcomes whereas children with moderate disabilities fare similarly to children without disabilities. However, even for moderate disabilities, the extent of the association between disability and school attendance or progression depends on the disability type. For example, children with moderate cognitive or communication difficulties are significantly less likely to attend school compared to children without disabilities. Children with moderate hearing or cognitive disabilities are more likely to be behind their peers without disabilities in school. The thesis has shown that an analysis that treats children with disabilities as a homogeneous group would draw misleading conclusions about the extent of access to, and progress through, schooling. The approach of disaggregating the analysis by disability measure means that the findings assist in ascertaining where the disability education policy focus should be.

It is evident from the results of chapter four that childhood disability affects both access to schooling and progression in school. This finding indicates that children with disabilities may be unable to access schooling and if they do, they may take longer to attain the same level of education as their peers without disabilities. Worse educational outcomes in childhood may lead to worse labour market outcomes in adulthood. It is acknowledged in the literature that childhood disability may have long term economic consequences because of such difficulties in attaining education and is often why disability is associated with poverty (Filmer, 2008; Stabile & Allin, 2012; Loyalka, Liu & Chen, 2019). In adulthood, disability has been found to be negatively associated with employment and earnings (Kidd, Sloane & Ferko, 2000; Altman, 2005; Mitra, 2008; Mizunoya & Mitra, 2013a). Very few studies have examined the relationship between disability and labour market outcomes in South Africa and those that have focused on univariate analysis or were done prior to the inclusion of the WG-SS in South African surveys. As such, chapter five focused on adults of working age (16 to 59 years) to quantify the relationship between disability and educational attainment and disability and labour market outcomes such as participation, employment and earnings.

Chapter five began with an analysis of adult educational attainment. This was an important first step in the exploration of labour market outcomes because education is strongly positively associated with employment and earnings (Becker, 1962; Hinchliffe, 1987; van der Berg, 2002; Colclough, Kingdon & Patrinos, 2009). Limited studies have examined educational attainment as an outcome variable, rather choosing to use it as an explanatory variable in labour market analysis. This thesis contributes to the body of literature because estimating the association between disability and educational attainment in adulthood has not been done before in South Africa, although a number of challenges arise in conducting such estimation using cross-sectional data and the results should not be treated as causal. An OLS estimation was used to establish the relationship between disability and the total number of years of education attained, with separate models was estimated for each measure of disability. A final model included both the moderate and severe versions of all six disability types. The analysis is undertaken both for the full sample of working age adults and by birth cohort, to account for disparities in educational policies and access over time that may have made educational attainment difficult for certain groups of people compared to others irrespective of disabilities. For example, during apartheid, Africans were discriminated against and had inferior schooling systems compared to Whites.

The findings of this analysis show that people with disabilities have fewer years of schooling compared to people without disabilities. People with severe or multiple disabilities are the most disadvantaged in their educational attainment, with between two and four fewer years of schooling compared to people without disabilities. The birth cohort analysis shows that the gap in educational attainment between people with disabilities and people without disabilities is largest in the younger cohorts, specifically

those born 1981 to 1990. The gap in educational attainment between people with and without disabilities in the older cohorts (those born between 1951 and 1960 and 1961 and 1970) is smaller in comparison. This could be because at the time these individuals were acquiring education, other educational access factors including systematic racial discrimination impeded educational attainment for people without disabilities, resulting in a smaller difference in overall attainment between people with and without disabilities.

In the younger cohorts, as the apartheid regime came to an end and education reform began, the gap became wider for people with disabilities having significantly fewer years of education overall. These findings are consistent with those in chapter four in that in the case of both children and adults, people with severe or multiple disabilities are most affected in their educational attainment. In addition, out of the six disability types, people with severe communication and cognitive difficulties have fewer years of education overall compared to people without. The findings reiterate that these are the particular groups of people that require focused intervention in education. In addition, it is evident that whilst certain areas of discrimination such as gender and race have been addressed leading to more people having access to education overall, people with disabilities may to an extent remain marginalised in this area.

International research on disability and the labour market has identified that people with disabilities are more likely to be out of the labour force, less likely to be employed and more likely to earn less than people without disabilities (Kidd, Sloane & Ferko, 2000; Dustmann et al., 2003; Gannon & Nolan, 2004; Barnay et al., 2015; Jones, Latreille & Sloane, 2019). In South Africa, limited research has been done in this area, but studies that have examined employment identify low rates of employment amongst people with disabilities (Mitra, 2008; Department of Social Development, 2015). This thesis expands on the existing literature by examining three facets of labour market outcomes namely participation, employment and earnings using a range of disability measures based on the WG-SS.

In first world countries, labour market participation and employment are often treated as synonymous because overall unemployment rates are low. In South Africa, where unemployment rates are high, separate analyses for participation and employment are necessary. In this analysis, the expanded definition of participation was used which means that people are considered to participate in the labour market if they are willing and able to work and either searching or not searching for work. The reason for this definition being chosen over the official definition is because people with disabilities are more likely to have difficulties with job search activities due to a lack of reasonable accommodation and suitable transport (Hanass-Hancock et al., 2017). The relationship between disability and labour market participation is explored through with working age adults as the sample, while the disability-

employment relationship is investigated among labour market participants. Probit estimation is used for both of these dichotomous outcomes.

The results from chapter five indicate that people with disabilities are significantly less likely to participate in the labour market compared to people without disabilities and that this negative association is largest among people with severe, UN or multiple disabilities. The probability of participation for people with severe disabilities is almost 30 percentage points lower compared to people without disabilities. Specifically, severe cognitive, communication and self-care disabilities are negatively associated with labour market participation. If people with disabilities do participate in the labour market, they are also significantly less likely to be employed. In both instances of participation and employment, people with severe physical disabilities are the most disadvantaged compared to people without disabilities. However, not all of the disability types are significantly associated with employment, which may be due to people being economically inactive, as people with severe cognitive and communication are least likely to be labour market participants.

The final analysis in chapter five estimated the relationship between disability and earnings among the employed. The OLS estimation identified a significant negative relationship between disability (severe, UN and multiple) and earnings. The difference in earnings between adults with and without disabilities is substantially reduced when the additional control variables were added into the model, suggesting that people with disabilities may not have the same levels of productive characteristics as people without disabilities. However, it's also possible that people with disabilities receive lower returns on those characteristics (such as education) than people without disabilities.

The Oaxaca-Blinder decomposition was conducted to disentangle the roles of differences in characteristics between adults with and without disabilities from differences in how those characteristics are rewarded in the labour market. The analysis identified that the gap in earnings between people with and without disabilities is largely explained by the endowment effect, indicating that the mean incomes of people with disabilities would be far more similar to people without disabilities if both groups had the same characteristics. The largest contributing factors to this endowment effect are education and access to employment in the formal sector. Throughout the analysis for adults, education was a consistent positive determinant of participation, employment and earnings. Given that educational endowments also explain the wage gap between people with and without disabilities, education appears to be a major driver of labour market outcomes for people with disabilities. It is therefore problematic that people with disabilities are disadvantaged in their educational attainment both in childhood during the compulsory school-going period and in adulthood in terms of the total years of education attained.

Although the thesis makes several novel and important contributions, it is limited by the available national-level data on people with disabilities, namely, the information obtained from the disability questions as well as the other elements included in the surveys. For example, none of the surveys identified as including education, labour market and disability related questions include details on the quality of education received or the extent to which children are promoted to the next grade without passing the initial grade. The Census is a population-level survey and therefore captures information on all South Africans including more people with disabilities compared to other 'representative household surveys' such as the GHS. However, it does not include sufficient detail on education and earnings to undertake the sorts of analysis conducted in the thesis. Currently, only the WG-SS is incorporated into South African surveys which potentially limits the analysis possible for children, because the questions are designed specifically for adults (in terms of the phrasing used). In addition, for adults the short set of questions excludes certain domains of functioning such as upper body limitations and mental health difficulties. Whereas the WG-ES-F contains more detailed questions on all domains of functioning which may be necessary for a more detailed analysis of adults. Nonetheless, the analysis conducted using the WG-SS provides valuable information on people with disabilities in terms of their access to and engagement with the education system and the labour market. This thesis was therefore able to demonstrate using various measures of disability the significant negative relationship between disability and education which significantly impacts on labour market outcomes in adulthood. If more detailed sets of disability questions are incorporated into future survey instruments, for both children and adults with disabilities, further research into other domains of functioning may be able to build on the analysis undertaken in this thesis.

As part of policy implementation and evaluation, it may be necessary to include the larger survey instruments such as the WG-ES-F and the child functioning model into at least one of the South African household surveys. Having a disability-rich survey would be an asset in the monitoring and evaluation of disability policy in the country. Aside from the NIDS, which doesn't include any of the WG sets of questions, all of the household surveys with disability questions are cross-sectional in nature. Longitudinal data with internationally-comparable disability questions would be valuable in understanding individuals' trajectories through childhood and adulthood, as well as dealing with econometric issues that may confound the ability to estimate the causal effects of disability, such as the role of unobserved characteristics that are not easy to address in cross-sectional analysis.

The overall findings of this thesis emphasise the value and significance of education for people with disabilities. As a general notion, this is not a new concept, but it is the first time a comprehensive analysis has been conducted in South Africa. South Africa has existing policies that highlight these matters, yet the implementation of these policies is problematic and slow. It is therefore imperative that

policy refocuses on these matters because if people with disabilities are able to access education, they have better long-term labour market outcomes. In addition, people who acquire disabilities in adulthood may require suitable transportation options as well as better guidelines and implementation of reasonable accommodations in order to improve job search and employment opportunities. The CRPD and the WPRPD also identify transportation and reasonable accommodation as key elements that drive social inclusion but again, implementation is slow.

This thesis has been able to identify that the most vulnerable groups of people disabilities are those with severe or multiple disabilities as they are significantly impeded in regard to educational attainment and labour market outcomes. This is the first study to have disaggregated the analysis by using a variety of disability measures. The findings with regards to the different measures and types of disabilities serves as a starting point for where to focus interventions. That is not to say that people with moderate disabilities should not be included in policy because it was established that only certain moderate disability types (such as seeing, communication and sometimes moderate physical disabilities) are easier to accommodate than others depending on the circumstance.

The work of this thesis has provided a large-scale analysis using nationally representative household survey data and using these findings alongside small-scale studies based on qualitative data can further assist our understanding of the detailed, individual-specific lived experiences of people with disability. As additional years of the GHS data become available, an updated analysis would be valuable. It would be interesting to determine whether the gaps between people with and without disabilities across each of the outcomes discussed in this thesis change over time. This would be a useful undertaking in using research, guided by this thesis to monitor progress towards policy goals.

Lastly, equal opportunities in society does not mean that each opportunity is the same for each individual. Rather, it means that every individual has an opportunity to reach their full potential based on their own unique goals, strengths and weaknesses. It is up to society and policy to enhance these strengths and support the weaknesses in such a way that everyone has a chance to contribute to society. Identifying people with disabilities who have specific areas of difficulty and providing relevant interventions, such as reducing negative attitudes and providing reasonable accommodation in education and the workplace, is imperative to assist them in assimilating into society. Not only will this benefit people with disabilities in terms of their livelihoods, but it will also benefit society as a whole.

Appendix A

Appendix to Chapter Three

Table A1: Disability prevalence by age group for each year of the General Household Survey (2011 to 2017), by disability measure

	Age Group	2009	2010	2011	2012	2013	2014	2015	2016	2017
		8.1	10.4	9.2	8.8	9.2	9.7	9.8	9.3	8.6
	7 – 15	(0.3)	(0.3)	(0.3)	(0.3)	(0.4)	(0.4)	(0.4)	(0.4)	(0.4)
		[0.73]	[0.93]	[0.81]	[0.79]	[0.82]	[0.85]	[0.88]	[0.82]	[0.80]
		9.0	10.0	8.8	9.4	9.2	7.7	8.5	7.8	6.9
Broad	**16 – 59**	(0.2)	(0.1)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)
		[2.68]	[3.01]	[2.72]	[2.95]	[2.96]	[2.46]	[2.77]	[2.56]	[2.30]
		37.7	39.6	36.9	36.4	36.1	35.1	35.1	35.1	32.9
	60+	(0.7)	(0.7)	(0.9)	(0.8)	(0.8)	(0.8)	(0.8)	(0.8)	(0.8)
		[1.36]	[1.46]	[1.41]	[1.45]	[1.48]	[1.47]	[1.53]	[1.58]	[1.48]
		5.6	6.8	6.2	6.0	6.3	7.0	6.8	6.7	6.0
	7 – 15	(0.2)	(0.2)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)	(0.3)
		[0.50]	[0.61]	[0.54]	[0.54]	[0.57]	[0.61]	[0.61]	[0.59]	[0.55]
		6.4	7.3	7.0	7.3	7.3	6.1	6.7	6.1	5.5
Mod	**16 – 59**	(0.1)	(0.1)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)
		[1.91]	[2.19]	[2.15]	[2.30]	[2.34]	[1.94]	[2.18]	[2.00]	[1.83]
		23.4	26.6	25.6	25.5	25.2	24.4	24.1	24.6	22.9
	60+	(0.6)	(0.7)	(0.8)	(0.8)	(0.7)	(0.7)	(0.7)	(0.7)	(0.7)
		[0.84]	[0.98]	[0.98]	[1.01]	[1.04]	[1.02]	[1.05]	[1.11]	[1.03]
		2.5	3.6	3.0	2.8	2.8	2.7	3.0	2.6	2.7
	7 – 15	(0.1)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)
		[0.22]	[0.32]	[0.27]	[0.25]	[0.25]	[0.24]	[0.27]	[0.23]	[0.25]
		2.6	2.7	1.8	2.1	1.9	1.6	1.8	1.7	1.4
Sev	**16 – 59**	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)
		[0.77]	[0.82]	[0.56]	[0.65]	[0.62]	[0.52]	[0.59]	[0.55]	[0.47]
		14.3	13.1	11.3	10.9	10.9	10.8	11.0	10.5	10.1
	60+	(0.5)	(0.5)	(0.5)	(0.4)	(0.4)	(0.4)	(0.5)	(0.5)	(0.5)
		[0.51]	[0.48]	[0.43]	[0.43]	[0.45]	[0.45]	[0.48]	[0.47]	[0.45]
		3.2	4.6	3.6	3.6	3.8	3.8	4.1	3.6	3.5
	7 – 15	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)
		[0.30]	[0.42]	[0.33]	[0.33]	[0.35]	[0.35]	[0.38]	[0.33]	[0.33]
		3.4	3.6	2.6	2.9	3.0	2.3	2.6	2.2	1.9
UN	**16 – 59**	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)
		[1.03]	[1.10}	[0.82]	[0.93]	[0.99]	[0.75]	[0.87]	[0.76]	[0.65]
		21.8	21.0	18.2	17.8	18.6	17.7	18.2	17.1	15.8
	60+	(0.6)	(0.6)	(0.6)	(0.6)	(0.6)	(0.6)	(0.6)	(0.6)	(0.6)
		[0.79]	[0.79]	[0.71]	[0.71]	[0.77]	[0.76]	[0.81]	[0.79]	[0.73]
		1.6	2.5	1.3	1.5	1.8	1.9	2.1	1.9	1.7
	7 – 15	(0.1)	(0.1)	(0.1)	(0.1)	(0.2)	(0.2)	(0.2)	(0.2)	(0.2)
		[0.15]	[0.23]	[0.12]	[0.13]	[0.16]	[0.17]	[0.19]	[0.18]	[0.17]
		1.7	1.9	1.3	1.3	1.6	1.1	1.2	1.0	0.9
Multi	**16 – 59**	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)	(0.1)
		[0.52]	[0.60]	[0.39]	[0.43]	[0.52]	[0.36]	[0.41]	[0.35]	[0.29]
		16.5	15.9	11.7	11.1	12.0	11.4	12.1	11.4	10.1
	60+	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)	(0.5)
		[0.60]	[0.60]	[0.46]	[0.45]	[0.50]	[0.49]	[0.54]	[0.52]	[0.47]

Source: Own Calculations using GHS 2011 to 2017.

Notes: Data are weighted to represent the South African population of children aged 7 to 15 years. The figures include standard errors (round brackets) and frequencies (square brackets).

Table A2: Disability prevalence by age group for each year of the General Household Survey (2011 to 2017), by disability type

		Sight		Hearing		Physical		Cognitive		Communication		Self-Care	
		Mod	**Sev**	**Mod**	**Sev**	**Mod**	**Sev**	**Mod**	**Sev**	**Mod**	**Sev**	**Mod**	**Sev**
2009	**7 – 15**	1.9 (0.1) [0.17]	0.3 (0.0) [0.03]	1.0 (0.1) [0.09]	0.3 (0.0) [0.02]	0.3 (0.0) [0.03]	0.3 (0.0) [0.03]	1.0 (0.1) [0.09]	0.6 (0.1) [0.05]	0.4 (0.1) [0.04]	0.4 (0.1) [0.04]	2.4 (0.1) [0.22]	1.5 (0.1) [0.24]
	16 – 59	4.9 (0.1) [1.44]	1.2 (0.1) [0.36]	1.0 (0.1) [0.31]	0.3 (0.0) [0.10]	0.9 (0.0) [0.27]	0.7 (0.0) [0.22]	1.1 (0.1) [0.32]	0.6 (0.0) [0.17]	0.2 (0.0) [0.06]	0.2 (0.0) [0.07]	0.3 (0.0) [0.10]	0.3 (0.0) [0.10]
	60+	19.6 (0.6) [0.66]	6.7 (0.4) [0.24]	7.3 (0.4) [0.26]	2.3 (0.2) [0.08]	10.9 (0.4) [0.37]	6.9 (0.3) [0.25]	8.0 (0.4) [0.28]	3.1 (0.2) [0.11]	1.1 (0.1) [0.04]	0.5 (0.1) [0.02]	2.9 (0.2) [0.10]	2.4 (0.2) [0.09]
2010	**7 – 15**	2.2 (0.1) [0.20]	0.3 (0.0) [0.03]	1.1 (0.1) [0.10]	0.3 (0.1) [0.03]	0.8 (0.1) [0.07]	0.4 (0.0) [0.03]	1.6 (0.1) [0.15]	0.8 (0.1) [0.07]	1.0 (0.1) [0.08]	1.0 (0.1) [0.09]	3.3 (0.2) [0.29]	1.8 (0.1) [0.16]
	16 – 59	5.7 (0.1) [1.72]	0.9 (0.0) [0.26]	1.3 (0.1) [0.39]	0.3 (0.0) [0.09]	0.9 (0.0) [0.28]	0.7 (0.0) [0.21]	1.3 (0.1) [0.38]	0.7 (0.0) [0.22]	0.4 (0.0) [0.13]	0.6 (0.0) [0.20]	0.4 (0.0) [0.13]	0.4 (0.0) [0.11]
	60+	21.8 (0.6) [0.77]	4.8 (0.3) [0.18]	7.4 (0.3) [0.27]	2.1 (0.2) [0.08]	11.0 (0.5) [0.38]	6.8 (0.3) [0.25]	7.3 (0.3) [0.26]	2.6 (0.2) [0.10]	1.1 (0.1) [0.04]	1.1 (0.1) [0.04]	2.4 (0.2) [0.09]	2.0 (0.2) [0.07]
2011	**7 – 15**	2.1 (0.2) [0.19]	0.3 (0.0) [0.03]	1.0 (0.1) [0.09]	0.2 (0.1) [0.02]	0.3 (0.1) [0.03]	0.2 (0.0) [0.02]	1.1 (0.1) [0.10]	0.7 (0.1) [0.06]	0.5 (0.1) [0.04]	0.4 (0.1) [0.03]	3.0 (0.2) [0.26]	2.1 (0.2) [0.19]
	16 – 59	5.5 (0.2) [1.68]	0.7 (0.0) [0.20]	1.0 (0.1) [0.31]	0.2 (0.0) [0.07]	0.8 (0.1) [0.26]	0.5 (0.0) [0.16]	1.0 (0.1) [0.32]	0.5 (0.0) [0.17]	0.3 (0.0) [0.08]	0.2 (0.0) [0.06]	0.3 (0.0) [0.08]	0.3 (0.0) [0.09]
	60+	21.6 (0.8) [0.80]	4.6 (0.3) [0.18]	6.9 (0.4) [0.26]	1.8 (0.3) [0.07]	8.0 (0.4) [0.29]	5.6 (0.3) [0.22]	6.6 (0.4) [0.25]	2.2 (0.2) [0.08]	0.9 (0.1) [0.03]	0.4 (0.1) [0.01]	2.0 (0.2) [0.08]	1.9 (0.2) [0.08]
2012	**7 – 15**	2.3 (0.2) [0.21]	0.3 (0.0) [0.03]	0.9 (0.1) [0.08]	0.3 (0.0) [0.02]	0.5 (0.1) [0.04]	0.3 (0.1) [0.03]	1.2 (0.1) [0.11]	0.7 (0.1) [0.07]	0.5 (0.1) [0.05]	0.3 (0.1) [0.03]	2.7 (0.2) [0.24]	1.8 (0.2) [0.16]
	16 – 59	5.8 (0.2) [1.82]	0.7 (0.0) [0.22]	1.2 (0.1) [0.38]	0.3 (0.0) [0.10]	0.8 (0.1) [0.26]	0.5 (0.0) [0.17]	1.0 (0.1) [0.32]	0.6 (0.0) [0.19]	0.3 (0.0) [0.10]	0.2 (0.0) [0.06]	0.4 (0.1) [0.12]	0.3 (0.0) [0.09]

