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DISABILITY IN GAUTENG, SOUTH AFRICA: LEVELS, DISTRIBUTION, GRANT ALLOCATION AND PREDICTORS (2007)

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A research report submitted to the Faculty of Health sciences, University of the Witwatersrand, Johannesburg, in partial fulfillment of the requirements for the degree of Master of Science in Epidemiology & Biostatistics

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DECLARATION

I, Mpinda Beya, hereby declare that this research report is my own work. It is being submitted for the degree of Master of Science in Epidemiology in the field of Epidemiology and Biostatistics at the University of Witwatersrand, Johannesburg. It has not been previously submitted entirely or partially for examination at this or any other University.

Signature: ..... 7 October 2014

Mpinda Beya

DEDICATION

I dedicate this work to my parents, Joseph Mpinda and Milolo Rosalie, and my beloved wife, Francoise Mbombo.

To my adorable children: Keren, Boanerges, Gloire and Sharon.

ABSTRACT

Introduction

Disability is a major public health concern worldwide. The situation in Africa is serious. It is estimated that ten percent of the world's population is living with a disability and close to two-thirds of all people with a disability live in low-income countries. The main objective of this study was to determine the spatial distribution of disability and disability grant allocation and to identify factors associated with disability within the Gauteng Province (2007).

Materials and Methods

An analytical cross-sectional study design was used to analyse secondary data from the 2007 South African survey data. The population of Gauteng was the focus of the study. The prevalence of disability in Gauteng was estimated. Chi-square test of proportions was used to analyse the distribution of social and demographic characteristics among participants.

Poisson regression models were constructed to determine the association between disability and socio-demographics characteristics.

Results

Of a sample of 133 691 individuals in Gauteng Province, 4 492 (3.4%) reported being disabled, and of these, 2 333 (51,94%) were male and 2159 (48,06%) were female. The overall prevalence of disability or disability rate was 3.4%.

Most of the disabled people were older individuals aged 40 to 64 years (51,51%), followed by those aged 18 to 39 years (33,17%); the rest were individuals aged over 64 years of age (retirement age category).

Most of these disabled participants were black (77,8%), with whites contributing 15,69%. Almost half (42,72%) of the disabled participants were never married. More than half of the disabled participants (59,75%) had a high school level of education, followed by those with primary school as their level of education (25,31%). Almost 18% of the disabled people were employed and the remaining percentage was unemployed (82%). More than half of the disabled population in Gauteng resided in Johannesburg (34,93%) and Ekurhuleni (26,89%), followed by Tshwane (19.08%).

There was a statistically difference in disability grant allocation between the disabled males (51,34%) and (48,66%) females. About 67,93% of the disability grant was given to the older working age category (40-64 years). More than 80% of the disability grants support was issued to the black population group. More than 45 % of the disability grants support issued was given to people who had never married. More than 80% of the disability grants issued was given to the non-economically active category of disabled people. More than 60% of the disability grants support went to those in Johannesburg, Tshwane and Ekurhuleni.

Variables associated with disability in Poisson regression analysis included the following:

Female participants in the study showed a lower risk (40%) of disability compared to males, and this difference was statistically significant (IRR 0.6, CI 0.59-0.67, p= <0.001).

The older working age category (39 to 64 years) (IRR2.9, CI 2.6-3.1, p=<0001) and retirement age category (65 years and above) (IRR 3.0, CI 2.5-3.5, p=<0.001) were respectively associated with a higher risk of disability.

Coloured (IRR 1.37,CI 1.2-1.6, p <0.001) and white (IRR 1.41, CI 1.3-1.6, p<0.001) participants showed a 1.4 times greater risk of having disability compared to individuals of the black community, and these differences were statistically significant. While Indians (IRR 1.13, CI 0.9-1.4, p=0.247) had 1.1 times the risk of having disability compared to black participants but the difference was not statistically different.

The risk of disability in individuals living in Tshwane (IRR 0.87,CI 0.80-0.95, p=0.001) and the West Rand (IRR 0.86,CI 0.75-0.99, p=0.037) districts was lower by 10% relative to individuals staying in the city of Johannesburg. This risk was relatively lower by 20% in Metsweding (IRR 0.77,CI 0.63-0.94, p=0.012) compared to Johannesburg. These differences were statistically significant. On the other hand, although not significant, the risk of disability was higher by 7% in Sedibeng district (IRR 1.07,CI 0.97-1.18, p=0.187).