	60+	21.9 (0.8) [0.83]	4.7 (0.3) [0.19]	7.5 (0.4) [0.29]	1.9 (0.2) [0.07]	8.8 (0.4) [0.33]	4.9 (0.3) [0.20]	5.5 (0.3) [0.22]	1.9 (0.2) [0.08]	0.9 (0.2) [0.03]	0.3 (0.1) [0.01]	2.3 (0.2) [0.09]	1.2 (0.1) [0.05]
	7 – 15	2.3 (0.2) [0.20]	0.3 (0.1) [0.03]	1.0 (0.1) [0.09]	0.2 (0.0) [0.02]	0.7 (0.1) [0.06]	0.4 (0.1) [0.04]	1.4 (0.2) [0.13]	0.7 (0.1) [0.07]	0.6 (0.1) [0.05]	0.4 (0.1) [0.04]	3.5 (0.2) [0.31]	1.8 (0.2) [0.16]
	16 – 59	5.6 (0.2) [1.80]	0.7 (0.0) [0.22]	1.3 (0.1) [0.42]	0.3 (0.0) [0.10]	1.2 (0.1) [0.38]	0.6 (0.0) [0.17]	1.2 (0.1) [0.39]	0.5 (0.0) [0.18]	0.5 (0.1) [0.15]	0.2 (0.0) [0.06]	0.5 (0.1) [0.17]	0.3 (0.0) [0.09]
2013													
	60+	20.6 (0.7) [0.81]	5.0 (0.3) [0.21]	7.5 (0.4) [0.30]	1.7 (0.2) [0.07]	10.2 (0.5) [0.40]	4.9 (0.3) [0.20]	6.0 (0.4) [0.24]	1.8 (0.2) [0.08]	0.9 (0.2) [0.04]	0.4 (0.1) [0.02]	2.4 (0.2) [0.10]	1.3 (0.1) [0.06]
	7 – 15	1.8 (0.2) [0.16]	0.3 (0.0) [0.02]	0.7 (0.1) [0.06]	0.2 (0.0) [0.02]	0.6 (0.1) [0.05]	0.3 (0.1) [0.03]	1.6 (0.2) [0.14]	0.7 (0.1) [0.06]	0.7 (0.1) [0.06]	0.4 (0.1) [0.03]	4.3 (0.3) [0.38]	2.0 (0.1) [0.18]
	16 – 59	4.5 (0.2) [1.47]	0.5 (0.0) [0.17]	0.9 (0.1) [0.28]	0.2 (0.0) [0.07]	0.8 (0.1) [0.26]	0.4 (0.0) [0.14]	0.9 (0.1) [0.31]	0.5 (0.0) [0.16]	0.3 (0.0) [0.09]	0.2 (0.0) [0.05]	0.3 (0.0) [0.10]	0.2 (0.0) [0.08]
2014													
	60+	20.1 (0.7) [0.82]	4.1 (0.3) [0.18]	6.8 (0.4) [0.29]	1.8 (0.2) [0.08]	9.3 (0.5) [0.38]	5.3 (0.3) [0.23]	5.4 (0.4) [0.23]	2.0 (0.2) [0.08]	0.6 (0.1) [0.02]	0.4 (0.1) [0.02]	2.0 (0.2) [0.08]	1.5 (0.2) [0.07]
	7 – 15	1.8 (0.1) [0.17]	0.2 (0.0) [0.02]	0.8 (0.1) [0.07]	0.2 (0.0) [0.02]	0.7 (0.1) [0.06]	0.6 (0.1) [0.05]	1.7 (0.2) [0.15]	0.1 (0.1) [0.09]	0.6 (0.1) [0.06]	0.6 (0.1) [0.05]	4.0 (0.2) [0.36]	2.1 (0.2) [0.19]
	16 – 59	5.1 (0.2) [1.68]	0.7 (0.0) [0.22]	0.9 (0.1) [0.31]	0.2 (0.0) [0.08]	0.9 (0.1) [0.29]	0.5 (0.0) [0.17]	1.0 (0.1) [0.34]	0.5 (0.0) [0.16]	0.3 (0.0) [0.09]	0.2 (0.0) [0.05]	0.4 (0.0) [0.12]	0.2 (0.0) [0.08]
2015													
	60+	19.7 (0.7) [0.83]	4.4 (0.3) [0.19]	7.5 (0.4) [0.33]	1.4 (0.2) [0.06]	9.5 (0.4) [0.39]	5.6 (0.3) [0.25]	6.0 (0.4) [0.26]	2.7 (0.2) [0.12]	0.7 (0.1) [0.03]	0.4 (0.1) [0.02]	2.6 (0.2) [0.11]	1.7 (0.2) [0.07]
	7 – 15	1.6 (0.1) [0.15]	0.3 (0.1) [0.03]	0.7 (0.1) [0.07]	0.1 (0.0) [0.01]	0.8 (0.1) [0.08]	0.3 (0.1) [0.03]	1.5 (0.1) [0.13]	0.7 (0.1) [0.06]	0.7 (0.1) [0.06]	0.6 (0.1) [0.05]	3.9 (0.2) [0.35]	1.8 (0.2) [0.16]
	16 – 59	4.8 (0.2) [1.60]	0.6 (0.1) [0.21]	0.8 (0.1) [0.26]	0.2 (0.0) [0.06]	0.7 (0.1) [0.24]	0.5 (0.0) [0.16]	0.9 (0.1) [0.29]	0.5 (0.0) [0.16]	0.2 (0.0) [0.08]	0.2 (0.0) [0.06]	0.3 (0.0) [0.10]	0.2 (0.0) [0.08]
2016													
	60+	20.8 (0.7) [0.91]	4.2 (0.3) [0.19]	6.9 (0.4) [0.31]	2.0 (0.2) [0.09]	9.1 (0.4) [0.39]	5.5 (0.3) [0.25]	6.0 (0.4) [0.27]	1.8 (0.2) [0.08]	0.9 (0.1) [0.04]	0.5 (0.1) [0.02]	2.4 (0.2) [0.11]	1.5 (0.2) [0.07]

2017	**7 – 15**	1.7 (0.1) [0.16]	0.3 (0.1) [0.02]	0.7 (0.1) [0.06]	0.1 (0.0) [0.01]	0.5 (0.1) [0.04]	0.4 (0.1) [0.03]	1.3 (0.1) [0.12]	0.6 (0.1) [0.06]	0.5 (0.1) [0.05]	0.5 (0.1) [0.05]	3.7 (0.2) [0.34]	1.8 (0.2) [0.17]
	16 – 59	4.3 (0.2) [1.46]	0.5 (0.0) [0.17]	0.7 (0.1) [0.24]	0.2 (0.0) [0.07]	0.6 (0.0) [0.19]	0.4 (0.0) [0.14]	0.7 (0.1) [0.25]	0.3 (0.0) [0.12]	0.2 (0.0) [0.08]	0.1 (0.0) [0.05]	0.3 (0.0) [0.09]	0.2 (0.0) [0.07]
	60+	19.2 (0.7) [0.84]	4.3 (0.3) [0.19]	5.6 (0.3) [0.25]	1.7 (0.2) [0.08]	8.7 (0.4) [0.38]	4.5 (0.3) [0.21]	5.0 (0.3) [0.22]	1.9 (0.2) [0.08]	0.5 (0.1) [0.02]	0.5 (0.1) [0.02]	2.0 (0.2) [0.09]	1.3 (0.2) [0.06]

Source: Own Calculations using GHS 2011 to 2017.
Notes: Data are weighted to represent the South African population of children aged 7 to 15 years. The figures include standard errors (round brackets) and frequencies (square brackets).

Box A1: The Washington Group Extended Set of Questions

Preamble to the WG ES-F:
Text provided in [ ] may be used at the discretion of the country / survey organization.
Interviewer, read: "Now I am going to ask you some [additional] questions about your ability to do different activities, and how you have been feeling. [Although some of these questions may seem similar to ones you have already answered, it is important that we ask them all.]"

VISION

VIS_1 [Do/Does] [you/he/she] wear glasses?
1. Yes
2. No
7. Refused
9. Don't know

VIS_2 [Do/Does] [you/he/she] have difficulty seeing, [*If VIS_1 = 1:* even when wearing [your/his/her] glasses]? Would you say… [*Read response categories*]
1. No difficulty
2. Some difficulty
3. A lot of difficulty
4. Cannot do at all / Unable to do
7. Refused
9. Don't know

[*Note: This item is Question 1 in the WG Short Set.*]
OPTIONAL Vision questions:
VIS_3 [Do/does] [you/he/she] have difficulty clearly seeing someone's face across a room [*If VIS_1 = 1:* even when wearing [your/his/her] glasses]? Would you say… [*Read response categories*]
1. No difficulty
2. Some difficulty
3. A lot of difficulty
4. Cannot do at all / Unable to do
7. Refused
9. Don't know

VIS_4 [Do/does] [you/he/she] have difficulty clearly seeing the picture on a coin [*If VIS_1 = 1:* even when wearing [your/his/her] glasses]? Would you say… [*Read response categories*]?
1. No difficulty
2. Some difficulty
3. A lot of difficulty
4. Cannot do at all / Unable to do
7. Refused
9. Don't know

[*Note*: *Countries may choose to replace "the picture of a coin" with an equivalent item.]*

HEARING

HEAR_1 [Do/Does] [you/he/she] use a hearing aid?
1. Yes
2. No
7. Refused
9. Don't know

EAR_2 [Do/Does] [you/he/she] have difficulty hearing, [*If HEAR_1 = 1:* even when using a hearing aid(s)]? Would you say… [*Read response categories*]
1. No difficulty
2. Some difficulty
3. A lot of difficulty
4. Cannot do at all / Unable to do
7. Refused
9. Don't know

[*Note: This item is Question 2 in the WG Short Set.*]

OPTIONAL Hearing questions:

HEAR_3 How often [do/does] [you/he/she] use [your/his/her] hearing aid(s)? Would you say… [*Read response categories*]

1. All of the time
2. Some of the time
3. Rarely
4. Never
7. Refused
9. Don't know

HEAR_4 [Do/does] [you/he/she] have difficulty hearing what is said in a conversation with one other person in a quiet room [*If HEAR_1 = 1:* even when using [your/his/her] hearing aid(s)]? Would you say… [*Read response categories*]

1. No difficulty
2. Some difficulty
3. A lot of difficulty
4. Cannot do at all / Unable to do
7. Refused
9. Don't know

HEAR_5 [Do/does] [you/he/she] have difficulty hearing what is said in a conversation with one other person in a noisier room [*If HEAR_1 = 1:* even when using [your/his/her] hearing aid(s)]? Would you say… [*Read response categories*]

1. No difficulty
2. Some difficulty
3. A lot of difficulty
4. Cannot do at all / Unable to do
7. Refused
9. Don't know

MOBILITY

MOB_1 [Do/Does] [you/he/she] have difficulty walking or climbing steps? Would you say… [*Read response categories*]

1. No difficulty
2. Some difficulty
3. A lot of difficulty
4. Cannot do at all / Unable to do
7. Refused
9. Don't know

[*Note: This item is Question 3 in the WG Short Set.*]

MOB_2 [Do/does] [you/he/she] use any equipment or receive help for getting around?

1. Yes
2. No (*Skip to MOB_4.*)
7. Refused (*Skip to MOB_4.*)
9. Don't know (*Skip to MOB_4.*)

MOB_3 [Do/does] [you/he/she] use any of the following?

Interviewer: Read the following list and record all affirmative responses: 1. Yes	2. No	*7. Refused*	*9 Don't Know*
A.		Cane or walking stick?	
B.		Walker or Zimmer frame?	
C.		Crutches?	

D.	Wheelchair or scooter?
E.	Artificial limb (leg/foot)?
F.	Someone's assistance?
G.	Other (please specify):

MOB_4 [Do/Does] [you/he/she] have difficulty walking 100 meters on level ground, that would be about the length of one football field or one city block [*If MOB_2 = 1:* without the use of [your/his/her] aid]? Would you say… [*Read response categories*]

1. No difficulty
2. Some difficulty
3. A lot of difficulty
4. Cannot do at all / Unable to do *(Skip to MOB_6.)*
7. Refused
9. Don't know

[*Note: Allow national equivalents for 100 metres.*]

MOB_5 [Do/Does] [you/he/she] have difficulty walking half a km on level ground, that would be the length of five football fields or five city blocks [*If MOB_2 = 1:* without the use of [your/his/her] aid]? Would you say… [*Read response categories*]

1. No difficulty
2. Some difficulty
3. A lot of difficulty
4. Cannot do at all / Unable to do
7. Refused
9. Don't know

[*Note: Allow national equivalents for 500 metres.*]

MOB_6 [Do/Does] [you/he/she] have difficulty walking up or down 12 steps? Would you say… [*Read response categories*]

1. No difficulty
2. Some difficulty
3. A lot of difficulty
4. Cannot do at all / Unable to do
7. Refused
9. Don't know

If MOB_2 = 2 "No", skip to next section.
If MOB_3 = D "Wheelchair", skip to next section.

MOB_7 [Do/Does] [you/he/she] have difficulty walking 100 meters on level ground, that would be about the length of one football field or one city block, when using [your/his/her] aid? Would you say… [*Read response categories*]

1. No difficulty
2. Some difficulty
3. A lot of difficulty
4. Cannot do at all / Unable to do *(skip MOB_8)*
7. Refused
9. Don't know

MOB_8 [Do/Does] [you/he/she] have difficulty walking half a km on level ground, that would be the length of five football fields or five city blocks, when using [your/his/her] aid? Would you say… [*Read response categories*]

1. No difficulty
2. Some difficulty
3. A lot of difficulty
4. Cannot do at all / Unable to do
7. Refused
9. Don't know

COMMUNICATION

COM_1 Using [your/his/her] usual language, [do/does] [you/he/she] have difficulty communicating, for example understanding or being understood? Would you say… [*Read response categories*]

1. No difficulty
2. Some difficulty
3. A lot of difficulty
4. Cannot do at all / Unable to do
7. Refused
9. Don't know

[*Note: This item is Question 6 in the WG Short Set.*]

COM_2 [Do/does] [you/he/she] use sign language?

1. Yes
2. No
7. Refused
9. Don't know

COGNITION (REMEMBERING)

COG_1 [Do/does] [you/he/she] have difficulty remembering or concentrating? Would you say… [*Read response categories*]

1. No difficulty
2. Some difficulty
3. A lot of difficulty
4. Cannot do at all / Unable to do
7. Refused
9. Don't know

[*Note: This item is Question 4 in the WG Short Set.*]

OPTIONAL Cognition questions:
COG_2 [Do/does] [you/he/she] have difficulty remembering, concentrating, or both? Would you say… [*Read response categories*]

1. Difficulty remembering only
2. Difficulty concentrating only (*skip to next section)*
3. Difficulty with both remembering and concentrating
7. Refused
9. Don't know

COG_3 How often [do/does] [you/he/she] have difficulty remembering? Would you say… [*Read response categories*]

1. Sometimes
2. Often
3. All of the time
7. Refused
9. Don't know

COG_4 [Do/does] [you/he/she] have difficulty remembering a few things, a lot of things, or almost everything? Would you say… [*Read response categories*]

1. A few things
2. A lot of things
3. Almost everything
7. Refused
9. Don't know

SELF-CARE

SC_1 [Do/does] [you/he/she] have difficulty with self care, such as washing all over or dressing? Would you say… [*Read response categories*]

1. No difficulty
2. Some difficulty
3. A lot of difficulty
4. Cannot do at all / Unable to do

7. Refused
9. Don't know

[*Note: This item is Question 5 in the WG Short Set.*]

UPPER BODY

UB_1 [Do/Does] [you/he/she] have difficulty raising a 2 liter bottle of water or soda from waist to eye level? Would you say… [*Read response categories*]

1. No difficulty
2. Some difficulty
3. A lot of difficulty
4. Cannot do at all / Unable to do
7. Refused
9. Don't know

UB_2 [Do/Does] [you/he/she] have difficulty using [your/his/her] hands and fingers, such as picking up small objects, for example, a button or pencil, or opening or closing containers or bottles? Would you say… [*Read response categories*]

1. No difficulty
2. Some difficulty
3. A lot of difficulty
4. Cannot do at all / Unable to do
7. Refused
9. Don't know

AFFECT
(ANXIETY AND DEPRESSION)

Proxy respondents may be omitted from this section, at country's discretion.
Interviewer: If respondent asks whether they are to answer about their emotional states after taking mood-regulating medications, say: "Please answer according to whatever medication [you were/he was/she was] taking."

ANX_1 How often [do/does] [you/he/she] feel worried, nervous or anxious? Would you say… [*Read response categories*]

1. Daily
2. Weekly
3. Monthly
4. A few times a year
5. Never
7. Refused
9. Don't know

ANX_2 [Do/Does] [you/he/she] take medication for these feelings?

1. Yes
2. No (*If "Never" to ANX_1 and "No" to ANX_2, skip to DEP_1.)*
7. Refused
9. Don't know

ANX_3 Thinking about the last time [you/he/she] felt worried, nervous or anxious, how would [you/he/she] describe the level of these feelings? Would [you/he/she] say… [*Read response categories*]

1. A little
2. A lot
3. Somewhere in between a little and a lot
7. Refused
9. Don't know

1 How often [do/does] [you/he/she] feel depressed? Would [you/he/she] say… [*Read response categories*]

1. Daily
2. Weekly
3. Monthly
4. A few times a year

5. Never
7. Refused
9. Don't know

DEP_2 [Do/Does] [you/he/she] take medication for depression?
1. Yes
2. No (*If "Never" to DEP_1 and "No" to DEP_2, skip to next section.)*
7. Refused
9. Don't know

DEP_3 Thinking about the last time [you/he/she] felt depressed, how depressed did [you/he/she] feel? Would you say… [*Read response categories*]
1. A little
2. A lot
3. Somewhere in between a little and a lot
7. Refused
9. Don't know

PAIN

Proxy respondents may be omitted from this section, at country's discretion.
Interviewer: If respondent asks whether they are to answer about their pain when taking their medications, say: "Please answer according to whatever medication [you were/he was/she was] taking."

PAIN_1 In the past 3 months, how often did [you/he/she] have pain? Would you say… [*Read response categories*]
1. Never (*If "Never" to PAIN_1, skip to next section.)*
2. Some days
3. Most days
4. Every day
7. Refused
9. Don't know

PAIN_2 Thinking about the last time [you/he/she] had pain, how much pain did [you/he/she] have? Would you say… [*Read response categories*]
1. A little
2. A lot
3. Somewhere in between a little and a lot
7. Refused
9. Don't know

FATIGUE

Proxy respondents may be omitted from this section, at country's discretion.
TIRED_1 In the past 3 months, how often did [you/he/she] feel very tired or exhausted? Would you say… [*Read response categories*]
1. Never (*If "Never" to TIRED_1, skip to next section.)*
2. Some days
3. Most days
4. Every day
7. Refused
9. Don't know

TIRED_2 Thinking about the last time [you/he/she] felt very tired or exhausted, how long did it last? Would you say… [*Read response categories*]
1. Some of the day
2. Most of the day
3. All of the day
7. Refused
9. Don't know

TIRED_3 Thinking about the last time [you/he/she] felt this way, how would you describe the level of tiredness? Would you say… [*Read response categories*]

1. A little
2. A lot
3. Somewhere in between a little and a lot

7. Refused

9. Don't know

Source: Washington Group on Disability Statistics

Appendix B

Appendix to Chapter 4

Table B1: Reasons not attending school, full set of responses

	All	Broad	Moderate	Severe	UN	Multiple
Disability	0.225	0.638	0.227	0.724	0.702	0.778
	(0.017)	(0.031)	(0.061)	(0.030)	(0.030)	(0.029)
Too old/young	0.035	0.037	0.113	0.021	0.020	0.007
	(0.006)	(0.011)	(0.049)	(0.008)	(0.008)	(0.005)
Has completed education/ satisfied with level of education/ do not want to study	0.049	0.001	0.000	0.002	0.002	0.000
	(0.009)	(0.001)	(0.000)	(0.002)	(0.002)	(0.000)
School/education institution is too far	0.009	0.000	0.000	0.000	0.000	0.000
	(0.003)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Difficulties to get to school (transport)	0.003*	0.004	0.022	0.000	0.000	0.000
	(0.002)	(0.004)	(0.022)	(0.000)	(0.000)	(0.000)
No money for fees	0.098	0.015	0.019	0.014	0.016	0.013
	(0.011)	(0.006)	(0.013)	(0.006)	(0.006)	(0.006)
He or she is working at home or business/job	0.025	0.001	0.000	0.001	0.001	0.000
	(0.006)	(0.001)	(0.000)	(0.001)	(0.001)	(0.000)
Do not have time/too busy	0.004	0.000	0.000	0.000	0.000	0.000
	(0.002)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Family commitment (e.g. child minding)	0.028	0.016	0.081	0.002	0.002	0.000
	(0.006)	(0.009)	(0.051)	(0.002)	(0.002)	(0.000)
Education is useless or not interesting	0.097	0.003	0.000	0.004	0.004	0.000
	(0.013)	(0.003)	(0.000)	(0.004)	(0.004)	(0.000)
Unable to perform at school	0.066	0.040	0.075	0.032	0.033	0.026
	(0.009)	(0.013)	(0.036)	(0.014)	(0.013)	(0.014)
Illness	0.083	0.143	0.183	0.134	0.144	0.131
	(0.009)	(0.020)	(0.052)	(0.021)	(0.021)	(0.022)
Pregnancy	0.021	0.000	0.000	0.000	0.000	0.000
	(0.004)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Failed exams	0.025	0.004	0.000	0.005	0.005	0.000
	(0.005)	(0.003)	(0.000)	(0.004)	(0.003)	(0.000)
Got married	0.000	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Violence in school	0.007	0.000	0.000	0.000	0.000	0.000
	(0.002)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Not accepted for enrolment	0.067	0.033	0.093	0.020	0.027	0.012
	(0.010)	(0.013)	(0.044)	(0.011)	(0.012)	(0.008)
Other	0.158	0.065	0.187	0.040	0.045	0.033
	(0.014)	(0.015)	(0.055)	(0.013)	(0.013)	(0.013)
Sample	1209	379	64	315	338	265
Population	716252	215517	36954	178563	190493	153789

Source: Own Calculations, Pooled GHS 2011-2017.

Table B2: The probability of school attendance for children 7 to 15 years by disability measure, displaying coefficients

	Broad			Moderate			Severe			UN			Multiple		
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
Disability	-	-	-	-0.025	-0.028	-0.024	-	-	-	-	-	-	-	-	-
	0.552***	0.558***	0.554***				1.045***	1.051***	1.049***	0.891***	0.896***	0.894***	1.166***	1.171***	1.159***
	(0.033)	(0.033)	(0.033)	(0.040)	(0.040)	(0.040)	(0.045)	(0.045)	(0.045)	(0.042)	(0.042)	(0.041)	(0.053)	(0.053)	(0.052)
Age	0.363***	0.362***	0.370***	0.432***	0.431***	0.439***	0.365***	0.364***	0.371***	0.355***	0.354***	0.361***	0.389***	0.388***	0.396***
	(0.038)	(0.038)	(0.038)	(0.036)	(0.037)	(0.037)	(0.038)	(0.038)	(0.038)	(0.037)	(0.037)	(0.037)	(0.036)	(0.037)	(0.037)
Age Squared	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	0.018***	0.018***	0.018***	0.020***	0.020***	0.021***	0.018***	0.018***	0.018***	0.017***	0.017***	0.018***	0.019***	0.019***	0.019***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
African		0.059	0.165**		0.053	0.173***		0.069	0.164**		0.069	0.163**		0.058	0.153**
		(0.063)	(0.067)		(0.062)	(0.067)		(0.063)	(0.068)		(0.062)	(0.066)		(0.061)	(0.067)
Coloured		-0.114	-0.044		-0.093	-0.020		-0.106	-0.055		-0.094	-0.022		-0.101	-0.025
		(0.071)	(0.075)		(0.070)	(0.074)		(0.072)	(0.075)		(0.070)	(0.074)		(0.070)	(0.075)
Indian		0.111	0.160		0.123	0.172		0.126	0.171		0.134	0.187*		0.112	0.164
		(0.112)	(0.113)		(0.112)	(0.114)		(0.111)	(0.113)		(0.109)	(0.110)		(0.112)	(0.114)
Male		-0.034	-0.029		-0.042**	-0.037*		-0.031	-0.026		-0.028	-0.024		-0.030	-0.026
		(0.021)	(0.021)		(0.021)	(0.021)		(0.021)	(0.021)		(0.020)	(0.020)		(0.020)	(0.020)
Urban			-0.066**			-0.074**			-0.067**			-0.074**			-0.078**
			(0.033)			(0.033)			(0.033)			(0.032)			(0.032)
Mother's education:															
Missing education			-0.025			-0.059			-0.002			0.003			-0.020
			(0.121)			(0.119)			(0.127)			(0.123)			(0.120)
No School			0.131**			0.114*			0.135**			0.134**			0.141**
			(0.061)			(0.060)			(0.061)			(0.059)			(0.059)
Primary education			0.294***			0.274***			0.293***			0.289***			0.299***
			(0.058)			(0.058)			(0.059)			(0.056)			(0.057)
Secondary education			0.358***			0.347***			0.359***			0.350***			0.362***
			(0.065)			(0.064)			(0.065)			(0.063)			(0.063)
Matric			0.333***			0.309***			0.332***			0.333***			0.344***
			(0.072)			(0.072)			(0.072)			(0.069)			(0.069)
Mother part of household			-			-			-			-0.140**			-
			0.155***			0.150***			0.151***						0.147***
			(0.058)			(0.057)			(0.059)			(0.056)			(0.057)
Number of children <15 years			0.056***			0.063***			0.050***			0.052***			0.049***
			(0.014)			(0.014)			(0.015)			(0.014)			(0.014)
Number of adults (16-59 years)			-0.007			-0.004			-0.007			-0.012			-0.012
			(0.008)			(0.008)			(0.008)			(0.008)			(0.008)
Number of older adults 60+			0.087***			0.115***			0.067**			0.063**			0.057**
			(0.029)			(0.029)			(0.029)			(0.029)			(0.029)
Western Cape			0.141**			0.157***			0.158***			0.132**			0.119**
			(0.055)			(0.055)			(0.056)			(0.055)			(0.054)

Eastern Cape			0.197***			0.189***			0.201***			0.225***			0.234***
			(0.048)			(0.047)			(0.048)			(0.047)			(0.048)
Northern Cape			0.337***			0.299***			0.373***			0.339***			0.285***
			(0.059)			(0.059)			(0.060)			(0.059)			(0.059)
Free State			0.175***			0.162***			0.182***			0.186***			0.165***
			(0.052)			(0.051)			(0.051)			(0.049)			(0.049)
KwaZulu-Natal			0.120***			0.124***			0.127***			0.127***			0.116***
			(0.043)			(0.042)			(0.043)			(0.041)			(0.042)
North West			0.075			0.042			0.088			0.096*			0.066
			(0.058)			(0.057)			(0.059)			(0.058)			(0.058)
Mpumalanga			0.281***			0.263***			0.292***			0.286***			0.249***
			(0.054)			(0.053)			(0.055)			(0.054)			(0.053)
Limpopo			0.189***			0.160***			0.194***			0.195***			0.166***
			(0.058)			(0.057)			(0.059)			(0.058)			(0.057)
Earnings from employment			0.001			0.002			0.002			0.002			0.002
			(0.002)			(0.002)			(0.002)			(0.002)			(0.002)
Earnings from employment squared			0.000			0.000			0.000			0.000			0.000
			(0.000)			(0.000)			(0.000)			(0.000)			(0.000)
Other income			-			-			-			-			-
			0.000***			0.000***			0.000***			0.000***			0.000***
			(0.000)			(0.000)			(0.000)			(0.000)			(0.000)
Grant income			-			-			-			-			-
			0.066***			0.083***			0.051***			0.047***			0.043***
			(0.014)			(0.014)			(0.015)			(0.014)			(0.014)
2012			0.053			0.053			0.054			0.050			0.052
			(0.048)			(0.047)			(0.049)			(0.048)			(0.047)
2013			0.001			-0.003			-0.000			0.025			0.034
			(0.047)			(0.046)			(0.048)			(0.047)			(0.047)
2014			-0.067			-0.068			-0.076			-0.052			-0.042
			(0.047)			(0.046)			(0.048)			(0.046)			(0.046)
2015			-0.019			-0.028			-0.021			-0.007			0.004
			(0.046)			(0.045)			(0.047)			(0.045)			(0.045)
2016			-0.007			-0.010			-0.010			0.001			0.014
			(0.047)			(0.046)			(0.048)			(0.047)			(0.047)
2017			-0.021			-0.017			-0.024			-0.017			-0.003
			(0.047)			(0.046)			(0.048)			(0.047)			(0.047)
Constant	0.305	0.286	-0.083	-0.208	-0.220	-0.591***	0.289	0.259	-0.100	0.327*	0.295	-0.079	0.104	0.082	-0.283
	(0.202)	(0.213)	(0.221)	(0.193)	(0.204)	(0.213)	(0.203)	(0.214)	(0.223)	(0.198)	(0.209)	(0.217)	(0.194)	(0.205)	(0.213)
F-statistic	163	71	19	61	27	11	256	111	27	228	99	25	235	102	26
Prob < F	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sample	102693	102693	102693	102693	102693	102693	102551	102551	102551	105169	105169	105169	105169	105169	105169
Population	62710704	62710704	62710704	62710704	62710704	62710704	62618361	62618361	62618361	64289113	64289113	64289113	64289113	64289113	64289113

Source: Own Calculations, Pooled GHS 2011-2017. Note: This table presents the probit model coefficients. ** significant at the 5% level and * significant at the 10% level. Earnings/income values are measured in thousands of Rands per month and are inflation adjusted with 2017 as the base year.

Table B3: The probability of school attendance for children 7 to 15 years by disability measure, displaying marginal effects

	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
Disability	-0.038***	-0.038***	-0.038***	-0.002	-0.002	-0.002	-0.071***	-0.072***	-0.071***	-0.062***	-0.062***	-0.061***	-0.079***	-0.079***	-0.077***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.005)	(0.005)	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)	(0.005)	(0.005)
Age	0.025***	0.025***	0.025***	0.028***	0.028***	0.029***	0.025***	0.025***	0.025***	0.025***	0.025***	0.025***	0.026***	0.026***	0.026***
	(0.002)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.001)
Age Squared	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
African		0.004	0.011**		0.004	0.012**		0.005	0.011**		0.005	0.011**		0.004	0.010**
		(0.004)	(0.005)		(0.004)	(0.005)		(0.004)	(0.005)		(0.004)	(0.005)		(0.004)	(0.005)
Coloured		-0.008	-0.003		-0.006	-0.001		-0.007	-0.004		-0.007	-0.001		-0.007	-0.002
		(0.005)	(0.005)		(0.005)	(0.005)		(0.005)	(0.005)		(0.005)	(0.005)		(0.005)	(0.005)
Indian		0.007	0.011		0.008	0.011		0.008	0.011		0.009	0.012*		0.007	0.011
		(0.007)	(0.007)		(0.007)	(0.007)		(0.007)	(0.007)		(0.007)	(0.007)		(0.007)	(0.007)
Male		-0.002	-0.002		-0.003**	-0.002*		-0.002	-0.002		-0.002	-0.002		-0.002	-0.002
		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)		(0.001)	(0.001)
Urban			-0.005**			-0.005**			-0.005**			-0.005**			-0.005**
			(0.002)			(0.002)			(0.002)			(0.002)			(0.002)
Mother's education:															
Missing education			-0.002			-0.004			-0.000			0.000			-0.001
			(0.008)			(0.008)			(0.009)			(0.008)			(0.008)
No School			0.009**			0.007*			0.009**			0.009**			0.009**
			(0.004)			(0.004)			(0.004)			(0.004)			(0.004)
Primary education			0.020***			0.017***			0.019***			0.019***			0.019***
			(0.004)			(0.004)			(0.004)			(0.004)			(0.004)
Secondary education			0.023***			0.022***			0.023***			0.023***			0.023***
			(0.004)			(0.004)			(0.004)			(0.004)			(0.004)
Matric			0.021***			0.019***			0.021***			0.022***			0.022***
			(0.004)			(0.004)			(0.004)			(0.004)			(0.004)
Mother part of household			-0.010***			-0.010***			-0.010***			-0.009**			-0.010***
			(0.004)			(0.004)			(0.004)			(0.004)			(0.004)
Number of children <15 years			0.004***			0.004***			0.003***			0.004***			0.003***
			(0.001)			(0.001)			(0.001)			(0.001)			(0.001)
Number of adults (16-59 years)			-0.000			-0.000			-0.000			-0.001			-0.001
			(0.001)			(0.001)			(0.001)			(0.001)			(0.001)
Number of older adults 60+			0.006***			0.007***			0.005**			0.004**			0.004**
			(0.002)			(0.002)			(0.002)			(0.002)			(0.002)
Western Cape			0.009**			0.010***			0.010***			0.009**			0.008**
			(0.004)			(0.003)			(0.004)			(0.004)			(0.003)
Eastern Cape			0.013***			0.012***			0.013***			0.015***			0.015***
			(0.003)			(0.003)			(0.003)			(0.003)			(0.003)
Northern Cape			0.021***			0.018***			0.023***			0.022***			0.018***

			(0.004)			(0.003)			(0.004)			(0.004)			(0.004)
Free State			0.012***			0.010***			0.012***			0.012***			0.011***
			(0.003)			(0.003)			(0.003)			(0.003)			(0.003)
KwaZulu-Natal			0.008***			0.008***			0.008***			0.009***			0.008***
			(0.003)			(0.003)			(0.003)			(0.003)			(0.003)
North West			0.005			0.003			0.006			0.006*			0.004
			(0.004)			(0.004)			(0.004)			(0.004)			(0.004)
Mpumalanga			0.018***			0.016***			0.019***			0.019***			0.016***
			(0.003)			(0.003)			(0.003)			(0.003)			(0.003)
Limpopo			0.012***			0.010***			0.013***			0.013***			0.011***
			(0.004)			(0.003)			(0.004)			(0.004)			(0.004)
Earnings from employment			0.000			0.000			0.000			0.000			0.000
			(0.000)			(0.000)			(0.000)			(0.000)			(0.000)
Earnings from employment squared			0.000			0.000			0.000			0.000			0.000
			(0.000)			(0.000)			(0.000)			(0.000)			(0.000)
Other income			-0.000***			-0.000***			-0.000***			-0.000***			-0.000***
			(0.000)			(0.000)			(0.000)			(0.000)			(0.000)
Grant income			-0.004***			-0.005***			-0.003***			-0.003***			-0.003***
			(0.001)			(0.001)			(0.001)			(0.001)			(0.001)
2012			0.004			0.003			0.004			0.003			0.003
			(0.003)			(0.003)			(0.003)			(0.003)			(0.003)
2013			0.000			-0.000			-0.000			0.002			0.002
			(0.003)			(0.003)			(0.003)			(0.003)			(0.003)
2014			-0.005			-0.004			-0.005			-0.004			-0.003
			(0.003)			(0.003)			(0.003)			(0.003)			(0.003)
2015			-0.001			-0.002			-0.001			-0.000			0.000
			(0.003)			(0.003)			(0.003)			(0.003)			(0.003)
2016			-0.000			-0.001			-0.001			0.000			0.001
			(0.003)			(0.003)			(0.003)			(0.003)			(0.003)
2017			-0.001			-0.001			-0.002			-0.001			-0.000
			(0.003)			(0.003)			(0.003)			(0.003)			(0.003)
F-statistic	163	71	19	61	27	11	256	111	27	228	99	25	235	102	26
Prob < F	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sample	102693	102693	102693	102693	102693	102693	102551	102551	102551	105169	105169	105169	105169	105169	105169
Population	62710704	62710704	62710704	62710704	62710704	62710704	62618361	62618361	62618361	64289113	64289113	64289113	64289113	64289113	64289113

Table B4: The probability of school attendance for children 7 to 15 years by disability type, displaying coefficients and marginal effects

	Coefficients			Marginal Effects		
	I	**II**	**III**	**I**	**II**	**III**
Sight (Moderate)	0.044	0.042	0.045	0.003	0.003	0.003
	(0.079)	(0.079)	(0.080)	(0.005)	(0.005)	(0.005)
Sight (Severe)	-0.332**	-0.328**	-0.347**	-0.022**	-0.022**	-0.023**
	(0.160)	(0.162)	(0.168)	(0.010)	(0.011)	(0.011)
Hearing (Moderate)	-0.041	-0.049	-0.039	-0.003	-0.003	-0.003
	(0.099)	(0.100)	(0.102)	(0.007)	(0.007)	(0.007)
Hearing (Severe)	-0.320*	-0.325*	-0.318*	-0.021*	-0.021*	-0.021*
	(0.164)	(0.166)	(0.169)	(0.011)	(0.011)	(0.011)
Physical (Moderate)	0.066	0.061	0.029	0.004	0.004	0.002
	(0.145)	(0.145)	(0.147)	(0.010)	(0.010)	(0.010)
Physical (Severe)	-0.509***	-0.504***	-0.511***	-0.033***	-0.033***	-0.033***
	(0.137)	(0.138)	(0.136)	(0.009)	(0.009)	(0.009)
Communication (Moderate)	-0.447***	-0.454***	-0.441***	-0.029***	-0.030***	-0.029***
	(0.118)	(0.118)	(0.120)	(0.008)	(0.008)	(0.008)
Communication (Severe)	-0.862***	-0.866***	-0.852***	-0.056***	-0.057***	-0.055***
	(0.121)	(0.120)	(0.121)	(0.008)	(0.008)	(0.008)
Cognitive (Moderate)	-0.259***	-0.247***	-0.234***	-0.017***	-0.016***	-0.015***
	(0.086)	(0.086)	(0.086)	(0.006)	(0.006)	(0.006)
Cognitive (Severe)	-1.059***	-1.054***	-1.038***	-0.069***	-0.069***	-0.067***
	(0.091)	(0.090)	(0.092)	(0.007)	(0.007)	(0.007)
Self-Care (Moderate)	0.038	0.030	0.031	0.002	0.002	0.002
	(0.060)	(0.060)	(0.059)	(0.004)	(0.004)	(0.004)
Self-Care (Severe)	-0.272***	-0.282***	-0.289***	-0.018***	-0.019***	-0.019***
	(0.067)	(0.068)	(0.068)	(0.005)	(0.005)	(0.005)
Age	0.401***	0.400***	0.403***	0.026***	0.026***	0.026***
	(0.038)	(0.038)	(0.039)	(0.002)	(0.002)	(0.002)
Age Squared	-0.019***	-0.019***	-0.019***	-0.001***	-0.001***	-0.001***
	(0.002)	(0.002)	(0.002)	(0.000)	(0.000)	(0.000)
African		0.059	0.141**		0.004	0.009**
		(0.063)	(0.068)		(0.004)	(0.004)
Coloured		-0.115	-0.071		-0.008	-0.005
		(0.072)	(0.076)		(0.005)	(0.005)
Indian		0.093	0.136		0.006	0.009
		(0.113)	(0.115)		(0.007)	(0.007)
Male		-0.025	-0.020		-0.002	-0.001
		(0.021)	(0.021)		(0.001)	(0.001)
Urban			-0.074**			-0.005**
			(0.033)			(0.002)
Mother's education:						
Missing education			-0.019			-0.001
			(0.126)			(0.008)
No School			0.142**			0.009**
			(0.062)			(0.004)
Primary education			0.302***			0.020***
			(0.059)			(0.004)
Secondary education			0.373***			0.024***
			(0.066)			(0.004)
Matric			0.352***			0.023***
			(0.072)			(0.005)
Mother part of household			-0.150**			-0.010**
			(0.059)			(0.004)
Number of children <15 years			0.035**			0.002**
			(0.015)			(0.001)

Number of adults (16-59 years)			-0.007			-0.000
			(0.009)			(0.001)
Number of older adults 60+			0.024			0.002
			(0.030)			(0.002)
Western Cape			0.134**			0.009**
			(0.056)			(0.004)
Eastern Cape			0.212***			0.014***
			(0.050)			(0.003)
Northern Cape			0.288***			0.019***
			(0.060)			(0.004)
Free State			0.150***			0.010***
			(0.051)			(0.003)
KwaZulu-Natal			0.101**			0.007**
			(0.043)			(0.003)
North West			0.056			0.004
			(0.059)			(0.004)
Mpumalanga			0.238***			0.015***
			(0.054)			(0.004)
Limpopo			0.144**			0.009**
			(0.060)			(0.004)
Earnings from employment			0.001			0.000
			(0.002)			(0.000)
Earnings from employment squared			0.000			0.000
			(0.000)			(0.000)
Other income			-0.000***			-0.000***
			(0.000)			(0.000)
Grant income			-0.022			-0.001
			(0.015)			(0.001)
2012			0.060			0.004
			(0.049)			(0.003)
2013			0.011			0.001
			(0.048)			(0.003)
2014			-0.064			-0.004
			(0.048)			(0.003)
2015			0.006			0.000
			(0.047)			(0.003)
2016			0.006			0.000
			(0.049)			(0.003)
2017			-0.009			-0.001
			(0.048)			(0.003)
Constant	0.075	0.056	-0.261	-	-	-
	(0.206)	(0.216)	(0.225)	-	-	-
F-statistic	62	48	22	62	48	22
Prob < F	0	0	0	0	0	0
Sample	102425	102425	102425	102425	102425	102425
Population	62550249	62550249	62550249	62550249	62550249	62550249

Source: Own Calculations, Pooled GHS 2011-2017. Note: This table presents the probit model coefficients and marginal effects. *** significant at the 1% level, ** significant at the 5% level and * significant at the 10% level. Earnings/income values are measured in thousands of Rands per month and are inflation adjusted with 2017 as the base year.

Table B5: Ordered probit model for school progression for children 7 to 15 years (showing coefficients) by disability measure

	Broad	Moderate	Severe	UN	Multiple
Disability	-0.373***	-0.126***	-0.774***	-0.661***	-0.872***
	(0.022)	(0.024)	(0.038)	(0.034)	(0.049)
Age	-0.432***	-0.389***	-0.439***	-0.433***	-0.411***
	(0.024)	(0.024)	(0.024)	(0.024)	(0.023)
Age Squared	0.013***	0.011***	0.013***	0.013***	0.012***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
African	-0.001	0.004	-0.000	0.005	0.001
	(0.053)	(0.053)	(0.053)	(0.052)	(0.052)
Coloured	0.050	0.060	0.052	0.059	0.057
	(0.060)	(0.060)	(0.061)	(0.059)	(0.059)
Indian	0.193**	0.203**	0.201**	0.171*	0.164*
	(0.099)	(0.098)	(0.099)	(0.097)	(0.096)
Male	-0.320***	-0.320***	-0.320***	-0.317***	-0.318***
	(0.013)	(0.013)	(0.013)	(0.013)	(0.013)
Urban	0.068***	0.064***	0.068***	0.072***	0.070***
	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)
Mother's education:					
Missing education	0.137	0.127	0.144	0.146	0.136
	(0.091)	(0.090)	(0.093)	(0.091)	(0.090)
No School	0.052	0.048	0.049	0.044	0.047
	(0.037)	(0.037)	(0.037)	(0.037)	(0.037)
Primary education	0.332***	0.326***	0.328***	0.319***	0.322***
	(0.035)	(0.035)	(0.035)	(0.035)	(0.035)
Secondary education	0.537***	0.533***	0.533***	0.521***	0.525***
	(0.039)	(0.039)	(0.039)	(0.040)	(0.040)
Matric	0.599***	0.593***	0.595***	0.590***	0.595***
	(0.048)	(0.048)	(0.049)	(0.048)	(0.048)
Mother part of household	-0.154***	-0.152***	-0.149***	-0.141***	-0.144***
	(0.035)	(0.035)	(0.035)	(0.035)	(0.035)
Number of children <15 years	-0.017***	-0.014**	-0.019***	-0.018***	-0.019***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Number of adults (16-59 years)	-0.009**	-0.009*	-0.010**	-0.010**	-0.010**
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Number of older adults 60+	0.087***	0.095***	0.082***	0.082***	0.081***
	(0.018)	(0.018)	(0.018)	(0.017)	(0.017)
Western Cape	-0.122***	-0.113***	-0.116***	-0.113***	-0.117***
	(0.039)	(0.039)	(0.039)	(0.038)	(0.038)
Eastern Cape	-0.306***	-0.304***	-0.305***	-0.288***	-0.286***
	(0.031)	(0.031)	(0.031)	(0.030)	(0.030)
Northern Cape	-0.089**	-0.103***	-0.086**	-0.093**	-0.115***
	(0.039)	(0.038)	(0.039)	(0.038)	(0.038)
Free State	-0.135***	-0.139***	-0.133***	-0.125***	-0.135***
	(0.036)	(0.036)	(0.036)	(0.035)	(0.035)
KwaZulu-Natal	-0.027	-0.025	-0.023	-0.020	-0.025
	(0.030)	(0.030)	(0.030)	(0.030)	(0.030)
North West	-0.102***	-0.114***	-0.100***	-0.091**	-0.105***
	(0.037)	(0.037)	(0.037)	(0.036)	(0.037)
Mpumalanga	-0.081**	-0.086***	-0.078**	-0.070**	-0.085***
	(0.032)	(0.032)	(0.033)	(0.032)	(0.032)
Limpopo	0.098***	0.090***	0.100***	0.104***	0.092***
	(0.035)	(0.034)	(0.035)	(0.034)	(0.034)
Earnings from employment	0.004***	0.004***	0.004***	0.004***	0.004***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Earnings from employment squared	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***

	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Other income	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Grant income	-0.044***	-0.049***	-0.040***	-0.038***	-0.037***
	(0.009)	(0.009)	(0.009)	(0.008)	(0.008)
2012	-0.011	-0.010	-0.011	-0.002	-0.001
	(0.023)	(0.022)	(0.023)	(0.023)	(0.023)
2013	0.044*	0.043*	0.043*	0.058**	0.061***
	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)
2014	0.007	0.007	0.002	0.019	0.024
	(0.024)	(0.023)	(0.024)	(0.023)	(0.023)
2015	0.009	0.009	0.007	0.019	0.023
	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)
2016	0.053**	0.054**	0.050**	0.069***	0.075***
	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)
2017	0.069***	0.073***	0.069***	0.075***	0.082***
	(0.023)	(0.023)	(0.024)	(0.024)	(0.024)
/cut1	-4.745***	-4.435***	-4.769***	-4.701***	-4.565***
	(0.147)	(0.146)	(0.148)	(0.147)	(0.144)
/cut2	-4.106***	-3.800***	-4.128***	-4.065***	-3.930***
	(0.146)	(0.144)	(0.147)	(0.145)	(0.143)
F-statistic	130	122	132	133	133
Prob < F	0	0	0	0	0
Sample	94261	94261	94132	96535	96535
Population	57473697	57473697	57390723	58917502	58917502

Source: Own Calculations, Pooled GHS 2011-2017.
Note: This table presents the coefficients from the ordered probit model. *** significant at the 1% level, ** significant at the 5% level and * significant at the 10% level. Earnings/income values are measured in thousands of Rands per month and are inflation adjusted with 2017 as the base year.