Participants in a traditional marriage (IRR 1.1, CI 0.97-1.24, p =0.14) and those who were polygamous (IRR 1.0, CI 0.33-3.21, p= 0.96) were not associated with disability compared to civil/ religiously married participants. Others categories of marital status included living together as married (IRR 1.2, CI 1.06-1.37, p=0.006); never married (IRR 1.6, CI 1.49-1.78, p< 0.001); widow/widower (IRR 1.4, CI 1.2-1.6, p <0.001); separated (IRR 1,6, CI1.34-2.08, p<0.001 and divorced (IRR 1.9,CI 1.65-2.24, p<0.001) were associated with disability and the observed differences were statistically significant.

Those who had attended high school (IRR 0.48, CI 0.44-0.53, p <0.001) and those who had post matric studies (higher school)(IRR 0.34, CI 0.27-0.42, p< 0.001) were less associated with disability compared to those who only had a primary school level of education (IRR 0.8, CI 0.76-0.93, p = 0.001).

Participants classified as not economically active were 7.5 times at risk of being disabled (IRR 7.5, CI6.95-8.19, p < 0.001). The observed difference was statistically significant.

The least poor households were 0.7 times at risk of having a disabled member (IRR 0.7, CI 0.62-0.75, p <0.001) while the poor households had a 0.9 times the risk of having a family member with any disability (IRR 0.9, CI 0.81-0.94, p <0.001) - compared to most poor households, and the difference was statistically significant.

Conclusion

Gauteng showed a prevalence of individuals living with a disability in South Africa. In fact, it was found that the overall prevalence of disability in the Gauteng Province was 3,6%. During the same period Statistics South Africa estimated the whole county disability rate to be 4%. Statistically significant risk factors associated with disability in Gauteng included males aged 39 years and older; the coloured and white population group; living in the Sedibeng district; living together as married, never married, widower/widow, separated and divorced; not educated; not economically active; and most poor households. The spatial distribution of grant allocation was proportional to the disability burden per district as well as well as per local municipality, with a statistically significant relationship between disability burden and grants allocation. A higher proportion of males disabled received a grant compared to disabled females. Sedibeng district was highly associated with any disability, whilst Metsweding was the safest district.

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Last, but not the least, I thank God who made me King and Priest through my Saviour and Lord Jesus Christ for all sort of blessings and favours.

To all of you, I am really grateful.

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$\chi^2_{(a)}$

χ^2 : chi-square

$_{(a)}$: degree of freedom a

ACRONYMS

AIDS - Acquired Immunodefiency Syndrome

AMA - American Medical Association

ART - Anti-Retroviral Therapy

ICF - International Classification of Functioning, Disability and Health

IRR - Incidence Relative Risk

HIV - Human Immunodeficiency Virus

HIV/AIDS - Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome

SA - South Africa

SASSA - South African Social Security Agency.

UNAIDS - United Nations Programme on HIV and AIDS

WHO - World Health Organization

CHAPTER 1: INTRODUCTION

This chapter gives background information on the burden of disability worldwide, in Africa and in South Africa. The chapter also contains a statement of the problem, justification for the study, a review of literature from relevant publications and objectives for the current study.

1.1 Background

Disability is a major public health concern worldwide. It is estimated that ten percent of the world's population, or approximately 700 million people, are living with a sensory, physical or intellectual disability (1) and close to two-thirds of all people with disabilities live in low-income countries (1, 2). Public health data reveal that the number of adults living with disabilities continues to increase and the national disability prevalence rates reported from around the world differ dramatically(3). This is a very important issue, because it is estimated that 10% of the world population have their daily activities restricted because of physical and/or mental and/or sensory disability (4). In 2005, the Centers for Disease Control and Prevention declared that nearly 50 million American adults aged 18 years and older were affected by disabilities (Centers for Disease Control and Prevention, 2005). As for Europe and Asia, the regional disability prevalence is said to be 4-10% of the general population(5).

In Africa, as well as in many low-income countries, the national disability prevalence rates have been reported to be lower than 5% compared to some western countries where it is sometimes indicated to be as high as 20% (6). It is even alleged that the reported low prevalence rate maybe a sign of low survival rates among the disabled, which in turn are an indication of poor health and other factors (7).