Table B6: Ordered probit model for school progression for children 7 to 15 years (showing coefficients) by disability type

	Coefficients
Sight (Moderate)	0.118**
	(0.047)
Sight (Severe)	0.083
	(0.100)
Hearing (Moderate)	-0.224***
	(0.057)
Hearing (Severe)	-0.370***
	(0.138)
Physical (Moderate)	0.255**
	(0.111)
Physical (Severe)	-0.448***
	(0.129)
Communication (Moderate)	-0.136
	(0.105)
Communication (Severe)	-0.616***
	(0.115)
Cognitive (Moderate)	-0.455***
	(0.055)
Cognitive (Severe)	-1.061***
	(0.089)
Self-Care (Moderate)	-0.067*
	(0.039)
Self-Care (Severe)	-0.268***

	(0.048)
Age	-0.447***
	(0.025)
Age Squared	0.013***
	(0.001)
African	-0.017
	(0.053)
Coloured	0.040
	(0.061)
Indian	0.177*
	(0.099)
Male	-0.319***
	(0.013)
Urban	0.072***
	(0.020)
Mother's education:	
Missing education	0.131
	(0.092)
No School	0.053
	(0.037)
Primary education	0.328***
	(0.035)
Secondary education	0.534***
	(0.039)
Matric	0.599***
	(0.049)
Mother part of household	-0.148***
	(0.035)
Number of children <15 years	-0.024***
	(0.006)
Number of adults (16-59 years)	-0.010**
	(0.005)
Number of older adults 60+	0.067***
	(0.018)
Western Cape	-0.129***
	(0.039)
Eastern Cape	-0.301***
	(0.031)
Northern Cape	-0.113***
	(0.039)
Free State	-0.147***
	(0.036)
KwaZulu-Natal	-0.031
	(0.030)
North West	-0.095**
	(0.038)
Mpumalanga	-0.096***
	(0.032)
Limpopo	0.086**
	(0.035)
Earnings from employment	0.004***
	(0.001)
Earnings from employment squared	-0.000***
	(0.000)
Other income	0.000
	(0.000)
Grant income	-0.030***
	(0.009)
2012	-0.009

	(0.023)
2013	0.047**
	(0.023)
2014	0.007
	(0.024)
2015	0.017
	(0.023)
2016	0.058**
	(0.023)
2017	0.075***
	(0.024)
/cut1	-4.854***
	(0.151)
/cut2	-4.207***
	(0.149)
F-statistic	106
Prob < F	0
Sample	94016
Population	57326788

Source: Own Calculations, Pooled GHS 2011-2017.
Note: This table presents the coefficients from the ordered probit model. *** significant at the 1% level, ** significant at the 5% level and * significant at the 10% level. Earnings/income values are measured in thousands of Rands per month and are inflation adjusted with 2017 as the base year

Box B1: Child Functioning Module, children 2 to 4 years of age

CHILD FUNCTIONING (age 2-4)			**CF**
CF1. I would like to ask you some questions about difficulties your child may have.			
Does (*name*) wear glasses?	Yes No	1 2	 2⇨CF3
CF2. When wearing his/her glasses, does (*name*) have difficulty seeing?			
Would you say (*name*) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?	No difficulty Some difficulty A lot of difficulty Cannot do at all	1 2 3 4	1⇨CF4 2⇨CF4 3⇨CF4 4⇨CF4
CF3. Does (*name*) have difficulty seeing?			
Would you say (*name*) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?	No difficulty Some difficulty A lot of difficulty Cannot do at all	1 2 3 4	
CF4. Does (*name*) use a hearing aid?	Yes No	1 2	 2⇨CF6
CF5. When using his/her hearing aid, does (*name*) have difficulty hearing sounds like peoples' voices or music?			
Would you say (*name*) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?	No difficulty Some difficulty A lot of difficulty Cannot do at all	1 2 3 4	1⇨CF7 2⇨CF7 3⇨CF7 4⇨CF7
CF6. Does (*name*) have difficulty hearing sounds like peoples' voices or music?			
Would you say (*name*) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?	No difficulty Some difficulty A lot of difficulty Cannot do at all	1 2 3 4	

CF7. Does (*name*) use any equipment or receive assistance for walking?	Yes No	1 2	 2⇨CF10
CF8. without his/her equipment or assistance, does (*name*) have difficulty walking? Would you say (*name*) has: some difficulty, a lot of difficulty or cannot do at all?	Some difficulty A lot of difficulty Cannot do at all	2 3 4	
CF9. With his/her equipment or assistance, does (*name*) have difficulty walking? Would you say (*name*) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?	No difficulty Some difficulty A lot of difficulty Cannot do at all	1 2 3 4	1⇨CF11 2⇨CF11 3⇨CF11 4⇨CF11
CF10. Compared with children of the same age, does (*name*) have difficulty walking? Would you say (*name*) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?	No difficulty Some difficulty A lot of difficulty Cannot do at all	1 2 3 4	
CF11. Compared with children of the same age, does (*name*) have difficulty picking up small objects with his/her hand? Would you say (*name*) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?	No difficulty Some difficulty A lot of difficulty Cannot do at all	1 2 3 4	
CF12. Does (*name*) have difficulty understanding you? Would you say (*name*) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?	No difficulty Some difficulty A lot of difficulty Cannot do at all	1 2 3 4	
CF13. When (*name*) speaks, do you have difficulty understanding him/her? Would you say you have: no difficulty, some difficulty, a lot of difficulty or cannot do at all?	No difficulty Some difficulty A lot of difficulty Cannot do at all	1 2 3 4	
CF14. Compared with children of the same age, does (*name*) have difficulty learning things? Would you say (*name*) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?	No difficulty Some difficulty A lot of difficulty Cannot do at all	1 2 3 4	
CF15. Compared with children of the same age, does (*name*) have difficulty playing? Would you say (*name*) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?	No difficulty Some difficulty A lot of difficulty Cannot do at all	1 2 3 4	
CF16. Compared with children of the same age, how much does (*name*) kick, bite or hit other children or adults? Would you say: not at all, the same or less, more or a lot more?	Not at all The same or less More A lot more	1 2 3 4	

Source: Washington Group on Disability Statistics

Box B2: Child Functioning Module, children 5 to 17 years of age

CHILD FUNCTIONING (age 5-17) CF			
CF1. I would like to ask you some questions about difficulties your child may have.			
Does (*name*) wear glasses or contact lenses?	Yes	1	
	No	2	2⇨CF3
CF2. When wearing his/her glasses or contact lenses, does (*name*) have difficulty seeing?			
Would you say (*name*) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?	No difficulty	1	1⇨CF4
	Some difficulty	2	2⇨CF4
	A lot of difficulty	3	3⇨CF4
	Cannot do at all	4	4⇨CF4
CF3. Does (*name*) have difficulty seeing?			
Would you say (*name*) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?	No difficulty	1	
	Some difficulty	2	
	A lot of difficulty	3	
	Cannot do at all	4	
CF4. Does (*name*) use a hearing aid?	Yes	1	
	No	2	2⇨CF6
CF5. When using his/her hearing aid, does (*name*) have difficulty hearing sounds like peoples' voices or music?			
Would you say (*name*) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?	No difficulty	1	1⇨CF7
	Some difficulty	2	2⇨CF7
	A lot of difficulty	3	3⇨CF7
	Cannot do at all	4	4⇨CF7
CF6. Does (*name*) have difficulty hearing sounds like peoples' voices or music?			
Would you say (*name*) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?	No difficulty	1	
	Some difficulty	2	
	A lot of difficulty	3	
	Cannot do at all	4	
CF7. Does (*name*) use any equipment or receive assistance for walking?	Yes	1	
	No	2	2⇨CF12
CF8. Without his/her equipment or assistance, does (*name*) have difficulty walking 100 yards/meters on level ground? That would be about the length of 1 football field. [Or insert country specific example].			
Would you say (*name*) has: some difficulty, a lot of difficulty or cannot do at all?	Some difficulty	2	
	A lot of difficulty	3	3⇨CF10
	Cannot do at all	4	4⇨CF10
CF9. Without his/her equipment or assistance, does (*name*) have difficulty walking 500 yards/meters on level ground? That would be about the length of 5 football fields. [Or insert country specific example].			
Would you say (*name*) has: some difficulty, a lot of difficulty or cannot do at all?	Some difficulty	2	
	A lot of difficulty	3	
	Cannot do at all	4	
CF10. With his/her equipment or assistance, does (*name*) have difficulty walking 100 yards/meters on level ground? That would be about the length of 1 football field. [Or insert country specific example].			
Would you say (*name*) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?	No difficulty	1	
	Some difficulty	2	
	A lot of difficulty	3	3⇨CF14
	Cannot do at all	4	4⇨CF14

CF11. With his/her equipment or assistance, does (*name*) have difficulty walking 500 yards/meters on level ground? That would be about the length of 5 football fields. [Or insert country specific example].			
Would you say (*name*) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?	No difficulty	1	1⇨CF14
	Some difficulty	2	2⇨CF14
	A lot of difficulty	3	3⇨CF14
	Cannot do at all	4	4⇨CF14
CF12. Compared with children of the same age, does (*name*) have difficulty walking 100 yards/meters on level ground? That would be about the length of 1 football field. [Or insert country specific example].			
Would you say (*name*) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?	No difficulty	1	
	Some difficulty	2	
	A lot of difficulty	3	3⇨CF14
	Cannot do at all	4	4⇨CF14
CF13. Compared with children of the same age, does (*name*) have difficulty walking 500 yards/meters on level ground? That would be about the length of 5 football fields. [Or insert country specific example].			
Would you say (*name*) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?	No difficulty	1	
	Some difficulty	2	
	A lot of difficulty	3	
	Cannot do at all	4	
CF14. Does (*name*) have difficulty with self-care such as feeding or dressing him/herself?			
Would you say (*name*) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?	No difficulty	1	
	Some difficulty	2	
	A lot of difficulty	3	
	Cannot do at all	4	
CF15. When (*name*) speaks, does he/she have difficulty being understood by people inside of this household?			
Would you say (*name*) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?	No difficulty	1	
	Some difficulty	2	
	A lot of difficulty	3	
	Cannot do at all	4	
CF16. When (*name*) speaks, does he/she have difficulty being understood by people outside of this household?			
Would you say (*name*) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?	No difficulty	1	
	Some difficulty	2	
	A lot of difficulty	3	
	Cannot do at all	4	
CF17. Compared with children of the same age, does (*name*) have difficulty learning things?			
Would you say (*name*) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?	No difficulty	1	
	Some difficulty	2	
	A lot of difficulty	3	
	Cannot do at all	4	
CF18. Compared with children of the same age, does (*name*) have difficulty remembering things?			
Would you say (*name*) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?	No difficulty	1	
	Some difficulty	2	
	A lot of difficulty	3	

	Cannot do at all	4
CF19. Does (*name*) have difficulty concentrating on an activity that he/she enjoys doing?		
Would you say (*name*) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?	No difficulty	1
	Some difficulty	2
	A lot of difficulty	3
	Cannot do at all	4
CF20. Does (*name*) have difficulty accepting changes in his/her routine?		
	No difficulty	1
Would you say (*name*) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?	Some difficulty	2
	A lot of difficulty	3
	Cannot do at all	4
CF21. Compared with children of the same age, does (*name*) have difficulty controlling his/her behaviour?		
Would you say (*name*) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?	No difficulty	1
	Some difficulty	2
	A lot of difficulty	3
	Cannot do at all	4
CF22. Does (*name*) have difficulty making friends?		
Would you say (*name*) has: no difficulty, some difficulty, a lot of difficulty or cannot do at all?	No difficulty	1
	Some difficulty	2
	A lot of difficulty	3
	Cannot do at all	4
CF23. How often does (*name*) seem very anxious, nervous or worried?	Daily	1
	Weekly	2
	Monthly	3
Would you say: daily, weekly, monthly, a few times a year or never?	A few times a year	4
	Never	5
CF24. How often does (*name*) seem very sad or depressed?	Daily	1
	Weekly	2
Would you say: daily, weekly, monthly, a few times a year or never?	Monthly	3
	A few times a year	4
	Never	5

Source: Washington Group on Disability Statistics

Appendix C

Appendix to Chapter Five

Table C1: An OLS estimation of the association between disability and educational attainment for adults of working age, by birth cohort (broad measure)

		Birth Cohorts				
		1	2	3	4	5
	All Adults (Working Age)	1951 to 1960	1961 to 1970	1971 to 1980	1981 to 1990	1991 to 2000
Disability (Broad)	-0.598***	-0.327***	-0.391***	-0.584***	-0.674***	-0.781***
	(0.037)	(0.063)	(0.060)	(0.073)	(0.074)	(0.070)
Age	0.298***	-0.349	0.017	0.103	0.071	1.927***
	(0.005)	(0.228)	(0.156)	(0.092)	(0.047)	(0.051)
Age Squared	-0.005***	0.002	-0.002	-0.003**	-0.002*	-0.041***
	(0.000)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)
African	-2.695***	-5.095***	-3.650***	-2.406***	-1.858***	-1.132***
	(0.048)	(0.099)	(0.075)	(0.073)	(0.070)	(0.055)
Coloured	-2.627***	-4.302***	-3.260***	-2.411***	-2.021***	-1.097***
	(0.060)	(0.134)	(0.103)	(0.091)	(0.088)	(0.067)
Indian	-1.044***	-2.343***	-1.252***	-0.694***	-0.513***	-0.108
	(0.078)	(0.165)	(0.144)	(0.115)	(0.121)	(0.088)
Female	0.217***	-0.375***	-0.188***	0.231***	0.407***	0.500***
	(0.014)	(0.052)	(0.041)	(0.033)	(0.024)	(0.020)
Urban	1.283***	2.336***	2.285***	1.602***	0.955***	0.554***
	(0.038)	(0.105)	(0.084)	(0.065)	(0.044)	(0.034)
Western Cape	-0.437***	-0.384***	-0.539***	-0.482***	-0.348***	-0.425***
	(0.049)	(0.122)	(0.091)	(0.083)	(0.065)	(0.051)
Eastern Cape	-0.749***	-0.146	-0.320***	-0.857***	-0.887***	-0.905***
	(0.051)	(0.135)	(0.104)	(0.083)	(0.065)	(0.046)
Northern Cape	-1.215***	-1.842***	-1.717***	-1.499***	-0.826***	-0.822***
	(0.077)	(0.193)	(0.159)	(0.140)	(0.088)	(0.066)
Free State	-0.692***	-1.305***	-0.763***	-0.668***	-0.540***	-0.573***
	(0.057)	(0.179)	(0.112)	(0.092)	(0.067)	(0.053)
KwaZulu-Natal	-0.388***	-0.863***	-0.764***	-0.548***	-0.200***	-0.233***
	(0.046)	(0.127)	(0.101)	(0.081)	(0.053)	(0.041)
North West	-0.664***	-0.691***	-0.597***	-0.754***	-0.504***	-0.599***
	(0.065)	(0.155)	(0.130)	(0.115)	(0.076)	(0.060)
Mpumalanga	-0.353***	-1.379***	-0.494***	-0.239**	-0.192**	-0.365***
	(0.074)	(0.174)	(0.153)	(0.107)	(0.080)	(0.061)
Limpopo	-0.135**	-0.565***	0.489***	0.006	-0.214***	-0.422***
	(0.060)	(0.173)	(0.139)	(0.105)	(0.072)	(0.049)
2012	0.117***	0.284***	0.241***	0.105	0.087*	0.004
	(0.041)	(0.092)	(0.083)	(0.069)	(0.049)	(0.036)
2013	0.199***	0.325***	0.418***	0.202***	0.167***	0.042
	(0.043)	(0.108)	(0.083)	(0.070)	(0.053)	(0.037)
2014	0.309***	0.569***	0.643***	0.274***	0.252***	0.084**
	(0.041)	(0.102)	(0.087)	(0.071)	(0.051)	(0.036)
2015	0.394***	0.698***	0.814***	0.458***	0.234***	0.153***
	(0.035)	(0.102)	(0.084)	(0.064)	(0.050)	(0.034)
2016	0.464***	0.830***	0.928***	0.534***	0.328***	0.200***
	(0.035)	(0.107)	(0.088)	(0.067)	(0.050)	(0.034)
2017	0.541***	0.967***	1.059***	0.656***	0.408***	0.264***

	(0.036)	(0.113)	(0.094)	(0.070)	(0.053)	(0.036)
Constant	7.868***	25.275***	14.502***	11.351***	11.112***	-10.791***
	(0.099)	(6.585)	(3.711)	(1.732)	(0.644)	(0.517)
R-squared	0.202	0.347	0.229	0.140	0.105	0.226
F-statistic	725	376	266	157	128	512
Prob < F	0	0	0	0	0	0
Sample	331300	42118	57029	68628	93341	82578
Population	221245077	23734412	35080277	50714517	64683965	54125230

Source: Own Calculations, Pooled GHS 2011-2017.
Note: Standard errors in parenthesis. *** significant at the 1% level, ** significant at the 5% level and * significant at the 10% level.

Table C2: An OLS estimation of the association between disability and educational attainment for adults of working age, by birth cohort (moderate measure)

		Birth Cohorts				
		1	**2**	**3**	**4**	**5**
	All Adults (Working Age)	**1951 to 1960**	**1961 to 1970**	**1971 to 1980**	**1981 to 1990**	**1991 to 2000**
Disability (Moderate)	-0.142***	-0.110	-0.077	-0.097	-0.021	-0.204***
	(0.036)	(0.067)	(0.062)	(0.072)	(0.062)	(0.053)
Age	0.301***	-0.357	-0.005	0.109	0.072	1.931***
	(0.005)	(0.229)	(0.156)	(0.092)	(0.047)	(0.051)
Age Squared	-0.005***	0.002	-0.002	-0.003**	-0.002*	-0.041***
	(0.000)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)
African	-2.694***	-5.108***	-3.652***	-2.403***	-1.843***	-1.119***
	(0.049)	(0.099)	(0.075)	(0.074)	(0.070)	(0.055)
Coloured	-2.622***	-4.305***	-3.254***	-2.406***	-2.006***	-1.084***
	(0.060)	(0.134)	(0.104)	(0.091)	(0.088)	(0.067)
Indian	-1.036***	-2.333***	-1.246***	-0.694***	-0.490***	-0.095
	(0.078)	(0.166)	(0.144)	(0.114)	(0.121)	(0.088)
Female	0.210***	-0.383***	-0.197***	0.224***	0.402***	0.495***
	(0.014)	(0.052)	(0.041)	(0.033)	(0.024)	(0.020)
Urban	1.285***	2.335***	2.289***	1.607***	0.958***	0.553***
	(0.038)	(0.105)	(0.084)	(0.065)	(0.044)	(0.034)
Western Cape	-0.429***	-0.383***	-0.531***	-0.476***	-0.337***	-0.410***
	(0.049)	(0.122)	(0.091)	(0.083)	(0.065)	(0.051)
Eastern Cape	-0.749***	-0.148	-0.319***	-0.861***	-0.886***	-0.896***
	(0.051)	(0.135)	(0.104)	(0.083)	(0.065)	(0.046)
Northern Cape	-1.229***	-1.865***	-1.737***	-1.517***	-0.828***	-0.820***
	(0.077)	(0.193)	(0.159)	(0.140)	(0.088)	(0.066)
Free State	-0.712***	-1.323***	-0.786***	-0.691***	-0.559***	-0.583***
	(0.057)	(0.180)	(0.112)	(0.092)	(0.067)	(0.053)
KwaZulu-Natal	-0.379***	-0.859***	-0.754***	-0.543***	-0.185***	-0.220***
	(0.046)	(0.127)	(0.101)	(0.081)	(0.054)	(0.041)
North West	-0.674***	-0.702***	-0.608***	-0.768***	-0.511***	-0.604***
	(0.065)	(0.156)	(0.130)	(0.116)	(0.077)	(0.060)
Mpumalanga	-0.356***	-1.381***	-0.498***	-0.245**	-0.189**	-0.362***
	(0.074)	(0.173)	(0.154)	(0.106)	(0.080)	(0.061)
Limpopo	-0.122**	-0.541***	0.510***	0.014	-0.203***	-0.406***
	(0.060)	(0.173)	(0.139)	(0.105)	(0.072)	(0.050)
2012	0.115***	0.282***	0.243***	0.101	0.083*	-0.001
	(0.041)	(0.093)	(0.083)	(0.069)	(0.049)	(0.036)
2013	0.197***	0.327***	0.421***	0.197***	0.164***	0.037
	(0.043)	(0.108)	(0.083)	(0.070)	(0.053)	(0.037)
2014	0.314***	0.578***	0.657***	0.278***	0.252***	0.085**

	(0.041)	(0.102)	(0.087)	(0.071)	(0.051)	(0.036)
2015	0.395***	0.703***	0.821***	0.458***	0.232***	0.152***
	(0.035)	(0.102)	(0.085)	(0.064)	(0.050)	(0.034)
2016	0.470***	0.840***	0.940***	0.535***	0.332***	0.202***
	(0.035)	(0.107)	(0.088)	(0.067)	(0.050)	(0.034)
2017	0.550***	0.979***	1.076***	0.662***	0.414***	0.271***
	(0.036)	(0.113)	(0.094)	(0.070)	(0.053)	(0.036)
Constant	7.800***	25.526***	15.046***	11.228***	11.052***	-10.873***
	(0.100)	(6.592)	(3.713)	(1.732)	(0.644)	(0.518)
R-squared	0.199	0.346	0.227	0.138	0.102	0.221
F-statistic	708	375	263	154	124	503
Prob < F	0	0	0	0	0	0
Sample	331300	42118	57029	68628	93341	82578
Population	221245077	23734412	35080277	50714517	64683965	54125230

Source: Own Calculations, Pooled GHS 2011-2017.
Note: Standard errors in parenthesis. *** significant at the 1% level, ** significant at the 5% level and * significant at the 10% level.