In 2005, Barrett and Tikly (2010) established that there were 50 million disabled people in sub-Saharan Africa(8). Elwan (1999) and Emmet (2006) established that, worldwide, disabled persons are at a disadvantage as far as access to education and employment opportunities are concerned(9, 10). In South Africa, approximately 16% of households have a disabled member (11). Since 1994, a different plan of action exists, which addresses the issue of disadvantaged groups especially the disabled (12, 13).

1.2 Problem statement

In 1993, the United Nations deplored the condition of the majority of people living with disabilities worldwide (14). It has been reported that people with disabilities in the countries of Europe and Eurasia, particularly people with a mental or psychiatric disability, have a long history of being sent to long-term residential facilities, orphanages, or institutions for people with disabilities, where conditions are shocking and frequently violate basic human rights(15).

In the United States of America, Australia, Canada and the United Kingdom, public programs address long-term strategic procedures, helping applicants in various stages of the disability determination processes to reduce delays and other barriers in accessing the disability support pension (16).

Niño-Zarazúa et al. described a number of social protection programs that have shown/emerged since the mid-1990s, with significant expansion in sub-Saharan Africa(17).

In South Africa, the Constitution has provisions for the rights of social protection to everyone, including people who are unable to support themselves and/or their dependents by providing appropriate social assistance (Social Assistance Act 13 of 2004, Section 9). A study done in South Africa observed that the country has a relatively generous disability grant program(18), while another study qualified the South African disability grant program as being the best policy/constitution in targeting poverty around the world(19). In a study done in the rural Eastern Cape and urban areas in the Western Cape, Jelsma et al., (2008), found that disabled persons, males as well as females, in urban and rural areas, were receiving disability grant support(20). However, the prevalence of disability and its associated factors as well as the disability grant allocation is not well established in Gauteng.

1.3 Justification for the study

Around the world, policies and services for people living with disabilities are being put in place to assert their rights and tackle barriers to their social inclusion, independence and empowerment(21, 22).To alleviate the suffering of disabled persons, several countries have cash transfer schemes targeting persons with disabilities(23-28). This is also the case in South Africa where working-age adults who are unable to work due to their disabilities are granted a monthly cash allowance(29).

In India, estimates suggested that less than 10 per cent of all persons with disabilities receive the disability pension (30). In 1995, in Namibia, it was observed that only 25% of persons with disabilities were recipients of the 'universal' disability grant (27).

In a study to establish whether there was a difference in the characteristics of people who received a disability grant and those who did not in rural and urban samples of isiXhosa-speaking people with disability in South Africa, Jelsma (et al., 2008) concluded that the disability grants issued were reaching disabled people, whether or not they lived in remote rural or in an urban area(20).To our knowledge there is no study in South Africa that describes the spatial distribution of disability and correlates it with disability grant allocation. This study will determine if there are districts/sub-districts within Gauteng with a high prevalence of disability and whether or not there is a correlation between a disability burden and spatial distributions of the allocation of disability grants.

The evidence obtained from the findings of this study will be made available, where appropriate, to help inform policy-makers, to prioritise, as well as to inform the process of planning and implementation of disability programs in the different districts of Gauteng.

1.4 Literature review

This section represents a review of the recent literatures on disability and disability grant.

Its contains the following:

- Definition of concepts,
- An overview of the burden of disability,
- Types of disability,
- Causes of disability,
- Factors associated with disability, and
- Social support and the disability grant

1.4.1 Definition of concepts

Disability, impairment and disability grant are defined as following:

1.4.1.1 Disability

Disability is the alteration of an individual's capability to meet his/her personal, social or occupational demands due to impairment, and is assessed by non-medical means(31). Similarly, Statistics South Africa defined disability as:

> "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(18, 19, 32, 33).

According to the South African Social Assistance Amendment Bill (2010) amending the social assistance Act number 13 of 2004, section 9 (b), a person is eligible for a disability grant if he/she is, owing to a physical or mental disability, unfit to obtain by virtue of any service, employment or profession the means needed to enable him/her to provide for his or her maintenance.

1.4.1.2 Impairment

Impairment is the alteration of the normal functional capacity of the body and/or mind. It is determined by medical (or clinical) means. After a diagnosis has been established and the appropriate and optimal treatment applied, a person may be assessed to have a physical or mental impairment.

1.4.1.3 Disability grant

A disability grant is a monthly payment given by the government to any adult (18years or older), citizen or permanent resident of South Africa and living in South Africa at the time of applying for the grant, who is not able to work because of mental or physical disability. When the disabled person is less than 18 years old, the parent or guardian applies for a grant called a Care Dependency Grant.

1.4.2 Worldwide overview of the burden of disability

Globally, more than 650 million people have a disability of one form or another. According to the World Health Organization (WHO) and the World Bank, two thirds of the disabled population live in developing countries where it is said that most have been neglected and marginalised by the state and society(34). It is estimated that by the year 2025, the number of people with disabilities in low-income countries will double (35).

According to Barrett and Tikly (8), there were 50 million disabled people living in sub-Sahara Africa in 2005.In South Africa, the prevalence of disability was estimated to be between 5 and 5.9% (36) of the population. The 2007 South African Community Survey estimated the prevalence of disability to be 4% of the total population, suggesting a decrease in the prevalence of disability in South Africa since 2004 (32).

1.4.3 Disability types

Types of disability are wide-ranging. These include cognitive, visual, auditory impairments (37), chronic musculoskeletal abnormalities(38), physical mobility disturbances (39), sleep-and movement related disorders (37), and limitations in the activities of daily living (AIDL) (37).

1.4.4 Causes of disability

In a 29-country African study done by WHO in 2010, it was reported that the most common/frequent causes of disability were infectious disease; malaria, polio and leprosy. It has been established that a number of infections (rubella, syphilis, human immunodeficiency virus, meningitis, encephalitis, trachoma, cerebral malaria, otitis media, polio and leprosy) can result in damage to the developing nervous system and cause long-term disabilities in children (Committee on Nervous System Disorders in Developing Countries, 2001). The World Health Organization estimated that infectious diseases account for 9% of years lived with disability in low-income and middle-income countries(34).

It is believed that as shown by several studies, the increase in non-communicable diseases worldwide has had a profound effect on disability. The World Health Organization and several studies estimated that non-communicable diseases account for 66% of all years lived with disability in low-income and middle-income countries (34, 40-43).

Micronutrient deficiencies are also described to be amongst the leading causes of developmental disabilities. Several studies estimate that a vitamin A deficiency causes 70% of the estimated half a million new cases of blindness or partial blindness occurring in children each year (44-46).

Hetzel believed that iodine deficiency is the leading cause of preventable mental retardation in many developing countries (47-49). A recent study in Chile suggests that iron deficiency may also have a direct effect on the developing nervous system during infancy(50, 51).

With regard to genetic factors, Obama (et al., 1994) observed that up to 3% of children were affected by serious, inherited haemoglobinopathies such as sickle cell anemia and thalassemia in West Africa, with an increased risk of strokes, meningitis, and neurodevelopmental sequelae (52). According to the World Health Organization (1985), the prevalence of Downs Syndrome was up to three times greater in countries where the proportion of births to women over age 35 is elevated because of an absence or unsuccessful contraception, family planning, and prenatal screening.

Consanguinity, also linked to increased disabling childhood conditions and deleterious mutations, is known to be prominent in some population in developing countries (53-57).

War, trauma or accidents, i.e. mostly road accidents, were the second major cause of disability, while congenital abnormalities (cerebral palsy, for example) and non-infectious diseases such as epilepsy were reported to be the third most common cause of disability (1).

1.4.5 Factors associated with disability

Various barriers that prevent disabled people from access to services have been identified. Emmett and Alant acknowledged that the interaction between poverty, gender, race and disability were responsible for social inequality(58). Also, Zitko Melo and Cabieses Valdes (59) found that the classic measures of socioeconomic positions (income, education, and occupation) were consistently associated with any form of disability. Thus, poverty has also been associated with an increase in the prevalence of disability through inadequate nutrition, sanitation and health care (60).

It has been observed that persons with disabilities belong to the poorest segments of society (UN, 1996), and other studies qualified the“ bi-directional ” relationship, namely the relation between

disability and poverty, as poverty often leads to disability and disability often leads to poverty (34, 61, 62).