Table C3: An OLS estimation of the association between disability and educational attainment for adults of working age, by birth cohort (severe measure)

		Birth Cohorts				
		1	**2**	**3**	**4**	**5**
	All Adults (Working Age)	**1951 to 1960**	**1961 to 1970**	**1971 to 1980**	**1981 to 1990**	**1991 to 2000**
Disability (Severe)	-2.110***	-0.871***	-1.460***	-2.200***	-2.947***	-2.829***
	(0.083)	(0.110)	(0.129)	(0.180)	(0.202)	(0.206)
Age	0.299***	-0.355	0.016	0.111	0.070	1.933***
	(0.005)	(0.229)	(0.156)	(0.092)	(0.046)	(0.051)
Age Squared	-0.005***	0.002	-0.002	-0.003**	-0.002*	-0.041***
	(0.000)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)
African	-2.678***	-5.089***	-3.632***	-2.400***	-1.840***	-1.124***
	(0.048)	(0.099)	(0.075)	(0.073)	(0.070)	(0.054)
Coloured	-2.607***	-4.285***	-3.246***	-2.403***	-1.992***	-1.087***
	(0.060)	(0.134)	(0.103)	(0.091)	(0.087)	(0.067)
Indian	-1.030***	-2.338***	-1.232***	-0.698***	-0.494***	-0.104
	(0.078)	(0.166)	(0.144)	(0.117)	(0.121)	(0.087)
Female	0.205***	-0.388***	-0.202***	0.215***	0.397***	0.493***
	(0.014)	(0.052)	(0.041)	(0.032)	(0.024)	(0.019)
Urban	1.272***	2.326***	2.276***	1.588***	0.940***	0.548***
	(0.038)	(0.105)	(0.084)	(0.064)	(0.044)	(0.034)
Western Cape	-0.406***	-0.350***	-0.497***	-0.460***	-0.322***	-0.402***
	(0.049)	(0.122)	(0.091)	(0.083)	(0.065)	(0.051)
Eastern Cape	-0.731***	-0.142	-0.297***	-0.841***	-0.865***	-0.888***
	(0.050)	(0.135)	(0.104)	(0.083)	(0.064)	(0.046)
Northern Cape	-1.207***	-1.833***	-1.704***	-1.500***	-0.818***	-0.808***
	(0.077)	(0.194)	(0.158)	(0.139)	(0.088)	(0.066)
Free State	-0.693***	-1.307***	-0.759***	-0.668***	-0.539***	-0.573***
	(0.057)	(0.179)	(0.112)	(0.092)	(0.066)	(0.053)
KwaZulu-Natal	-0.370***	-0.849***	-0.742***	-0.531***	-0.186***	-0.216***
	(0.046)	(0.127)	(0.102)	(0.080)	(0.053)	(0.041)
North West	-0.649***	-0.661***	-0.566***	-0.743***	-0.508***	-0.594***
	(0.064)	(0.155)	(0.129)	(0.115)	(0.076)	(0.060)
Mpumalanga	-0.339***	-1.376***	-0.477***	-0.225**	-0.175**	-0.348***
	(0.073)	(0.172)	(0.153)	(0.106)	(0.080)	(0.061)
Limpopo	-0.126**	-0.553***	0.501***	0.012	-0.207***	-0.412***
	(0.059)	(0.173)	(0.139)	(0.105)	(0.071)	(0.049)

2012	0.117***	0.285***	0.238***	0.107	0.088*	0.004
	(0.041)	(0.093)	(0.083)	(0.069)	(0.048)	(0.036)
2013	0.198***	0.329***	0.421***	0.196***	0.163***	0.037
	(0.043)	(0.108)	(0.083)	(0.070)	(0.052)	(0.037)
2014	0.308***	0.570***	0.645***	0.273***	0.245***	0.084**
	(0.041)	(0.102)	(0.087)	(0.071)	(0.051)	(0.035)
2015	0.395***	0.710***	0.817***	0.453***	0.236***	0.148***
	(0.035)	(0.102)	(0.084)	(0.063)	(0.049)	(0.033)
2016	0.466***	0.843***	0.937***	0.529***	0.328***	0.193***
	(0.035)	(0.107)	(0.088)	(0.067)	(0.050)	(0.034)
2017	0.543***	0.978***	1.064***	0.651***	0.406***	0.261***
	(0.035)	(0.113)	(0.094)	(0.070)	(0.053)	(0.036)
Constant	7.824***	25.432***	14.534***	11.187***	11.103***	-10.864***
	(0.099)	(6.596)	(3.709)	(1.724)	(0.639)	(0.511)
R-squared	0.206	0.348	0.231	0.145	0.115	0.235
F-statistic	743	377	271	165	135	522
Prob < F	0	0	0	0	0	0
Sample	330823	41943	56886	68534	93253	82531
Population	220922382	23638816	34984827	50641527	64613128	54095455

Source: Own Calculations, Pooled GHS 2011-2017.
Note: Standard errors in parenthesis. *** significant at the 1% level, ** significant at the 5% level and * significant at the 10% level.

Table C4: An OLS estimation of the association between disability and educational attainment for adults of working age, by birth cohort (UN measure)

		Birth Cohorts				
		1	**2**	**3**	**4**	**5**
	All Adults (Working Age)	**1951 to 1960**	**1961 to 1970**	**1971 to 1980**	**1981 to 1990**	**1991 to 2000**
Disability (UN)	-1.928***	-0.957***	-1.381***	-2.004***	-2.677***	-2.406***
	(0.068)	(0.090)	(0.104)	(0.147)	(0.169)	(0.167)
Age	0.297***	-0.371	0.030	0.084	0.066	1.921***
	(0.005)	(0.227)	(0.155)	(0.091)	(0.046)	(0.050)
Age Squared	-0.005***	0.002	-0.002	-0.002*	-0.001*	-0.041***
	(0.000)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)
African	-2.665***	-5.078***	-3.616***	-2.384***	-1.846***	-1.118***
	(0.048)	(0.099)	(0.074)	(0.073)	(0.069)	(0.054)
Coloured	-2.600***	-4.273***	-3.243***	-2.404***	-1.992***	-1.082***
	(0.060)	(0.132)	(0.102)	(0.091)	(0.086)	(0.066)
Indian	-1.021***	-2.325***	-1.237***	-0.684***	-0.490***	-0.103
	(0.078)	(0.162)	(0.147)	(0.116)	(0.121)	(0.088)
Female	0.205***	-0.372***	-0.201***	0.209***	0.394***	0.492***
	(0.014)	(0.052)	(0.041)	(0.032)	(0.024)	(0.019)
Urban	1.271***	2.332***	2.281***	1.591***	0.936***	0.543***
	(0.038)	(0.104)	(0.084)	(0.064)	(0.044)	(0.033)
Western Cape	-0.404***	-0.345***	-0.488***	-0.447***	-0.336***	-0.396***
	(0.048)	(0.120)	(0.090)	(0.082)	(0.065)	(0.051)
Eastern Cape	-0.726***	-0.127	-0.290***	-0.825***	-0.868***	-0.886***
	(0.050)	(0.134)	(0.102)	(0.082)	(0.063)	(0.045)
Northern Cape	-1.203***	-1.809***	-1.707***	-1.475***	-0.830***	-0.808***
	(0.076)	(0.191)	(0.157)	(0.138)	(0.087)	(0.066)
Free State	-0.668***	-1.278***	-0.712***	-0.641***	-0.529***	-0.563***
	(0.056)	(0.178)	(0.112)	(0.090)	(0.066)	(0.053)
KwaZulu-Natal	-0.364***	-0.828***	-0.732***	-0.521***	-0.187***	-0.212***
	(0.045)	(0.126)	(0.101)	(0.080)	(0.053)	(0.041)
North West	-0.635***	-0.622***	-0.532***	-0.726***	-0.509***	-0.589***

	(0.064)	(0.153)	(0.128)	(0.113)	(0.075)	(0.059)
Mpumalanga	-0.330***	-1.357***	-0.449***	-0.213**	-0.179**	-0.344***
	(0.073)	(0.172)	(0.153)	(0.105)	(0.079)	(0.061)
Limpopo	-0.122**	-0.535***	0.524***	0.015	-0.211***	-0.412***
	(0.059)	(0.171)	(0.139)	(0.103)	(0.070)	(0.049)
2012	0.120***	0.292***	0.249***	0.102	0.092*	0.004
	(0.041)	(0.092)	(0.082)	(0.068)	(0.048)	(0.036)
2013	0.205***	0.345***	0.416***	0.201***	0.170***	0.051
	(0.043)	(0.107)	(0.083)	(0.069)	(0.052)	(0.037)
2014	0.317***	0.588***	0.655***	0.267***	0.254***	0.096***
	(0.041)	(0.101)	(0.086)	(0.070)	(0.050)	(0.035)
2015	0.392***	0.701***	0.804***	0.442***	0.237***	0.155***
	(0.034)	(0.101)	(0.083)	(0.063)	(0.049)	(0.033)
2016	0.459***	0.834***	0.914***	0.512***	0.325***	0.202***
	(0.034)	(0.106)	(0.087)	(0.066)	(0.049)	(0.033)
2017	0.537***	0.956***	1.055***	0.630***	0.401***	0.267***
	(0.035)	(0.112)	(0.093)	(0.069)	(0.052)	(0.036)
Constant	7.834***	25.825***	14.155***	11.650***	11.170***	-10.753***
	(0.098)	(6.557)	(3.684)	(1.711)	(0.634)	(0.507)
R-squared	0.207	0.349	0.232	0.145	0.117	0.234
F-statistic	757	382	275	166	139	523
Prob < F	0	0	0	0	0	0
Sample	338312	42837	58068	70165	95364	84512
Population	226310105	24180951	35770497	51944580	66177466	55473348

Source: Own Calculations, Pooled GHS 2011-2017.
Note: Standard errors in parenthesis. *** significant at the 1% level, ** significant at the 5% level and * significant at the 10% level.

Table C5: An OLS estimation of the association between disability and educational attainment for adults of working age, by birth cohort (multiple measure)

		Birth Cohorts				
		1	**2**	**3**	**4**	**5**
	All Adults (Working Age)	**1951 to 1960**	**1961 to 1970**	**1971 to 1980**	**1981 to 1990**	**1991 to 2000**
Disability (Multiple)	-2.420***	-1.114***	-1.602***	-2.587***	-3.692***	-3.456***
	(0.098)	(0.118)	(0.141)	(0.215)	(0.260)	(0.272)
Age	0.298***	-0.370	0.024	0.080	0.072	1.916***
	(0.005)	(0.227)	(0.155)	(0.091)	(0.046)	(0.050)
Age Squared	-0.005***	0.002	-0.002	-0.002*	-0.002*	-0.041***
	(0.000)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)
African	-2.672***	-5.091***	-3.626***	-2.387***	-1.848***	-1.120***
	(0.048)	(0.099)	(0.074)	(0.073)	(0.069)	(0.055)
Coloured	-2.605***	-4.282***	-3.243***	-2.408***	-1.994***	-1.083***
	(0.060)	(0.133)	(0.103)	(0.091)	(0.086)	(0.066)
Indian	-1.026***	-2.319***	-1.248***	-0.689***	-0.493***	-0.110
	(0.078)	(0.162)	(0.147)	(0.113)	(0.120)	(0.088)
Female	0.206***	-0.374***	-0.201***	0.210***	0.397***	0.492***
	(0.014)	(0.051)	(0.041)	(0.032)	(0.024)	(0.019)
Urban	1.276***	2.338***	2.288***	1.598***	0.945***	0.542***
	(0.038)	(0.105)	(0.084)	(0.064)	(0.043)	(0.034)
Western Cape	-0.419***	-0.372***	-0.512***	-0.460***	-0.343***	-0.401***
	(0.048)	(0.121)	(0.090)	(0.082)	(0.065)	(0.051)
Eastern Cape	-0.734***	-0.137	-0.300***	-0.833***	-0.878***	-0.883***
	(0.050)	(0.134)	(0.103)	(0.082)	(0.064)	(0.045)
Northern Cape	-1.215***	-1.829***	-1.729***	-1.483***	-0.833***	-0.813***
	(0.076)	(0.190)	(0.158)	(0.138)	(0.086)	(0.066)

Free State	-0.679***	-1.291***	-0.729***	-0.656***	-0.529***	-0.573***
	(0.056)	(0.179)	(0.112)	(0.091)	(0.065)	(0.053)
KwaZulu-Natal	-0.364***	-0.830***	-0.731***	-0.526***	-0.181***	-0.210***
	(0.045)	(0.126)	(0.101)	(0.080)	(0.053)	(0.040)
North West	-0.649***	-0.646***	-0.557***	-0.744***	-0.508***	-0.596***
	(0.064)	(0.154)	(0.129)	(0.114)	(0.075)	(0.060)
Mpumalanga	-0.340***	-1.363***	-0.464***	-0.229**	-0.190**	-0.350***
	(0.073)	(0.173)	(0.153)	(0.105)	(0.079)	(0.060)
Limpopo	-0.118**	-0.524***	0.532***	0.015	-0.209***	-0.408***
	(0.059)	(0.171)	(0.139)	(0.104)	(0.070)	(0.049)
2012	0.116***	0.288***	0.253***	0.098	0.083*	-0.004
	(0.041)	(0.092)	(0.082)	(0.068)	(0.048)	(0.036)
2013	0.205***	0.344***	0.420***	0.202***	0.169***	0.049
	(0.043)	(0.107)	(0.083)	(0.070)	(0.052)	(0.037)
2014	0.320***	0.588***	0.665***	0.270***	0.256***	0.095***
	(0.041)	(0.101)	(0.086)	(0.070)	(0.050)	(0.035)
2015	0.392***	0.702***	0.808***	0.449***	0.228***	0.152***
	(0.034)	(0.101)	(0.083)	(0.063)	(0.049)	(0.033)
2016	0.462***	0.837***	0.919***	0.514***	0.328***	0.201***
	(0.034)	(0.106)	(0.087)	(0.066)	(0.049)	(0.033)
2017	0.540***	0.961***	1.062***	0.635***	0.401***	0.268***
	(0.035)	(0.112)	(0.093)	(0.069)	(0.052)	(0.036)
Constant	7.824***	25.812***	14.301***	11.734***	11.091***	-10.702***
	(0.098)	(6.559)	(3.685)	(1.713)	(0.633)	(0.507)
R-squared	0.205	0.349	0.231	0.143	0.114	0.234
F-statistic	749	381	272	163	137	523
Prob < F	0	0	0	0	0	0
Sample	338312	42837	58068	70165	95364	84512
Population	226310105	24180951	35770497	51944580	66177466	55473348

Source: Own Calculations, Pooled GHS 2011-2017.
Note: Standard errors in parenthesis. *** significant at the 1% level, ** significant at the 5% level and * significant at the 10% level.

Table C6: An OLS estimation of the association between disability and educational attainment for adults of working age, by birth cohort (disability types)

		Birth Cohorts				
		1	**2**	**3**	**4**	**5**
	All Adults (Working Age)	**1951 to 1960**	**1961 to 1970**	**1971 to 1980**	**1981 to 1990**	**1991 to 2000**
Sight						
Moderate	0.410***	0.332***	0.358***	0.537***	0.698***	0.336***
	(0.038)	(0.074)	(0.068)	(0.078)	(0.062)	(0.051)
Severe	0.048	-0.166	-0.049	0.133	0.633***	0.007
	(0.098)	(0.158)	(0.178)	(0.229)	(0.210)	(0.164)
Hearing						
Moderate	-0.538***	-0.488***	-0.830***	-0.683***	-0.471***	-0.121
	(0.077)	(0.138)	(0.156)	(0.180)	(0.152)	(0.120)
Severe	-1.432***	-1.011***	-1.199***	-1.664***	-1.600***	-1.186***
	(0.188)	(0.311)	(0.367)	(0.447)	(0.325)	(0.351)
Physical						
Moderate	-0.892***	-0.880***	-1.060***	-0.754***	-0.420*	0.017
	(0.093)	(0.119)	(0.147)	(0.233)	(0.241)	(0.325)
Severe	-1.165***	-0.460**	-1.179***	-0.899***	-1.342***	-2.139***
	(0.131)	(0.180)	(0.232)	(0.297)	(0.333)	(0.419)
Communication						
Moderate	0.277	0.352	0.552	0.218	0.044	-0.022
	(0.268)	(0.473)	(0.486)	(0.548)	(0.532)	(0.511)
Severe	-2.208***	0.455	-1.860***	-2.520***	-1.865***	-2.465***
	(0.282)	(0.749)	(0.573)	(0.708)	(0.488)	(0.511)

Cognitive						
Moderate	-1.628***	-1.224***	-1.378***	-1.627***	-2.011***	-1.447***
	(0.092)	(0.172)	(0.165)	(0.195)	(0.197)	(0.160)
Severe	-3.420***	-1.398***	-2.464***	-3.879***	-4.231***	-3.590***
	(0.163)	(0.270)	(0.271)	(0.355)	(0.354)	(0.337)
Self-care						
Moderate	-0.061	0.051	-0.024	-0.235	-0.382	-0.698
	(0.234)	(0.389)	(0.416)	(0.455)	(0.530)	(0.510)
Severe	-1.241***	-0.397	-0.487	-0.800	-2.575***	-1.683***
	(0.236)	(0.408)	(0.408)	(0.522)	(0.473)	(0.552)
Age	0.349***	-0.360	0.001	0.126	0.074	1.928***
	(0.004)	(0.228)	(0.155)	(0.091)	(0.046)	(0.050)
Age Squared	-0.006***	0.002	-0.002	-0.003**	-0.002**	-0.041***
	(0.000)	(0.002)	(0.002)	(0.001)	(0.001)	(0.001)
African	-2.627***	-5.065***	-3.610***	-2.383***	-1.821***	-1.119***
	(0.048)	(0.099)	(0.075)	(0.073)	(0.069)	(0.054)
Coloured	-2.562***	-4.270***	-3.226***	-2.385***	-1.968***	-1.078***
	(0.059)	(0.133)	(0.103)	(0.090)	(0.085)	(0.066)
Indian	-1.013***	-2.312***	-1.236***	-0.699***	-0.496***	-0.116
	(0.076)	(0.164)	(0.143)	(0.114)	(0.120)	(0.087)
Female	0.204***	-0.386***	-0.215***	0.200***	0.389***	0.487***
	(0.013)	(0.052)	(0.041)	(0.032)	(0.023)	(0.019)
Urban	1.230***	2.326***	2.263***	1.561***	0.936***	0.546***
	(0.037)	(0.104)	(0.084)	(0.064)	(0.043)	(0.033)
Western Cape	-0.400***	-0.343***	-0.493***	-0.473***	-0.312***	-0.399***
	(0.048)	(0.121)	(0.091)	(0.082)	(0.065)	(0.051)
Eastern Cape	-0.697***	-0.100	-0.254**	-0.815***	-0.846***	-0.859***
	(0.049)	(0.135)	(0.103)	(0.082)	(0.064)	(0.045)
Northern Cape	-1.179***	-1.817***	-1.677***	-1.500***	-0.810***	-0.801***
	(0.074)	(0.192)	(0.157)	(0.138)	(0.086)	(0.066)
Free State	-0.666***	-1.263***	-0.709***	-0.658***	-0.509***	-0.574***
	(0.055)	(0.177)	(0.112)	(0.091)	(0.065)	(0.052)
KwaZulu-Natal	-0.340***	-0.806***	-0.712***	-0.525***	-0.161***	-0.199***
	(0.044)	(0.126)	(0.101)	(0.080)	(0.053)	(0.040)
North West	-0.587***	-0.572***	-0.486***	-0.688***	-0.452***	-0.550***
	(0.063)	(0.155)	(0.128)	(0.114)	(0.075)	(0.059)
Mpumalanga	-0.337***	-1.356***	-0.473***	-0.245**	-0.176**	-0.343***
	(0.071)	(0.173)	(0.153)	(0.105)	(0.079)	(0.061)
Limpopo	-0.110*	-0.528***	0.523***	0.012	-0.197***	-0.399***
	(0.057)	(0.171)	(0.138)	(0.104)	(0.070)	(0.049)
2012	0.116***	0.283***	0.233***	0.110	0.078	0.005
	(0.040)	(0.093)	(0.083)	(0.068)	(0.048)	(0.035)
2013	0.202***	0.344***	0.426***	0.204***	0.154***	0.039
	(0.042)	(0.108)	(0.083)	(0.070)	(0.052)	(0.037)
2014	0.312***	0.565***	0.653***	0.275***	0.245***	0.084**
	(0.040)	(0.102)	(0.086)	(0.071)	(0.050)	(0.035)
2015	0.385***	0.734***	0.820***	0.461***	0.223***	0.150***
	(0.034)	(0.102)	(0.084)	(0.063)	(0.049)	(0.033)
2016	0.460***	0.838***	0.934***	0.534***	0.325***	0.193***
	(0.034)	(0.107)	(0.087)	(0.066)	(0.049)	(0.033)
2017	0.535***	0.966***	1.053***	0.650***	0.397***	0.263***
	(0.034)	(0.112)	(0.093)	(0.069)	(0.052)	(0.036)
Constant	6.873***	25.459***	14.883***	10.935***	11.028***	-10.810***
	(0.094)	(6.573)	(3.695)	(1.715)	(0.629)	(0.506)
R-squared	0.220	0.352	0.237	0.155	0.132	0.252
F-statistic	610	259	190	118	115	375
Prob < F	0	0	0	0	0	0
Sample	341587	41905	56842	68505	93226	82512
Population	227487424	23618400	34959098	50622552	64596120	54084513

Source: Own Calculations, Pooled GHS 2011-2017.

Note: Standard errors in parenthesis. *** significant at the 1% level, ** significant at the 5% level and * significant at the 10% level.