In a review of international literature on poverty and disability, Elwan concluded that persons with disabilities are more likely to be unemployed, and poorer than the rest of the population in developed as well as developing countries(63). It has also been established, with regard to employment, in a large majority of studies, that disability may prevent work or constrain the nature and amount of work that a person can do, resulting in people with disabilities less likely to be employed(63-68). In surveys of work in the United Kingdom, the United States of America, Canada and Australia, people living with disabilities were found to be under-employed compared to their level of training, they received a low income and less chance of promotion (10, 63). Moreover, in a cross-country study of 13 developing countries, Filmer (2008) found that disability in adulthood is associated with a higher probability of living in poverty(69).

As for education, several studies have shown that children with disabilities tend to remain indoors compared to children of the same age without disabilities (6, 64, 70-73). Looking at the educational attainment among adults, the same studies found consistent evidence that adults with disabilities have lower educational attainment. Similarly, a study done in the North West Province of Cameroon found that persons with disabilities generally have lower levels of education than the general population (74).

Describing the situation of women with disabilities in Lusaka, Zambia, Smith et al. (75) confirmed that women with disabilities were denied access to safe motherhood and reproductive health services. In1988, a report to the commission of the European community on the vocational rehabilitation of disabled women in the European community stated that disabled women had less access to health care and rehabilitation services, fewer educational and employment opportunities, and little hope of marriage (76). Therefore, they appear to be more vulnerable to physical and mental abuse.

As with the general population, substance abuse is also a serious issue for persons with disabilities (77). Some international studies suggest that people with disabilities may be at increased risk of abusing substances (78-80). In a study of South African youth with physical

disabilities following spinal cord injuries, it was reported that substances were used as a way of coping with the frustration of adjusting to a new identity as a physically disabled person (81).

1.4.6 Social support and the disability grant

There is overwhelming evidence documenting the positive effects of social support of disabled people by the general population (82-85). Unlike many developing countries, South Africa has a well-developed system of social security where social assistance is provided in the form of different programs: Disability Grant, Grant for Older Persons, Care Dependency Grant, War Veteran's Grant, Grant in Aid, Child Support Grant, Foster Child Grant, and Social Relief of Distress (86, 87). It is alleged that such interventions do much to alleviate the social and economic impact of disability on the disabled person and his/her household (88). In South Africa, over 13 million South Africans receive one or more forms of social assistance benefits. This number accounts for more than 27% of the entire population (89). Hall and Monson (90) found that in a poor urban site in the Western Cape and a poor rural site in the Eastern Cape, only two-thirds of eligible children were accessing the grant. Jelsma et al. found, on the contrary, that the issuing of disability grants was reaching the majority of people with disabilities (20).

1.5 Objectives

The following were the objectives of this study:

1. To estimate the prevalence of disability in different sub-districts of Gauteng in 2007.
2. To determine the spatial distribution of the disability burden in Gauteng in 2007.
3. To determine the spatial distribution of disability grant allocation and how this related with the disability burden in Gauteng in 2007.
4. To determine the factors that were associated with disability burden in the Gauteng Province in 2007.

CHAPTER 2: MATERIALS AND METHODS

This chapter describes the study design, setting, study population and sample. It also describes measurements, data management and the statistical methods used. The chapter ends by stating the ethical considerations used in conducting the study.

2.1 Study design

This was an analytical cross-sectional analysis of secondary data from the Gauteng 2007 Community survey (dataset).

2.2 Study area

The focus of the study was on the Gauteng province in South Africa. Although the smallest of nine provinces, Gauteng is said to be the heart of the South African commercial business and industrial sectors. IsiZulu, Afrikaans, Sesotho and English are the main languages spoken in the province> the province is sub-divided into 6 districts: City of Johannesburg Metropolitan municipality, City of Tshwane Metropolitan municipality, Ekurhuleni Metropolitan municipality, Metsweding District municipality, Sedibeng District municipality and the West Rand District municipality. It is further sub-divided into 25 sub-districts. The research was done at district and sub-district level.

2.3 Study population

The study population was made of individuals of Gauteng, as enumerated in the 2007 Community Survey Data set, as reported by Statistics South Africa (Stats SA).