Table C7: Probit estimation of expanded labour force participation, by disability measure (showing coefficients)

	Broad			Moderate			Severe			UN			Multiple		
	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
Disability	-0.370***	-0.329***	-0.331***	-0.153***	-0.135***	-0.153***	-0.979***	-0.884***	-0.831***	-0.830***	-0.723***	-0.690***	-0.847***	-0.696***	-0.668***
	(0.012)	(0.012)	(0.012)	(0.013)	(0.013)	(0.013)	(0.025)	(0.025)	(0.025)	(0.022)	(0.022)	(0.022)	(0.032)	(0.033)	(0.033)
Age	0.311***	0.293***	0.298***	0.311***	0.294***	0.298***	0.313***	0.296***	0.301***	0.312***	0.295***	0.300***	0.312***	0.294***	0.299***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Age Squared	-0.004***	-0.004***	-0.004***	-0.004***	-0.004***	-0.004***	-0.004***	-0.004***	-0.004***	-0.004***	-0.004***	-0.004***	-0.004***	-0.004***	-0.004***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Primary		0.288***	0.264***		0.307***	0.282***		0.255***	0.237***		0.260***	0.240***		0.277***	0.255***
		(0.021)	(0.020)		(0.021)	(0.021)		(0.021)	(0.020)		(0.020)	(0.020)		(0.021)	(0.020)
Incomplete Secondary		0.427***	0.318***		0.455***	0.343***		0.390***	0.288***		0.392***	0.289***		0.417***	0.310***
		(0.021)	(0.020)		(0.021)	(0.021)		(0.021)	(0.020)		(0.020)	(0.020)		(0.021)	(0.020)
Matric		0.856***	0.671***		0.885***	0.696***		0.817***	0.641***		0.816***	0.640***		0.844***	0.662***
		(0.022)	(0.022)		(0.022)	(0.022)		(0.022)	(0.022)		(0.022)	(0.021)		(0.022)	(0.022)
Tertiary		1.231***	0.965***		1.256***	0.986***		1.186***	0.931***		1.184***	0.930***		1.211***	0.950***
		(0.025)	(0.026)		(0.025)	(0.026)		(0.025)	(0.026)		(0.025)	(0.025)		(0.025)	(0.025)
African		0.009	0.228***		0.012	0.231***		0.011	0.226***		0.013	0.228***		0.013	0.230***
		(0.019)	(0.022)		(0.019)	(0.022)		(0.019)	(0.022)		(0.019)	(0.022)		(0.019)	(0.022)
Coloured		0.066***	0.201***		0.070***	0.206***		0.077***	0.202***		0.074***	0.201***		0.072***	0.204***
		(0.023)	(0.026)		(0.023)	(0.026)		(0.023)	(0.026)		(0.023)	(0.026)		(0.023)	(0.026)
Indian		-0.230***	-0.215***		-0.222***	-0.208***		-0.225***	-0.212***		-0.226***	-0.209***		-0.223***	-0.207***
		(0.030)	(0.034)		(0.030)	(0.034)		(0.030)	(0.034)		(0.030)	(0.033)		(0.030)	(0.033)
Male		0.442***	0.444***		0.442***	0.444***		0.450***	0.451***		0.448***	0.450***		0.445***	0.447***
		(0.007)	(0.008)		(0.007)	(0.008)		(0.007)	(0.008)		(0.007)	(0.007)		(0.007)	(0.007)
Married or living together			-0.012			-0.007			-0.016			-0.016			-0.010
			(0.010)			(0.010)			(0.010)			(0.010)			(0.010)
Divorced or widowed			0.122***			0.121***			0.114***			0.116***			0.118***
			(0.016)			(0.016)			(0.016)			(0.016)			(0.016)
Urban			0.171***			0.170***			0.171***			0.171***			0.170***
			(0.014)			(0.014)			(0.014)			(0.014)			(0.014)
Number of children 15 and under			-0.001			0.003			-0.003			-0.004			-0.000
			(0.006)			(0.006)			(0.006)			(0.006)			(0.006)
Number of			0.007			0.009*			0.007			0.006			0.007*

working age adults (16 to 59 years)					
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Number of older adults (60 years +)	0.084***	0.096***	0.081***	0.079***	0.089***
	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)
Net number of employed adults	-0.053***	-0.054***	-0.052***	-0.051***	-0.052***
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Western Cape	-0.014	-0.011	-0.001	0.005	0.000
	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)
Eastern Cape	-0.216***	-0.215***	-0.211***	-0.208***	-0.209***
	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)
Northern Cape	-0.030	-0.031	-0.034	-0.030	-0.031
	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)
Free State	-0.016	-0.023	-0.023	-0.011	-0.016
	(0.020)	(0.020)	(0.020)	(0.019)	(0.019)
KwaZulu-Natal	0.034*	0.038**	0.040**	0.047***	0.048***
	(0.018)	(0.018)	(0.017)	(0.017)	(0.017)
North West	-0.020	-0.023	-0.016	-0.007	-0.013
	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)
Mpumalanga	0.047**	0.046**	0.052**	0.058***	0.054**
	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)
Limpopo	-0.381***	-0.374***	-0.375***	-0.369***	-0.365***
	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)
Household earned income	0.007***	0.007***	0.007***	0.007***	0.007***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Household earned income squared	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***

			(0.000)			(0.000)			(0.000)			(0.000)			(0.000)
Household other income			-0.000***			-0.000***			-0.000***			-0.000***			-0.000***
			(0.000)			(0.000)			(0.000)			(0.000)			(0.000)
Household grant income			-0.157***			-0.166***			-0.152***			-0.151***			-0.159***
			(0.007)			(0.007)			(0.007)			(0.007)			(0.007)
2012			0.361***			0.358***			0.362***			0.361***			0.358***
			(0.016)			(0.016)			(0.016)			(0.016)			(0.016)
2013			0.400***			0.398***			0.400***			0.401***			0.399***
			(0.016)			(0.016)			(0.016)			(0.016)			(0.016)
2014			0.435***			0.436***			0.437***			0.432***			0.432***
			(0.016)			(0.016)			(0.016)			(0.016)			(0.016)
2015			0.443***			0.442***			0.445***			0.444***			0.443***
			(0.016)			(0.016)			(0.016)			(0.016)			(0.016)
2016			0.395***			0.397***			0.400***			0.395***			0.395***
			(0.016)			(0.016)			(0.016)			(0.016)			(0.016)
2017			0.421***			0.424***			0.425***			0.419***			0.420***
			(0.016)			(0.016)			(0.016)			(0.016)			(0.016)
Constant	-4.911***	-5.480***	-5.871***	-4.925***	-5.520***	-5.910***	-4.946***	-5.485***	-5.895***	-4.930***	-5.475***	-5.886***	-4.926***	-5.492***	-5.898***
	(0.031)	(0.043)	(0.053)	(0.031)	(0.043)	(0.053)	(0.031)	(0.044)	(0.053)	(0.031)	(0.043)	(0.052)	(0.031)	(0.043)	(0.052)
F-statistic	10550	3319	1033	10191	3257	1013	10598	3335	1041	10709	3360	1048	10463	3317	1031
Prob < F	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sample	336477	331300	329679	336477	331300	329679	335991	330823	329209	343705	338312	336572	343705	338312	336572
Population	224964000	221245077	220146287	224964000	221245077	220146287	224635262	220922382	219828531	230196156	226310105	225128573	230196156	226310105	225128573

Source: Own Calculations, Pooled GHS 2011-2017.

Note: Standard errors in parenthesis. *** significant at the 1% level, ** significant at the 5% level and * significant at the 10% level. Earnings/income values are measured in thousands of Rands per month and are inflation adjusted with 2017 as the base year.

Table C8: Probit estimation of official labour force participation, by disability measure (showing coefficients)

	Broad			Moderate		Severe			UN				Multiple		
	I	II	III	I	II	I	II	III	I	II	I	II	III	I	II
Disability	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	0.323***	0.280***	0.288***	0.123***	0.102***	0.133***	0.933***	0.832***	0.763***	0.813***	0.696***	0.651***	0.847***	0.684***	0.644***
	(0.012)	(0.012)	(0.012)	(0.013)	(0.012)	(0.012)	(0.024)	(0.025)	(0.024)	(0.021)	(0.021)	(0.021)	(0.030)	(0.031)	(0.031)
Age	0.290***	0.274***	0.272***	0.291***	0.275***	0.272***	0.292***	0.276***	0.274***	0.291***	0.275***	0.273***	0.291***	0.275***	0.273***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Age Squared	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	0.004***	0.003***	0.003***	0.004***	0.003***	0.003***	0.004***	0.003***	0.003***	0.004***	0.003***	0.003***	0.004***	0.003***	0.003***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Primary		0.250***	0.217***		0.265***	0.231***		0.221***	0.194***		0.222***	0.193***		0.237***	0.206***
		(0.021)	(0.021)		(0.021)	(0.021)		(0.021)	(0.021)		(0.021)	(0.020)		(0.021)	(0.021)
Incomplete Secondary		0.448***	0.313***		0.470***	0.333***		0.416***	0.289***		0.412***	0.285***		0.434***	0.302***
		(0.021)	(0.021)		(0.022)	(0.021)		(0.021)	(0.021)		(0.021)	(0.021)		(0.021)	(0.021)
Matric		0.889***	0.665***		0.912***	0.685***		0.855***	0.640***		0.850***	0.635***		0.874***	0.654***
		(0.022)	(0.022)		(0.023)	(0.022)		(0.022)	(0.022)		(0.022)	(0.022)		(0.022)	(0.022)
Tertiary		1.338***	0.997***		1.357***	1.013***		1.300***	0.969***		1.292***	0.962***		1.315***	0.979***
		(0.025)	(0.026)		(0.025)	(0.026)		(0.025)	(0.026)		(0.025)	(0.025)		(0.025)	(0.025)
African		-	0.155***		-	0.158***		-	0.153***		-	0.156***		-	0.157***
		0.154***			0.151***			0.153***			0.150***			0.150***	
		(0.018)	(0.021)		(0.018)	(0.021)		(0.019)	(0.021)		(0.018)	(0.021)		(0.018)	(0.021)
Coloured		-0.024	0.156***		-0.020	0.161***		-0.015	0.157***		-0.016	0.157***		-0.018	0.160***
		(0.022)	(0.024)		(0.022)	(0.024)		(0.022)	(0.025)		(0.022)	(0.024)		(0.022)	(0.024)
Indian		-	-		-	-		-	-		-	-		-	-
		0.215***	0.143***		0.208***	0.138***		0.211***	0.141***		0.212***	0.139***		0.209***	0.137***
		(0.030)	(0.033)		(0.030)	(0.033)		(0.030)	(0.033)		(0.030)	(0.033)		(0.030)	(0.033)
Male		0.476***	0.472***		0.476***	0.472***		0.483***	0.478***		0.481***	0.476***		0.479***	0.475***
		(0.007)	(0.008)		(0.007)	(0.008)		(0.007)	(0.008)		(0.007)	(0.008)		(0.007)	(0.008)
Married or living together			0.033***			0.037***			0.030***			0.031***			0.035***
			(0.010)			(0.010)			(0.010)			(0.010)			(0.010)
Divorced or widowed			0.136***			0.134***			0.129***			0.131***			0.131***
			(0.016)			(0.016)			(0.016)			(0.016)			(0.016)

Urban	0.259***	0.258***	0.259***	0.259***	0.258***
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
Number of children 15 and under	-0.018***	-0.015***	-0.020***	-0.021***	-0.018***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Number of working age adults (16 to 59 years)	-0.017***	-0.016***	-0.017***	-0.018***	-0.017***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Number of older adults (60 years +)	0.053***	0.063***	0.051***	0.048***	0.057***
	(0.012)	(0.012)	(0.012)	(0.012)	(0.012)
Net number of employed adults	-0.028***	-0.029***	-0.027***	-0.027***	-0.028***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Western Cape	-0.009	-0.007	0.002	0.007	0.002
	(0.020)	(0.020)	(0.020)	(0.019)	(0.019)
Eastern Cape	-0.221***	-0.220***	-0.218***	-0.214***	-0.215***
	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)
Northern Cape	-0.065**	-0.067**	-0.069***	-0.067**	-0.069***
	(0.026)	(0.026)	(0.026)	(0.027)	(0.027)
Free State	-0.077***	-0.083***	-0.082***	-0.074***	-0.078***
	(0.021)	(0.020)	(0.020)	(0.020)	(0.020)
KwaZulu-Natal	-0.027	-0.023	-0.022	-0.015	-0.014
	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)
North West	-0.051**	-0.054**	-0.049**	-0.041*	-0.047**
	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)

Mpumalanga			0.096***			0.095***			0.101***			0.103***			0.099***
			(0.022)			(0.022)			(0.022)			(0.022)			(0.021)
Limpopo			-0.332***			-0.326***			-0.327***			-0.323***			-0.320***
			(0.024)			(0.023)			(0.024)			(0.023)			(0.023)
Household earned income			0.010***			0.010***			0.010***			0.009***			0.010***
			(0.001)			(0.001)			(0.001)			(0.001)			(0.001)
Household earned income squared			-0.000***			-0.000***			-0.000***			-0.000***			-0.000***
			(0.000)			(0.000)			(0.000)			(0.000)			(0.000)
Household other income			-0.000***			-0.000***			-0.000***			-0.000***			-0.000***
			(0.000)			(0.000)			(0.000)			(0.000)			(0.000)
Household grant income			-0.157***			-0.163***			-0.151***			-0.151***			-0.158***
			(0.007)			(0.007)			(0.007)			(0.007)			(0.007)
2012			0.096***			0.095***			0.096***			0.095***			0.093***
			(0.016)			(0.016)			(0.016)			(0.016)			(0.016)
2013			0.104***			0.103***			0.103***			0.105***			0.104***
			(0.016)			(0.016)			(0.016)			(0.016)			(0.016)
2014			0.129***			0.131***			0.132***			0.127***			0.128***
			(0.016)			(0.016)			(0.016)			(0.016)			(0.016)
2015			0.131***			0.131***			0.132***			0.131***			0.131***
			(0.016)			(0.016)			(0.016)			(0.016)			(0.016)
2016			0.098***			0.100***			0.101***			0.099***			0.100***
			(0.016)			(0.016)			(0.016)			(0.016)			(0.016)
2017			0.145***			0.149***			0.149***			0.144***			0.146***
			(0.016)			(0.016)			(0.016)			(0.016)			(0.016)
Constant	-4.837***	-5.336***	-5.405***	-4.854***	-5.374***	-5.443***	-4.867***	-5.339***	-5.426***	-4.853***	-5.327***	-5.410***	-4.853***	-5.345***	-5.424***
	(0.031)	(0.043)	(0.051)	(0.031)	(0.043)	(0.051)	(0.031)	(0.043)	(0.051)	(0.031)	(0.043)	(0.051)	(0.031)	(0.043)	(0.051)
F-statistic	10135	3353	1031	9791	3287	1012	10272	3386	1044	10419	3410	1043	10093	3352	1023

Prob < F	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sample	336477	331300	329679	336477	331300	329679	335991	330823	329209	343705	338312	336572	343705	338312	336572
Population (mill)	224,964	221,245	220,146	224,964	221,245	220,146	224,635	220,922	219,828	230,196	226,310	225,128	230,196	226,310	225,128

Source: Own Calculations, Pooled GHS 2011-2017.

Note: Standard errors in parenthesis. *** significant at the 1% level, ** significant at the 5% level and * significant at the 10% level. Earnings/income values are measured in thousands of Rands per month and are inflation adjusted with 2017 as the base year.

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Table C9: Probit estimation of both expanded and official labour force participation, by disability type (showing coefficients)

		Broad			Official		
		I	II	III	I	II	III
Sight							
	Moderate	0.061***	0.043***	0.006	0.097***	0.075***	0.020
		(0.015)	(0.015)	(0.015)	(0.014)	(0.014)	(0.015)
	Severe	-0.225***	-0.212***	-0.231***	-0.183***	-0.167***	-0.192***
		(0.036)	(0.037)	(0.037)	(0.036)	(0.037)	(0.036)
Hearing							
	Moderate	0.023	0.081**	0.073**	-0.019	0.052	0.043
		(0.033)	(0.033)	(0.034)	(0.032)	(0.032)	(0.032)
	Severe	-0.536***	-0.471***	-0.424***	-0.487***	-0.414***	-0.348***
		(0.077)	(0.077)	(0.076)	(0.075)	(0.077)	(0.076)
Physical							
	Moderate	-0.566***	-0.499***	-0.472***	-0.574***	-0.498***	-0.467***
		(0.035)	(0.036)	(0.036)	(0.035)	(0.037)	(0.036)
	Severe	-1.231***	-1.218***	-1.162***	-1.229***	-1.219***	-1.144***
		(0.051)	(0.052)	(0.052)	(0.055)	(0.055)	(0.055)
Communication							
	Moderate	0.137	0.140	0.162*	0.197**	0.154*	0.187**
		(0.097)	(0.102)	(0.097)	(0.090)	(0.093)	(0.086)
	Severe	-0.625***	-0.636***	-0.608***	-0.552***	-0.567***	-0.515***
		(0.127)	(0.136)	(0.132)	(0.138)	(0.144)	(0.138)
Cognitive							
	Moderate	-0.496***	-0.359***	-0.357***	-0.536***	-0.374***	-0.366***
		(0.035)	(0.037)	(0.035)	(0.033)	(0.035)	(0.034)
	Severe	-1.150***	-0.932***	-0.848***	-1.188***	-0.929***	-0.812***
		(0.059)	(0.060)	(0.058)	(0.059)	(0.059)	(0.057)
Self-care							
	Moderate	-0.167**	-0.262***	-0.262***	-0.263***	-0.344***	-0.326***
		(0.078)	(0.080)	(0.079)	(0.073)	(0.076)	(0.073)
	Severe	-0.622***	-0.620***	-0.568***	-0.664***	-0.666***	-0.589***
		(0.094)	(0.094)	(0.094)	(0.103)	(0.100)	(0.100)
Age		0.314***	0.297***	0.302***	0.293***	0.277***	0.275***
		(0.002)	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Age Squared		-0.004***	-0.004***	-0.004***	-0.004***	-0.003***	-0.003***
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Primary			0.230***	0.215***		0.198***	0.175***
			(0.021)	(0.021)		(0.021)	(0.021)
Incomplete secondary			0.354***	0.257***		0.383***	0.262***
			(0.021)	(0.021)		(0.022)	(0.021)
Matric			0.778***	0.607***		0.819***	0.611***
			(0.022)	(0.022)		(0.023)	(0.022)
Tertiary			1.145***	0.898***		1.262***	0.940***
			(0.025)	(0.026)		(0.026)	(0.026)
African			0.011	0.221***		-0.153***	0.149***
			(0.019)	(0.022)		(0.018)	(0.021)
Coloured			0.074***	0.197***		-0.017	0.153***
			(0.023)	(0.026)		(0.022)	(0.025)
Indian			-0.225***	-0.216***		-0.210***	-0.144***
			(0.030)	(0.034)		(0.030)	(0.033)
Male			0.454***	0.454***		0.487***	0.481***
			(0.007)	(0.008)		(0.007)	(0.008)
Married or living together				-0.023**			0.025**
				(0.010)			(0.010)
Divorced or widowed				0.113***			0.129***
				(0.016)			(0.016)
Urban				0.174***			0.262***
				(0.014)			(0.014)
Number of children 15 and under				-0.006			-0.023***
				(0.006)			(0.006)
Number of working age adults (16 to 59 years)				0.006			-0.018***

			(0.004)			(0.005)
Number of older adults (60 years +)			0.071***			0.041***
			(0.012)			(0.012)
Net number of employed adults			-0.051***			-0.026***
			(0.007)			(0.008)
Western Cape			-0.005			-0.002
			(0.019)			(0.020)
Eastern Cape			-0.209***			-0.215***
			(0.020)			(0.019)
Northern Cape			-0.036			-0.071***
			(0.025)			(0.027)
Free State			-0.019			-0.079***
			(0.020)			(0.021)
KwaZulu-Natal			0.043**			-0.019
			(0.018)			(0.018)
North West			-0.008			-0.040*
			(0.021)			(0.022)
Mpumalanga			0.049**			0.099***
			(0.022)			(0.022)
Limpopo			-0.375***			-0.326***
			(0.024)			(0.024)
Household earned income			0.007***			0.010***
			(0.001)			(0.001)
Household earned income squared			-0.000***			-0.000***
			(0.000)			(0.000)
Household other income			-0.000***			-0.000***
			(0.000)			(0.000)
Household grant income			-0.143***			-0.144***
			(0.007)			(0.007)
2012			0.363***			0.096***
			(0.016)			(0.016)
2013			0.405***			0.107***
			(0.016)			(0.016)
2014			0.439***			0.132***
			(0.017)			(0.017)
2015			0.448***			0.134***
			(0.016)			(0.016)
2016			0.401***			0.101***
			(0.016)			(0.016)
2017			0.426***			0.148***
			(0.016)			(0.016)
Constant	-4.958***	-5.467***	-5.881***	-4.879***	-5.324***	-5.411***
	(0.031)	(0.044)	(0.053)	(0.031)	(0.044)	(0.051)
F-statistic	2272	1669	797	2183	1681	793
Prob < F	0	0	0	0	0	0
Sample	335844	330687	329074	335844	330687	329074
Population	224545519	220841882	219748720	224545519	220841882	219748720

Source: Own Calculations, Pooled GHS 2011-2017.

Note: Standard errors in parenthesis. *** significant at the 1% level, ** significant at the 5% level and * significant at the 10% level. Earnings/income values are measured in thousands of Rands per month and are inflation adjusted with 2017 as the base year.

Table C10: Probit estimation of official labour force participation, by disability measure (showing marginal effects)

	Broad			Moderate		Severe			UN		Multiple				
	I	II	III	I	II	I	II	III	I	II	I	II	III	I	II
Disability	-0.080***	-0.064***	-0.075***	-0.030***	-0.023***	-0.034***	-0.226***	-0.188***	-0.201***	-0.199***	-0.158***	-0.172***	-0.206***	-0.156***	-0.170***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.005)	(0.005)	(0.006)	(0.005)	(0.005)	(0.006)	(0.007)	(0.007)	(0.008)
Age	0.011	0.010	0.010	0.011	0.010	0.010	0.011	0.010	0.010	0.011	0.010	0.010	0.011	0.010	0.010
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Primary		0.054***	0.054***		0.058***	0.058***		0.048***	0.049***		0.048***	0.048***		0.052***	0.052***
		(0.004)	(0.005)		(0.004)	(0.005)		(0.004)	(0.005)		(0.004)	(0.005)		(0.004)	(0.005)
Incomplete secondary		0.096***	0.078***		0.101***	0.083***		0.089***	0.072***		0.089***	0.071***		0.093***	0.075***
		(0.004)	(0.005)		(0.004)	(0.005)		(0.004)	(0.005)		(0.004)	(0.005)		(0.004)	(0.005)
Matric		0.201***	0.169***		0.206***	0.175***		0.193***	0.163***		0.192***	0.162***		0.197***	0.167***
		(0.005)	(0.005)		(0.005)	(0.005)		(0.005)	(0.005)		(0.005)	(0.005)		(0.005)	(0.005)
Tertiary		0.279***	0.235***		0.283***	0.239***		0.271***	0.229***		0.270***	0.228***		0.275***	0.232***
		(0.005)	(0.005)		(0.005)	(0.005)		(0.005)	(0.005)		(0.005)	(0.005)		(0.005)	(0.005)
African		-0.034***	0.040***		-0.034***	0.041***		-0.034***	0.039***		-0.033***	0.040***		-0.033***	0.040***
		(0.004)	(0.005)		(0.004)	(0.005)		(0.004)	(0.005)		(0.004)	(0.005)		(0.004)	(0.005)
Coloured		-0.005	0.039***		-0.004	0.041***		-0.003	0.040***		-0.004	0.040***		-0.004	0.040***
		(0.005)	(0.006)		(0.005)	(0.006)		(0.005)	(0.006)		(0.005)	(0.006)		(0.005)	(0.006)
Indian		-0.049***	-0.037***		-0.047***	-0.036***		-0.048***	-0.036***		-0.048***	-0.036***		-0.047***	-0.035***
		(0.007)	(0.009)		(0.007)	(0.009)		(0.007)	(0.009)		(0.007)	(0.009)		(0.007)	(0.009)
Male		0.108***	0.122***		0.108***	0.122***		0.109***	0.123***		0.108***	0.123***		0.108***	0.123***
		(0.002)	(0.002)		(0.002)	(0.002)		(0.002)	(0.002)		(0.002)	(0.002)		(0.002)	(0.002)
Married or living together			0.009***			0.010***			0.008***			0.008***			0.009***
			(0.002)			(0.003)			(0.002)			(0.002)			(0.002)
Divorced or widowed			0.034***			0.034***			0.033***			0.033***			0.033***
			(0.004)			(0.004)			(0.004)			(0.004)			(0.004)
Urban			0.068***			0.068***			0.068***			0.068***			0.068***
			(0.004)			(0.004)			(0.004)			(0.004)			(0.004)
Number of children 15 and under			-0.005***			-0.004***			-0.005***			-0.005***			-0.005***
			(0.001)			(0.001)			(0.001)			(0.001)			(0.001)
Number of working age adults (16 to 59 years)			-0.004***			-0.004***			-0.004***			-0.005***			-0.004***
			(0.001)			(0.001)			(0.001)			(0.001)			(0.001)
Number of older			0.014***			0.016***			0.013***			0.012***			0.015***

adults (60 years +)					
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Net number of employed adults	-0.007***	-0.008***	-0.007***	-0.007***	-0.007***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Western Cape	-0.002	-0.002	0.000	0.002	0.001
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Eastern Cape	-0.058***	-0.058***	-0.057***	-0.056***	-0.056***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Northern Cape	-0.017**	-0.017**	-0.018***	-0.017**	-0.018***
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Free State	-0.020***	-0.021***	-0.021***	-0.019***	-0.020***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
KwaZulu-Natal	-0.007	-0.006	-0.006	-0.004	-0.004
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
North West	-0.013**	-0.014**	-0.013**	-0.011*	-0.012**
	(0.006)	(0.006)	(0.006)	(0.005)	(0.005)
Mpumalanga	0.025***	0.024***	0.026***	0.026***	0.025***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
Limpopo	-0.087***	-0.086***	-0.086***	-0.085***	-0.084***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Household earned income	0.002***	0.002***	0.002***	0.002***	0.002***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Household earned income squared	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Household other income	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Household grant income	-0.040***	-0.042***	-0.039***	-0.039***	-0.040***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
2012	0.024***	0.024***	0.024***	0.024***	0.024***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
2013	0.026***	0.026***	0.026***	0.027***	0.027***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
2014	0.033***	0.033***	0.033***	0.032***	0.032***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
2015	0.033***	0.033***	0.033***	0.033***	0.033***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)

2016	0.025***	0.026***	0.026***	0.025***	0.025***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
2017	0.037***	0.038***	0.038***	0.037***	0.037***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)

Source: Own Calculations, Pooled GHS 2011-2017.

Note: Standard errors in parenthesis. *** significant at the 1% level, ** significant at the 5% level and * significant at the 10% level. Earnings/income values are measured in thousands of Rands per month and are inflation adjusted with 2017 as the base year.

Table C11: Probit estimation of expanded and official labour force participation, by disability type (showing marginal effects)

		Broad			Official		
		I	II	III	I	II	III
Sight							
	Moderate	0.014***	0.009***	0.001	0.023***	0.017***	0.005
		(0.003)	(0.003)	(0.004)	(0.003)	(0.003)	(0.004)
	Severe	-0.051***	-0.045***	-0.055***	-0.044***	-0.037***	-0.049***
		(0.008)	(0.008)	(0.009)	(0.009)	(0.008)	(0.009)
Hearing							
	Moderate	0.005	0.017**	0.018**	-0.005	0.012	0.011
		(0.007)	(0.007)	(0.008)	(0.008)	(0.007)	(0.008)
	Severe	-0.121***	-0.099***	-0.101***	-0.118***	-0.092***	-0.089***
		(0.017)	(0.016)	(0.018)	(0.018)	(0.017)	(0.019)
Physical							
	Moderate	-0.127***	-0.105***	-0.112***	-0.139***	-0.111***	-0.119***
		(0.008)	(0.008)	(0.009)	(0.009)	(0.008)	(0.009)
	Severe	-0.277***	-0.257***	-0.277***	-0.297***	-0.272***	-0.291***
		(0.012)	(0.011)	(0.012)	(0.013)	(0.012)	(0.014)
Communication							
	Moderate	0.031	0.029	0.039*	0.048**	0.034*	0.048**
		(0.022)	(0.021)	(0.023)	(0.022)	(0.021)	(0.022)
	Severe	-0.141***	-0.134***	-0.145***	-0.133***	-0.126***	-0.131***
		(0.029)	(0.029)	(0.031)	(0.033)	(0.032)	(0.035)
Cognitive							
	Moderate	-0.112***	-0.076***	-0.085***	-0.130***	-0.083***	-0.093***
		(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.009)
	Severe	-0.259***	-0.197***	-0.202***	-0.287***	-0.207***	-0.207***
		(0.013)	(0.013)	(0.014)	(0.014)	(0.013)	(0.015)
Self-care							
	Moderate	-0.038**	-0.055***	-0.062***	-0.064***	-0.077***	-0.083***
		(0.018)	(0.017)	(0.019)	(0.018)	(0.017)	(0.019)
	Severe	-0.140***	-0.131***	-0.135***	-0.161***	-0.148***	-0.150***
		(0.021)	(0.020)	(0.022)	(0.025)	(0.022)	(0.026)
Education:							
Primary			0.048***	0.051***		0.044***	0.045***
			(0.004)	(0.005)		(0.005)	(0.005)
Incomplete Secondary			0.075***	0.061***		0.085***	0.067***
			(0.004)	(0.005)		(0.005)	(0.005)
Matric			0.164***	0.145***		0.183***	0.156***
			(0.005)	(0.005)		(0.005)	(0.006)
Tertiary			0.241***	0.214***		0.281***	0.240***
			(0.005)	(0.006)		(0.006)	(0.007)
Demographic:							
Age		0.071***	0.063***	0.072***	0.071***	0.062***	0.070***
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Age Squared		-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Male			0.096***	0.108***		0.109***	0.122***
			(0.001)	(0.002)		(0.002)	(0.002)
African			0.002	0.053***		-0.034***	0.038***
			(0.004)	(0.005)		(0.004)	(0.005)
Coloured			0.016***	0.047***		-0.004	0.039***
			(0.005)	(0.006)		(0.005)	(0.006)
Indian			-0.047***	-0.051***		-0.047***	-0.037***
			(0.006)	(0.008)		(0.007)	(0.008)
Married or living together				-0.005**			0.006**
				(0.002)			(0.002)
Divorced or widowed				0.027***			0.033***
				(0.004)			(0.004)
Location:							
Urban				0.041***			0.067***
				(0.003)			(0.003)
Western Cape				-0.001			-0.006***

	(0.005)	(0.001)
Eastern Cape	-0.050***	-0.005***
	(0.005)	(0.001)
Northern Cape	-0.009	0.011***
	(0.006)	(0.003)
Free State	-0.005	-0.007***
	(0.005)	(0.002)
KwaZulu-Natal	0.010**	-0.001
	(0.004)	(0.005)
North West	-0.002	-0.055***
	(0.005)	(0.005)
Mpumalanga	0.012**	-0.018***
	(0.005)	(0.007)
Limpopo	-0.089***	-0.020***
	(0.006)	(0.005)
Household Characteristics:		
Number of children 15 and under	-0.002	-0.005
	(0.001)	(0.005)
Number of working age adults (16 to 59 years)	0.001	-0.010*
	(0.001)	(0.005)
Number of older adults (60 years +)	0.017***	0.025***
	(0.003)	(0.006)
Net number of employed adults	-0.012***	-0.083***
	(0.002)	(0.006)
		0.002***
Household earned income	0.002***	(0.000)
	(0.000)	-0.000***
Household earned income squared	-0.000***	(0.000)
	(0.000)	-0.000***
Household other income	-0.000***	(0.000)
	(0.000)	-0.037***
Household grant income	-0.034***	(0.002)
	(0.002)	-0.005
Year of survey:		
2012	0.086***	0.025***
	(0.004)	(0.004)
2013	0.096***	0.027***
	(0.004)	(0.004)
2014	0.105***	0.034***
	(0.004)	(0.004)
2015	0.107***	0.034***
	(0.004)	(0.004)
2016	0.096***	0.026***
	(0.004)	(0.004)
2017	0.101***	0.038***
	(0.004)	(0.004)

Source: Own Calculations, Pooled GHS 2011-2017.

Note: Standard errors in parenthesis. *** significant at the 1% level, ** significant at the 5% level and * significant at the 10% level. Earnings/income values are measured in thousands of Rands per month and are inflation adjusted with 2017 as the base year.

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Table C12: Probit estimation of employment, by disability measure, for adults of working age 16 to 59 years (showing coefficients for expanded definition of unemployment)

	Broad			Moderate		Severe			UN		Multiple				
	I	II	III	I	II	I	II	III	I	II	I	II	III	I	II
Disability	-0.001	0.006	-0.037**	0.039**	0.043***	-0.007	-0.229***	-0.198***	-0.194***	-0.238***	-0.172***	-0.182***	-0.265***	-0.153***	-0.169***
	(0.016)	(0.015)	(0.015)	(0.017)	(0.016)	(0.016)	(0.035)	(0.035)	(0.036)	(0.028)	(0.029)	(0.029)	(0.042)	(0.043)	(0.043)
Age	0.141***	0.143***	0.121***	0.141***	0.143***	0.121***	0.141***	0.142***	0.121***	0.140***	0.143***	0.121***	0.141***	0.143***	0.121***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Age Squared	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Primary		-0.044	-0.030		-0.045	-0.030		-0.046	-0.032		-0.049	-0.036		-0.047	-0.035
		(0.031)	(0.031)		(0.031)	(0.031)		(0.031)	(0.031)		(0.031)	(0.030)		(0.031)	(0.031)
Incomplete secondary		0.058*	0.026		0.058*	0.026		0.055*	0.024		0.050	0.017		0.053*	0.019
		(0.032)	(0.030)		(0.032)	(0.030)		(0.032)	(0.030)		(0.031)	(0.030)		(0.032)	(0.030)
Matric		0.325***	0.270***		0.325***	0.271***		0.321***	0.268***		0.315***	0.260***		0.318***	0.263***
		(0.033)	(0.031)		(0.033)	(0.031)		(0.033)	(0.031)		(0.033)	(0.031)		(0.033)	(0.031)
Tertiary		0.813***	0.662***		0.813***	0.662***		0.812***	0.661***		0.803***	0.651***		0.805***	0.653***
		(0.035)	(0.033)		(0.035)	(0.033)		(0.035)	(0.033)		(0.035)	(0.033)		(0.035)	(0.033)
African		-0.936***	-0.689***		-0.936***	-0.688***		-0.936***	-0.688***		-0.934***	-0.687***		-0.934***	-0.686***
		(0.032)	(0.029)		(0.032)	(0.029)		(0.032)	(0.030)		(0.031)	(0.029)		(0.031)	(0.029)
Coloured		-0.558***	-0.472***		-0.557***	-0.471***		-0.558***	-0.471***		-0.559***	-0.472***		-0.558***	-0.471***
		(0.036)	(0.034)		(0.036)	(0.034)		(0.036)	(0.034)		(0.036)	(0.034)		(0.036)	(0.034)
Indian		-0.289***	-0.219***		-0.288***	-0.218***		-0.288***	-0.218***		-0.293***	-0.224***		-0.292***	-0.223***
		(0.051)	(0.048)		(0.051)	(0.048)		(0.051)	(0.048)		(0.051)	(0.048)		(0.051)	(0.048)
Male		0.323***	0.314***		0.324***	0.315***		0.323***	0.315***		0.323***	0.315***		0.324***	0.315***
		(0.009)	(0.009)		(0.009)	(0.009)		(0.009)	(0.009)		(0.009)	(0.009)		(0.009)	(0.009)
Married or living together			0.243***			0.243***			0.243***			0.244***			0.244***
			(0.011)			(0.011)			(0.011)			(0.011)			(0.011)
Divorced or widowed			0.222***			0.222***			0.223***			0.222***			0.222***
			(0.018)			(0.018)			(0.018)			(0.018)			(0.018)
Urban			0.130***			0.130***			0.130***			0.132***			0.133***
			(0.014)			(0.014)			(0.014)			(0.014)			(0.014)
Number of children 15 and under			-0.048***			-0.048***			-0.048***			-0.049***			-0.049***

	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Number of working age adults (16 to 59 years)	-0.145***	-0.145***	-0.145***	-0.145***	-0.145***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Number of older adults (60 years +)	-0.151***	-0.150***	-0.150***	-0.154***	-0.153***
	(0.014)	(0.014)	(0.014)	(0.013)	(0.013)
Net number of employed adults	0.215***	0.215***	0.215***	0.214***	0.214***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Western Cape	0.200***	0.200***	0.202***	0.203***	0.202***
	(0.022)	(0.022)	(0.022)	(0.021)	(0.021)
Eastern Cape	0.050**	0.050**	0.050**	0.053***	0.053***
	(0.021)	(0.021)	(0.021)	(0.020)	(0.020)
Northern Cape	0.021	0.021	0.021	0.021	0.021
	(0.028)	(0.028)	(0.028)	(0.027)	(0.027)
Free State	-0.111***	-0.112***	-0.111***	-0.110***	-0.111***
	(0.021)	(0.020)	(0.021)	(0.020)	(0.020)
KwaZulu-Natal	0.078***	0.078***	0.078***	0.079***	0.079***
	(0.018)	(0.018)	(0.018)	(0.017)	(0.017)
North West	-0.005	-0.006	-0.004	-0.000	-0.002
	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)
Mpumalanga	0.092***	0.092***	0.093***	0.090***	0.089***
	(0.021)	(0.021)	(0.021)	(0.021)	(0.021)
Limpopo	0.198***	0.199***	0.198***	0.200***	0.201***
	(0.025)	(0.025)	(0.025)	(0.024)	(0.024)
Household grant income	-0.063***	-0.063***	-0.062***	-0.062***	-0.062***
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
2012	-0.242***	-0.243***	-0.242***	-0.245***	-0.245***
	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)
2013	-0.272***	-0.273***	-0.272***	-0.274***	-0.274***
	(0.019)	(0.019)	(0.019)	(0.019)	(0.019)
2014	-0.320***	-0.320***	-0.319***	-0.323***	-0.323***

			(0.018)			(0.018)			(0.018)			(0.018)			(0.018)
2015			-0.319***			-0.319***			-0.318***			-0.321***			-0.322***
			(0.018)			(0.018)			(0.018)			(0.018)			(0.018)
2016			-0.329***			-0.329***			-0.329***			-0.330***			-0.330***
			(0.018)			(0.018)			(0.018)			(0.018)			(0.018)
2017			-0.337***			-0.336***			-0.337***			-0.337***			-0.337***
			(0.018)			(0.018)			(0.018)			(0.018)			(0.018)
Constant	-2.561***	-2.179***	-1.477***	-2.565***	-2.184***	-1.483***	-2.555***	-2.169***	-1.476***	-2.551***	-2.169***	-1.474***	-2.555***	-2.175***	-1.481***
	(0.052)	(0.065)	(0.069)	(0.052)	(0.065)	(0.069)	(0.052)	(0.065)	(0.069)	(0.052)	(0.064)	(0.069)	(0.052)	(0.064)	(0.069)
F-statistic	3284	1243	594	3285	1243	594	3295	1245	595	3349	1253	601	3335	1252	601
Prob < F	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sample	221226	218223	218223	221226	218223	218223	220909	217910	217910	226019	222906	222906	226019	222906	222906
Population	153775219	151505813	151505813	153775219	151505813	151505813	153553852	151287527	151287527	157365418	155004988	155004988	157365418	155004988	155004988

Source: Own Calculations, Pooled GHS 2011-2017.

Note: Standard errors in parenthesis. *** significant at the 1% level, ** significant at the 5% level and * significant at the 10% level. Earnings/income values are measured in thousands of Rands per month and are inflation adjusted with 2017 as the base year.

Table C13: Probit estimation of employment, by disability measure, for adults of working age 16 to 59 years (showing coefficients for official definition of unemployment)

	Broad			Moderate		Severe			UN			Multiple			
	I	II	III	I	II	I	II	III	I	II	I	II	III	I	II
Disability	0.028	0.025	-0.012	0.050***	0.046**	0.004	-0.113***	-0.106***	-0.108***	-0.096***	-0.063*	-0.077**	-0.078*	-0.010	-0.026
	(0.017)	(0.017)	(0.017)	(0.018)	(0.018)	(0.018)	(0.040)	(0.041)	(0.042)	(0.032)	(0.033)	(0.034)	(0.047)	(0.047)	(0.049)
Age	0.123***	0.128***	0.105***	0.123***	0.128***	0.106***	0.122***	0.127***	0.105***	0.123***	0.128***	0.106***	0.123***	0.128***	0.106***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
Age Squared	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***	-0.001***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Primary		-0.140***	-0.101***		-0.140***	-0.102***		-0.140***	-0.102***		-0.139***	-0.103***		-0.139***	-0.103***
		(0.034)	(0.034)		(0.034)	(0.034)		(0.034)	(0.034)		(0.033)	(0.034)		(0.033)	(0.034)
Incomplete secondary		-0.128***	-0.108***		-0.128***	-0.108***		-0.129***	-0.109***		-0.129***	-0.111***		-0.128***	-0.110***
		(0.033)	(0.033)		(0.033)	(0.033)		(0.033)	(0.033)		(0.033)	(0.033)		(0.033)	(0.033)
Matric		0.077**	0.094***		0.077**	0.094***		0.076**	0.093***		0.074**	0.090***		0.075**	0.091***
		(0.034)	(0.035)		(0.034)	(0.035)		(0.034)	(0.035)		(0.034)	(0.034)		(0.034)	(0.034)
Tertiary		0.502***	0.434***		0.502***	0.433***		0.502***	0.433***		0.499***	0.429***		0.500***	0.430***
		(0.036)	(0.037)		(0.036)	(0.037)		(0.036)	(0.037)		(0.036)	(0.036)		(0.036)	(0.036)
African		-0.873***	-0.678***		-0.873***	-0.678***		-0.874***	-0.678***		-0.873***	-0.678***		-0.873***	-0.678***
		(0.035)	(0.033)		(0.035)	(0.033)		(0.036)	(0.033)		(0.035)	(0.033)		(0.035)	(0.033)
Coloured		-0.513***	-0.452***		-0.513***	-0.452***		-0.514***	-0.452***		-0.517***	-0.455***		-0.517***	-0.455***
		(0.040)	(0.038)		(0.040)	(0.038)		(0.040)	(0.038)		(0.040)	(0.038)		(0.040)	(0.038)
Indian		-0.301***	-0.250***		-0.300***	-0.250***		-0.300***	-0.249***		-0.308***	-0.257***		-0.307***	-0.257***
		(0.058)	(0.055)		(0.058)	(0.055)		(0.058)	(0.055)		(0.058)	(0.055)		(0.058)	(0.055)
Male		0.253***	0.249***		0.253***	0.249***		0.252***	0.249***		0.253***	0.250***		0.253***	0.250***
		(0.009)	(0.010)		(0.009)	(0.010)		(0.009)	(0.010)		(0.009)	(0.010)		(0.009)	(0.010)
Married or living together			0.252***			0.252***			0.252***			0.253***			0.253***
			(0.012)			(0.012)			(0.012)			(0.011)			(0.011)
Divorced or widowed			0.240***			0.239***			0.241***			0.240***			0.240***
			(0.020)			(0.020)			(0.020)			(0.020)			(0.020)
Urban			0.010			0.010			0.010			0.013			0.013
			(0.016)			(0.016)			(0.016)			(0.016)			(0.016)
Number of children 15 and under			-0.044***			-0.044***			-0.045***			-0.045***			-0.045***
			(0.006)			(0.006)			(0.006)			(0.006)			(0.006)

Number of working age adults (16 to 59 years)	-0.153***	-0.153***	-0.153***	-0.153***	-0.153***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Number of older adults (60 years +)	-0.176***	-0.176***	-0.176***	-0.178***	-0.178***
	(0.015)	(0.015)	(0.015)	(0.015)	(0.015)
Net number of employed adults	0.226***	0.226***	0.226***	0.226***	0.226***
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Western Cape	0.237***	0.238***	0.239***	0.238***	0.238***
	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)
Eastern Cape	0.119***	0.119***	0.119***	0.121***	0.121***
	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)
Northern Cape	0.060*	0.059*	0.060*	0.062**	0.062**
	(0.031)	(0.031)	(0.031)	(0.031)	(0.031)
Free State	-0.078***	-0.079***	-0.078***	-0.077***	-0.078***
	(0.022)	(0.022)	(0.022)	(0.022)	(0.022)
KwaZulu-Natal	0.134***	0.134***	0.134***	0.134***	0.134***
	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)
North West	0.003	0.002	0.004	0.007	0.006
	(0.023)	(0.023)	(0.023)	(0.022)	(0.022)
Mpumalanga	0.041*	0.041*	0.042*	0.041*	0.040*
	(0.024)	(0.024)	(0.024)	(0.024)	(0.024)
Limpopo	0.292***	0.292***	0.292***	0.295***	0.295***
	(0.029)	(0.029)	(0.029)	(0.029)	(0.029)
Household grant income	-0.032***	-0.032***	-0.032***	-0.032***	-0.032***
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
2012	-0.017	-0.017	-0.017	-0.019	-0.020
	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)
2013	-0.024	-0.024	-0.024	-0.027	-0.027
	(0.020)	(0.020)	(0.020)	(0.020)	(0.020)
2014	-0.079***	-0.079***	-0.079***	-0.082***	-0.082***

			(0.020)			(0.020)			(0.020)			(0.019)			(0.019)
2015			-0.077***			-0.077***			-0.076***			-0.079***			-0.080***
			(0.019)			(0.019)			(0.019)			(0.019)			(0.019)
2016			-0.092***			-0.091***			-0.091***			-0.093***			-0.093***
			(0.019)			(0.019)			(0.019)			(0.019)			(0.019)
2017			-0.128***			-0.128***			-0.129***			-0.129***			-0.128***
			(0.019)			(0.019)			(0.019)			(0.019)			(0.019)
Constant	-2.059***	-1.533***	-1.018***	-2.061***	-1.535***	-1.021***	-2.050***	-1.522***	-1.015***	-2.054***	-1.530***	-1.023***	-2.056***	-1.534***	-1.027***
	(0.058)	(0.070)	(0.076)	(0.058)	(0.070)	(0.076)	(0.058)	(0.070)	(0.076)	(0.057)	(0.070)	(0.075)	(0.057)	(0.070)	(0.075)
F-statistic	2817	936	433	2817	936	433	2812	934	433	2855	940	438	2855	940	437
Prob < F	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Sample	198504	195710	195710	198504	195710	195710	198212	195422	195422	202858	199957	199957	202858	199957	199957
Population	13885895 0	13674070 8	13674070 8	13885895 0	13674070 8	13674070 8	13865199 6	13653683 5	13653683 5	14213969 8	13993263 9	13993263 9	14213969 8	13993263 9	13993263 9

Source: Own Calculations, Pooled GHS 2011-2017.

Note: Standard errors in parenthesis. *** significant at the 1% level, ** significant at the 5% level and * significant at the 10% level. Earnings/income values are measured in thousands of Rands per month and are inflation adjusted with 2017 as the base year.