2.4 Study sample

Since independence, South Africans were counted for the third time in 2007. Over 83,000 enumerators and over 17,000 supervisors and fieldwork coordinators were employed to collect information on persons and households throughout the country. The study sample consisted of individuals of Gauteng aged 18 years and over, as recorded in the 2007 Community Survey in South Africa. Enumerators visited every household and interviewed a household representative, or left the questionnaire for the household to complete. The survey covered a range of

demographic, social and economic topics. Questions in the questionnaire applied to each individual in the household, as well as to the circumstances of the household as a whole. Data related to disability and disability grants were the focus of the present study. The following is the overall distribution of the study sample.

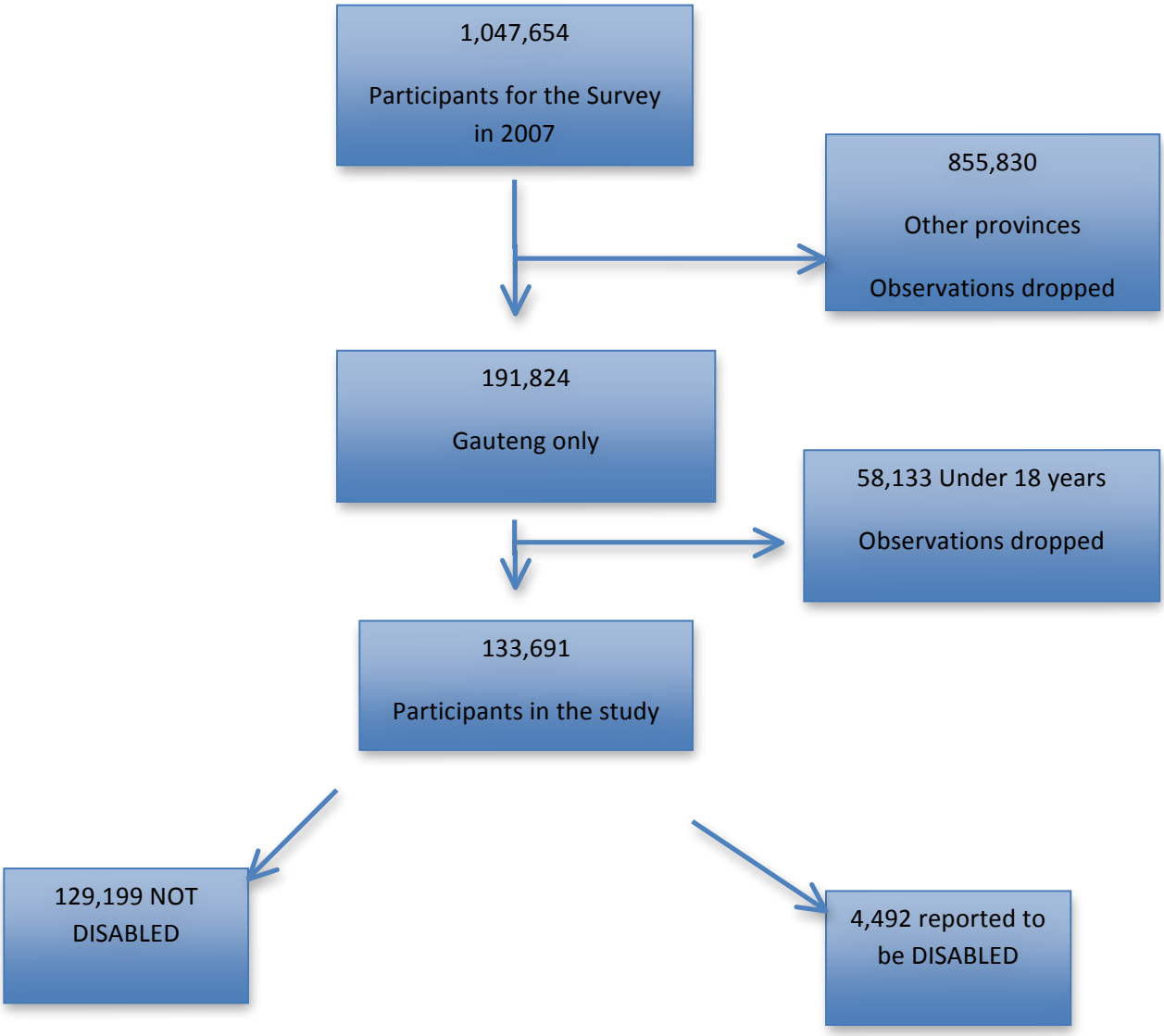

Figure 1: Distribution of the study sample

2.4.1 Inclusion and exclusion criteria

All individuals aged 18 years and over and listed in the South African 2007 Community Survey within the geographical limits of Gauteng Province were included in the study. Those who were below 18 years of age and/or not found under the limits of Gauteng according to the 2007 Community Survey, were not counted for the present study.