Table C14: Probit estimation of employment, by disability measure, for adults of working age 16 to 59 years (showing marginal effects for official definition of unemployment)

	Broad			Moderate		Severe			UN			Multiple		
	I	II	III	I	II	I	II	III	I	II	I	II	III	I	II
Disability	0.008	0.007	-0.003	0.014***	0.012**	0.001	-0.032***	-0.028**	-0.030**	-0.027***	-0.017*	-0.021**	-0.022*	-0.003	-0.007
	(0.005)	(0.004)	(0.005)	(0.005)	(0.005)	(0.005)	(0.012)	(0.011)	(0.012)	(0.009)	(0.009)	(0.009)	(0.013)	(0.013)	(0.013)
Age	0.011	0.010	0.010	0.011	0.010	0.010	0.011	0.010	0.010	0.011	0.010	0.010	0.011	0.010	0.010
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Primary		-	-		-	-		-	-		-	-		-	-
		0.038***	0.027***		0.038***	0.027***		0.038***	0.028***		0.038***	0.028***		0.038***	0.028***
		(0.009)	(0.009)		(0.009)	(0.009)		(0.009)	(0.009)		(0.009)	(0.009)		(0.009)	(0.009)
Incomplete secondary		-	-		-	-		-	-		-	-		-	-
		0.034***	0.029***		0.034***	0.029***		0.034***	0.030***		0.034***	0.030***		0.034***	0.030***
		(0.009)	(0.009)		(0.009)	(0.009)		(0.009)	(0.009)		(0.009)	(0.009)		(0.009)	(0.009)
Matric		0.020**	0.025***		0.020**	0.025***		0.020**	0.025***		0.020**	0.024***		0.020**	0.024***
		(0.009)	(0.009)		(0.009)	(0.009)		(0.009)	(0.009)		(0.009)	(0.009)		(0.009)	(0.009)
Tertiary		0.129***	0.108***		0.129***	0.108***		0.129***	0.108***		0.128***	0.107***		0.128***	0.107***
		(0.009)	(0.008)		(0.009)	(0.008)		(0.009)	(0.008)		(0.009)	(0.008)		(0.009)	(0.008)
African		-	-		-	-		-	-		-	-		-	-
		0.218***	0.166***		0.218***	0.166***		0.218***	0.167***		0.218***	0.167***		0.218***	0.166***
		(0.008)	(0.007)		(0.008)	(0.007)		(0.008)	(0.007)		(0.008)	(0.007)		(0.008)	(0.007)
Coloured		-	-		-	-		-	-		-	-		-	-
		0.139***	0.127***		0.139***	0.127***		0.139***	0.127***		0.140***	0.128***		0.140***	0.128***
		(0.011)	(0.011)		(0.011)	(0.011)		(0.011)	(0.011)		(0.011)	(0.011)		(0.011)	(0.011)
Indian		-	-		-	-		-	-		-	-		-	-
		0.082***	0.070***		0.081***	0.069***		0.082***	0.069***		0.084***	0.072***		0.083***	0.072***
		(0.016)	(0.016)		(0.016)	(0.016)		(0.016)	(0.016)		(0.016)	(0.016)		(0.016)	(0.016)
Male		0.067***	0.066***		0.067***	0.067***		0.067***	0.067***		0.067***	0.067***		0.067***	0.067***
		(0.002)	(0.003)		(0.002)	(0.003)		(0.002)	(0.003)		(0.002)	(0.003)		(0.002)	(0.003)
Married or living together			0.068***			0.068***			0.068***			0.068***			0.068***
			(0.003)			(0.003)			(0.003)			(0.003)			(0.003)
Divorced or widowed			0.062***			0.062***			0.062***			0.062***			0.062***
			(0.005)			(0.005)			(0.005)			(0.005)			(0.005)
Urban			0.003			0.003			0.003			0.003			0.003
			(0.004)			(0.004)			(0.004)			(0.004)			(0.004)
Number of			-			-			-			-			-

children 15 and under	0.012***	0.012***	0.012***	0.012***	0.012***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Number of working age adults (16 to 59 years)	- 0.041***	- 0.041***	- 0.041***	- 0.041***	- 0.041***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Number of older adults (60 years +)	- 0.047***	- 0.047***	- 0.047***	- 0.048***	- 0.048***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Net number of employed adults	0.060***	0.060***	0.060***	0.060***	0.060***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
Western Cape	0.061***	0.061***	0.062***	0.062***	0.061***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Eastern Cape	0.031***	0.031***	0.031***	0.032***	0.032***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Northern Cape	0.016*	0.016*	0.016*	0.016**	0.016**
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Free State	- 0.021***	- 0.021***	- 0.021***	- 0.021***	- 0.021***
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
KwaZulu-Natal	0.035***	0.035***	0.035***	0.035***	0.035***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
North West	0.001	0.001	0.001	0.002	0.002
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Mpumalanga	0.011*	0.011*	0.011*	0.011*	0.011*
	(0.006)	(0.006)	(0.006)	(0.006)	(0.006)
Limpopo	0.074***	0.074***	0.074***	0.075***	0.075***
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Household grant income	- 0.009***	- 0.009***	- 0.008***	- 0.009***	- 0.009***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
2012	-0.005	-0.005	-0.005	-0.005	-0.005
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
2013	-0.006	-0.006	-0.006	-0.007	-0.007
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
2014	- 0.021***	- 0.021***	- 0.021***	- 0.022***	- 0.022***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
2015	-	-	-	-	-

	0.021***	0.021***	0.021***	0.022***	0.022***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
2016	-	-	-	-	-
	0.025***	0.025***	0.025***	0.025***	0.025***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)
2017	-	-	-	-	-
	0.035***	0.035***	0.035***	0.035***	0.035***
	(0.005)	(0.005)	(0.005)	(0.005)	(0.005)

Source: Own Calculations, Pooled GHS 2011-2017.
Note: Standard errors in parenthesis. *** significant at the 1% level, ** significant at the 5% level and * significant at the 10% level. Earnings/income values are measured in thousands of Rands per month and are inflation adjusted with 2017 as the base year.

Table C15: Probit estimation of employment, by disability measure, for adults of working age 16 to 59 years (showing coefficients for expanded and official definition of unemployment)

		Broad			Official		
		I	II	III	I	II	III
Sight							
	Moderate	0.133***	0.0976***	0.0450**	0.101***	0.0662***	0.0277
		(0.0186)	(0.0182)	(0.0185)	(0.0203)	(0.0203)	(0.0207)
	Severe	-0.0438	-0.0491	-0.0841*	-0.0718	-0.0803	-0.116**
		(0.0483)	(0.0482)	(0.0471)	(0.0538)	(0.0533)	(0.0526)
Hearing							
	Moderate	-0.109***	-0.0370	-0.0731*	-0.0947**	-0.0395	-0.0824*
		(0.0414)	(0.0432)	(0.0442)	(0.0443)	(0.0465)	(0.0472)
	Severe	-0.172*	-0.162	-0.141	-0.192*	-0.213*	-0.194
		(0.0884)	(0.103)	(0.107)	(0.101)	(0.117)	(0.119)
Physical							
	Moderate	-0.262***	-0.184***	-0.241***	-0.154***	-0.0872	-0.144**
		(0.0508)	(0.0520)	(0.0518)	(0.0591)	(0.0606)	(0.0608)
	Severe	-0.376***	-0.399***	-0.390***	-0.0800	-0.0671	-0.0388
		(0.0841)	(0.0873)	(0.0906)	(0.103)	(0.110)	(0.118)
Communication							
	Moderate	0.405***	0.268**	0.340***	0.113	0.0664	0.0982
		(0.139)	(0.133)	(0.132)	(0.159)	(0.150)	(0.153)
	Severe	0.170	0.0176	0.117	0.158	-0.0306	0.0265
		(0.192)	(0.203)	(0.206)	(0.215)	(0.230)	(0.236)
Cognitive							
	Moderate	-0.325***	-0.139***	-0.134***	-0.212***	-0.0601	-0.0585
		(0.0445)	(0.0459)	(0.0458)	(0.0496)	(0.0512)	(0.0527)
	Severe	-0.438***	-0.172*	-0.103	-0.102	0.0936	0.164
		(0.0866)	(0.0888)	(0.0961)	(0.0975)	(0.0973)	(0.109)
Self-care							
	Moderate	-0.0733	-0.139	-0.0644	0.422**	0.262*	0.340**
		(0.135)	(0.130)	(0.129)	(0.169)	(0.158)	(0.161)
	Severe	-0.312**	-0.367**	-0.253	-0.187	-0.252	-0.127
		(0.156)	(0.152)	(0.164)	(0.184)	(0.179)	(0.192)
Age		0.141***	0.143***	0.121***	0.123***	0.128***	0.105***
		(0.00291)	(0.00285)	(0.00295)	(0.00321)	(0.00317)	(0.00327)
Age Squared		-	-	-	-	-	-
		0.00139***	0.00140***	0.00117***	0.00112***	0.00119***	0.000947***
		(3.86e-05)	(3.83e-05)	(3.94e-05)	(4.25e-05)	(4.25e-05)	(4.38e-05)
Primary			-0.0496	-0.0341		-0.140***	-0.102***
			(0.0314)	(0.0307)		(0.0336)	(0.0341)
Incomplete secondary			0.0501	0.0193		-0.129***	-0.110***
			(0.0317)	(0.0303)		(0.0331)	(0.0335)
Matric			0.315***	0.262***		0.0746**	0.0923***
			(0.0329)	(0.0315)		(0.0345)	(0.0348)
Tertiary			0.804***	0.655***		0.500***	0.432***
			(0.0349)	(0.0333)		(0.0365)	(0.0367)
African			-0.935***	-0.687***		-0.873***	-0.677***
			(0.0317)	(0.0295)		(0.0354)	(0.0332)
Coloured			-0.557***	-0.470***		-0.512***	-0.451***
			(0.0363)	(0.0341)		(0.0401)	(0.0382)
Indian			-0.287***	-0.217***		-0.299***	-0.248***
			(0.0512)	(0.0481)		(0.0581)	(0.0549)
Male			0.325***	0.315***		0.253***	0.249***
			(0.00869)	(0.00913)		(0.00915)	(0.00966)
Married or living together				0.243***			0.252***
				(0.0107)			(0.0115)
Divorced or widowed				0.224***			0.242***
				(0.0181)			(0.0200)
Urban				0.130***			0.00985
				(0.0141)			(0.0160)
Number of children 15 and under				-0.0489***			-0.0447***
				(0.00596)			(0.00646)

Number of working age adults (16 to 59 years)			-0.146***			-0.153***
			(0.00400)			(0.00443)
Number of older adults (60 years +)			-0.152***			-0.176***
			(0.0136)			(0.0150)
Net number of employed adults			0.215***			0.226***
			(0.00776)			(0.00823)
Western Cape			0.202***			0.239***
			(0.0218)			(0.0242)
Eastern Cape			0.0505**			0.119***
			(0.0205)			(0.0227)
Northern Cape			0.0209			0.0600*
			(0.0276)			(0.0309)
Free State			-0.110***			-0.0774***
			(0.0205)			(0.0223)
KwaZulu-Natal			0.0788***			0.134***
			(0.0175)			(0.0199)
North West			-0.00136			0.00315
			(0.0205)			(0.0228)
Mpumalanga			0.0932***			0.0425*
			(0.0210)			(0.0243)
Limpopo			0.199***			0.292***
			(0.0247)			(0.0292)
Household grant income			-0.0614***			-0.0316***
			(0.00943)			(0.00964)
2012			-0.243***			-0.0176
			(0.0186)			(0.0198)
2013			-0.271***			-0.0239
			(0.0186)			(0.0199)
2014			-0.319***			-0.0795***
			(0.0185)			(0.0197)
2015			-0.318***			-0.0765***
			(0.0177)			(0.0189)
2016			-0.329***			-0.0916***
			(0.0180)			(0.0192)
2017			-0.337***			-0.129***
			(0.0177)			(0.0188)
Constant	-2.560***	-2.173***	-1.474***	-2.057***	-1.530***	-1.016***
	(0.0523)	(0.0646)	(0.0693)	(0.0579)	(0.0702)	(0.0757)
Observations	512,304	509,309	509,309	512,778	509,992	509,992

Source: Own Calculations, Pooled GHS 2011-2017.

Note: Standard errors in parenthesis. *** significant at the 1% level, ** significant at the 5% level and * significant at the 10% level. Earnings/income values are measured in thousands of Rands per month and are inflation adjusted with 2017 as the base year.

Table C16: Probit estimation of employment, by disability measure, for adults of working age 16 to 59 years (showing marginal effects for expanded and official definition of unemployment)

		Broad			Official		
		I	II	III	I	II	III
Sight							
	Moderate	0.039***	0.026***	0.013**	0.0286***	0.0176***	0.00742
		(0.005)	(0.005)	(0.005)	(0.00576)	(0.00540)	(0.00554)
	Severe	-0.013	-0.013	-0.024*	-0.0203	-0.0214	-0.0310**
		(0.014)	(0.013)	(0.013)	(0.0152)	(0.0142)	(0.0141)
Hearing							
	Moderate	-0.032***	-0.010	-0.021*	-0.0268**	-0.0105	-0.0221*
		(0.012)	(0.011)	(0.013)	(0.0125)	(0.0124)	(0.0126)
	Severe	-0.051*	-0.043	-0.040	-0.0543*	-0.0566*	-0.0521
		(0.026)	(0.027)	(0.030)	(0.0285)	(0.0313)	(0.0318)
Physical							
	Moderate	-0.077***	-0.049***	-0.068***	-0.0437***	-0.0232	-0.0385**
		(0.015)	(0.014)	(0.015)	(0.0168)	(0.0161)	(0.0163)
	Severe	-0.111***	-0.106***	-0.111***	-0.0227	-0.0179	-0.0104
		(0.025)	(0.023)	(0.026)	(0.0292)	(0.0294)	(0.0317)
Communication							
	Moderate	0.119***	0.071**	0.097***	0.0321	0.0177	0.0263
		(0.041)	(0.035)	(0.037)	(0.0451)	(0.0400)	(0.0409)
	Severe	0.050	0.005	0.033	0.0449	-0.00815	0.00711
		(0.057)	(0.054)	(0.059)	(0.0608)	(0.0611)	(0.0632)
Cognitive							
	Moderate	-0.096***	-0.037***	-0.038***	-0.0601***	-0.0160	-0.0157
		(0.013)	(0.012)	(0.013)	(0.0141)	(0.0136)	(0.0141)
	Severe	-0.129***	-0.046*	-0.029	-0.0288	0.0249	0.0438
		(0.025)	(0.024)	(0.027)	(0.0276)	(0.0259)	(0.0292)
Self-care							
	Moderate	-0.022	-0.037	-0.018	0.120**	0.0697*	0.0910**
		(0.040)	(0.034)	(0.037)	(0.0481)	(0.0420)	(0.0430)
	Severe	-0.092**	-0.097**	-0.072	-0.0531	-0.0672	-0.0341
		(0.046)	(0.040)	(0.047)	(0.0520)	(0.0475)	(0.0515)
Education:							
Primary			-0.013	-0.010		-0.0373***	-0.0273***
			(0.008)	(0.009)		(0.00893)	(0.00912)
Incomplete Secondary			0.013	0.005		-0.0344***	-0.0293***
			(0.008)	(0.009)		(0.00883)	(0.00895)
Matric			0.084***	0.075***		0.0199**	0.0247***
			(0.009)	(0.009)		(0.00916)	(0.00931)
Tertiary			0.213***	0.186***		0.133***	0.116***
			(0.009)	(0.009)		(0.00967)	(0.00984)
Demographic							
Age		0.012	0.011	0.010	0.011	0.010	0.010
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Male			0.086***	0.090***		0.0674***	0.0668***
			(0.002)	(0.003)		(0.00242)	(0.00259)
African			-0.248***	-0.195***		-0.232***	-0.181***
			(0.008)	(0.008)		(0.00925)	(0.00876)

Coloured	-0.148***	-0.134***	-0.136***	-0.121***
	(0.010)	(0.010)	(0.0106)	(0.0102)
Indian	-0.076***	-0.062***	-0.0797***	-0.0665***
	(0.014)	(0.014)	(0.0154)	(0.0147)
Married or living together		0.069***		0.0675***
		(0.003)		(0.00309)
Divorced or widowed		0.064***		0.0648***
		(0.005)		(0.00536)
Location:				
Urban		0.037***		0.00264
		(0.004)		(0.00429)
Western Cape		0.057***		0.0640***
		(0.006)		(0.00649)
Eastern Cape		0.014**		0.0318***
		(0.006)		(0.00609)
Northern Cape		0.006		0.0161*
		(0.008)		(0.00827)
Free State		-0.031***		-0.0207***
		(0.006)		(0.00596)
KwaZulu-Natal		0.022***		0.0359***
		(0.005)		(0.00534)
North West		-0.000		0.000844
		(0.006)		(0.00610)
Mpumalanga		0.026***		0.0114*
		(0.006)		(0.00652)
Limpopo		0.056***		0.0783***
		(0.007)		(0.00780)
Household Characteristics:				
Number of children 15 and under		-0.014***		-0.0120***
		(0.002)		(0.00172)
Number of working age adults (16 to 59 years)		-0.041***		-0.0410***
		(0.001)		(0.00114)
Number of older adults (60 years +)		-0.043***		-0.0472***
		(0.004)		(0.00404)
Net number of employed adults		0.061***		0.0604***
		(0.002)		(0.00216)
Household grant income		-0.017***		-0.00847***
		(0.003)		(0.00258)
Year of survey:				
2012		-0.069***		-0.00470
		(0.005)		(0.00530)
2013		-0.077***		-0.00641
		(0.005)		(0.00534)
2014		-0.091***		-0.0213***
		(0.005)		(0.00527)
2015		-0.090***		-0.0205***
		(0.005)		(0.00506)
2016		-		-0.0245***

	0.093***	
	(0.005)	(0.00514)
2017	-	-0.0346***
	0.096***	
	(0.005)	(0.00503)

Source: Own Calculations, Pooled GHS 2011-2017.
Note: Standard errors in parenthesis. *** significant at the 1% level, ** significant at the 5% level and * significant at the 10% level. Earnings/income values are measured in thousands of Rands per month and are inflation adjusted with 2017 as the base year.

Table C17: An OLS model showing the relationship between disability and earnings for adults of working age (16 – 59), by disability type

		Specification		
		I	II	III
Sight				
	Moderate	0.179***	0.0549***	0.0360**
		(0.0251)	(0.0154)	(0.0151)
	Severe	0.0400	0.0330	0.0274
		(0.0653)	(0.0372)	(0.0375)
Hearing				
	Moderate	-0.278***	-0.0927***	-0.0811**
		(0.0513)	(0.0354)	(0.0348)
	Severe	-0.394***	-0.212**	-0.183**
		(0.127)	(0.0909)	(0.0882)
Physical				
	Moderate	-0.425***	-0.144***	-0.143***
		(0.0579)	(0.0415)	(0.0406)
	Severe	-0.0164	-0.0325	-0.0350
		(0.123)	(0.0830)	(0.0862)
Communication				
	Moderate	0.629***	0.372***	0.382***
		(0.201)	(0.129)	(0.125)
	Severe	0.367	0.230	0.192
		(0.229)	(0.161)	(0.164)
Cognitive				
	Moderate	-0.699***	-0.210***	-0.199***
		(0.0570)	(0.0438)	(0.0434)
	Severe	-0.880***	-0.191***	-0.182***
		(0.0960)	(0.0635)	(0.0649)
Self-care				
	Moderate	0.379*	0.0449	0.0254
		(0.203)	(0.137)	(0.130)
	Severe	0.0378	-0.0920	-0.108
		(0.358)	(0.306)	(0.311)
Education:				
Primary			0.147***	0.139***
			(0.0221)	(0.0213)
Incomplete Secondary			0.470***	0.408***
			(0.0218)	(0.0213)
Matric			0.950***	0.860***
			(0.0226)	(0.0223)
Tertiary			1.694***	1.591***
			(0.0241)	(0.0236)
Demographics:				
Age		0.0752***	0.0408***	0.0392***
		(0.00401)	(0.00258)	(0.00252)
Age Squared		-0.000795***	-0.000341***	-0.000325***
		(5.22e-05)	(3.31e-05)	(3.23e-05)
Female			-0.288***	-0.279***
			(0.00715)	(0.00691)
African			-0.727***	-0.672***
			(0.0168)	(0.0172)
Coloured			-0.528***	-0.476***
			(0.0199)	(0.0202)
Indian			-0.136***	-0.130***
			(0.0308)	(0.0309)
Married or living together			0.196***	0.177***
			(0.00873)	(0.00869)

Divorced or widowed		0.0403***	0.0469***
		(0.0137)	(0.0134)
Formal		0.696***	0.686***
		(0.0104)	(0.0101)
Location:			
Urban			0.262***
			(0.0126)
Western Cape			-0.143***
			(0.0159)
Eastern Cape			-0.344***
			(0.0183)
Northern Cape			-0.283***
			(0.0246)
Free State			-0.272***
			(0.0194)
KwaZulu-Natal			-0.162***
			(0.0164)
North West			-0.0671***
			(0.0188)
Mpumalanga			-0.0700***
			(0.0217)
Limpopo			-0.124***
			(0.0203)
Year of survey:			
2012			0.0126
			(0.0149)
2013			0.00880
			(0.0156)
2014			-0.0114
			(0.0153)
2015			0.0133
			(0.0135)
2016			0.0127
			(0.0139)
2017			0.00667
			(0.0135)
Constant	6.768***	6.644***	6.636***
	(0.0732)	(0.0557)	(0.0575)
Observations	487,014	485,602	485,602
R-squared	0.022	0.450	0.468

Source: Own Calculations, Pooled GHS 2011-2017.

Note: Standard errors in parenthesis. *** significant at the 1% level, ** significant at the 5% level and * significant at the 10% level. Earnings/income values are measured in thousands of Rands per month and are inflation adjusted with 2017 as the base year.

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Dear Ms Tamlyn Candyce Mckenzie,

Protocol reference number: 00004169
Project title: Childhood and adult disability: impacts on education and the labour market in South Africa

Exemption from Ethics Review

In response to your application received on 30 September 2019, your school has indicated that the protocol has been granted **EXEMPTION FROM ETHICS REVIEW.**

Any alteration/s to the exempted research protocol, e.g., Title of the Project, Location of the Study, Research Approach and Methods must be reviewed and approved through an amendment/modification prior to its implementation. The original exemption number must be cited.

For any changes that could result in potential risk, an ethics application including the proposed amendments must be submitted to the relevant UKZN Research Ethics Committee. The original exemption number must be cited.

In case you have further queries, please quote the above reference number.

PLEASE NOTE:
Research data should be securely stored in the discipline/department for a period of 5 years.

I take this opportunity of wishing you everything of the best with your study.

Yours sincerely,

[redacted] 16 October 2019

Prof Josue Mbonigaba
Academic Leader Research
School Of Acc Economics&Fin