2.5 Data sources

The 2007 Community Survey covered 274,348 dwelling units or households across all the provinces. Field workers, trained by Stats SA, who were organised in teams of five, comprising one supervisor and four field enumerators, visited the households sampled. A questionnaire was used. A total of 238,067 dwellings had completed questionnaires when the fieldwork ended.

The 2007 Community Survey had three subsets of data collection-individual-household and geographical areas. The questionnaires were processed using scanning technology to capture the data. (Stats SA, 2007). Demographic, social, economic and geographical data were extracted from the 2007 Community Survey datasets for the purpose of this study.

The 2007 Community Survey provided an opportunity to ascertain the number of disabled persons, their demographic and socio-economic characteristics and their access to basic services. This study displayed the levels and distribution of disabilities, grant allocations and different predictors of disabilities in the different district and sub-districts within the Gauteng Province in 2007.

2.6 Measurements

The following section summarizes how key variables used in this study where measured in the 2007 community survey.

2.6.1 Study variables and definitions

The dataset used had the following: age, sex, marital status, population group (race), disability, disability type, social grant, type of social grant, level of education, employment status, income, and names of sub-district and district municipalities. Ownership of a refrigerator, radio,

television, computer, landline telephone, Internet facilities at home and post facilities were considered as the household variables.

2.6.1.1 Explanatory factors/variables

The following explanatory variables were defined and measured in this study:

- Age: defined as age of the participant translated in completed years (i.e. age at the last birthday). All participants of less than 18 years were excluded from the study. Age groups were defined in three categories: 18 to 39 years, 40 to 64 years, and older than 65 years.

- Sex: defined as either male or female participant.

- District Municipality: In South Africa a district municipality or a category C municipality is a municipality that performs some of the functions of local government for the district. In the present study, the following districts were the focus of our interest: City of Johannesburg, City of Tshwane, Ekurhuleni, Metsweding, Sedibeng and West Rand.

- Sub-district Municipality: The 12 sub-districts of Gauteng were part of our study: Ekurhuleni Metropolitan Municipality, Emfuleni Local Municipality, Midvaal Local Municipality, Lesedi Local Municipality, Nokengtsa Taemane Local Municipality, Kungwini Local Municipality, Mogale City Local Municipality, Randfontein Local Municipality, Westonaria Local Municipality, West Rand, City of Johannesburg Metropolitan Municipality, and City of Tshwane Metropolitan Municipality.

- Marital status: This considered the marital state of the participants: either married or unmarried, eight categories were identified as follows: married civil/religious; married by traditional/customary; polygamous marriage; living together as married partners; never married; widower/widow; separated and divorced.

- Race: This is defined as the population group of persons or participants in the selected dwellings. It is accepted that black, coloured, white and Indian or Asian are the four population groups comprising the South African population.

- Employment status: According to Stats SA, the unemployed were/are those people within the economically active population who did not work in the seven days prior to the night of the survey; who wanted to work and were available to start work within a week of the survey and had taken active steps to look for work or to start some form of self-employment in the four weeks prior to the survey. Four categories were listed with regard to the employment status: employed; unemployed; not economically active; and not specified.

- Level of education: The level of education was defined as the highest level of education that the participant has completed. For the purpose of simplification, four categories were identified: never attended school; primary school (Grade R to Grade 7); high school (Grade 8 to Grade 12) and tertiary (post matric upward).

- Disability intensity: This is defined as a self-perceived ability or inability to work. The disabled were allowed to say yes or no if their disability prevented them from working. Three categories were identified: not applicable; Disability seriously prevents full participation in life activities; and not preventing full participation in life activities.

- Disability type: Seven categories were identified: not disabled; sight; hearing; communication; physical; intellectual; emotional and multiple.

- Type of social grant: In South Africa there are several social grants. A categorical variable was created which contained other social grants and disability grants. The disability grant is the form of social assistance provided to disabled individuals aged 18 years and over.

- Household asset index: This index was calculated in lieu of the gini coefficient, as planned in the research protocol. The household asset index was used using the following goods/variables: fridge, radio, post office facility, cellular phone, internet connection, telephone, computer and television set. A household was defined as a group of persons who live together, and provide themselves jointly with food and/or other essentials for living. The household asset index was identified as having three categories: most poor; poor; and least poor.

2.6.1.2 Outcome variable

The outcome of interest was any disability (type) count (number of disabled persons) as enumerated in the 2007 Community Survey. Disability is defined in the survey as:

> "a handicap which has lasted for six months or more, or was expected to last at least six months, which prevents the person from carrying out daily activities independently, or from participating fully in education, economic or social activities".

The types of disability assessed were as follows:

-Sight
-Hearing
-Communication
-Physical
-Intellectual
-Emotional
-Multiple

2.7 Data processing and analysis

2.7.1 Data processing

STATA 12.0 software was used to carry out the process of cleaning, coding and statistical analysis. Participants not belonging to Gauteng were dropped. In the Gauteng dataset, only participants aged 18 years and older were included in the study. The cleaning of data involved checking for missing entries and inconsistent values. All missing values were excluded from statistical tests. The categorical variables were then generated. New variables consistent with the research aim were also generated, such as age group categories and the household asset index.

2.7.2 Data analysis

Descriptive and inferential analysis was performed, as shown below.

2.7.2.1 Descriptive Statistics

Cross-tabulation of the categorical variables was performed with chi-squared tests carried out to compare differences in characteristics between the categorical variables.

Data were described to summarise basic features and results were presented in frequency distribution tables, as shown in Chapter 3. This process was carried out with the help of Microsoft Excel and STATA (version 12) software.

The point prevalence (2007) of reported disability and disability type was estimated. For each sub-district, an aerial map showing the distribution of the disability burden and associated indicators was developed. 95% confidence limits constructed around the disability burden (point prevalence), as well as associated indicators were worked out and this helped to test if there were any significant differences between sub-districts.

The spatial distribution of the disability burden and disability grant allocation was established by the study of proportion of the disability burden, as well as the study of the disability grant allocation. Maps of distribution of the disability and grant allocation were done using a relevant software (Map info Professional). The shapefile was obtained from the "Municipal Demarcation Board".

The proportion of reported disability and disability type, as well as the proportion of allocated disability grants, were estimated.

For each sub-district, an aerial map showing the distribution of the disability burden and the disability grant allocation, with 95% confidence limits, was developed. The sub-district/district disability proportion was compared to the overall Gauteng disability proportion and results of the descriptive statistics were presented in graphs and tables, as shown in the results section in chapter 3.

2.7.2.2 Inferential Statistics

Robust Poisson regression analysis was done to test the existence of any association between the explanatory variables under study and the disability variable. Bivariate and multivariable Poisson regression models were constructed with incidence relative risk (IRR) as measures of effect. Chi-square tests (for categorical variables) were then used to test for associations, and a 5% level of significance between the independent variables and the outcome was used. Bivariate models

were fitted to the data to identify individual factors that were associated with the outcome. Robust Poisson regression was used for this purpose. Independent variables with p-value ≤0.20 in bivariate analysis were included in the multivariable analysis. The association between the disability and the disability grant was estimated by measuring the spearman correlation coefficient.

Multivariable analysis was performed using stepwise Poisson regression, employing forward selection and backward elimination. The models were tested using the Likelihood-ratio test. The significance levels of estimates for the incidence relative risk in the Poisson regression was defined as a p-value equal or less than 0.05 significant levels. In this study, a p-value higher than 0.05 in the multivariate analysis was considered not statistically significant and factors found to be significant in the multiple Poisson regression model were fitted in a final model and used to explain the risk factors associated with any disability in the Gauteng Province.

Results of the inferential statistics were also presented by use of graphs and tables, as shown in the results section.

2.8 Ethical considerations

Permission to use the 2007 Survey Data was granted by Stats SA. The Ethics Committee of the School of Public Health University of Witwatersrand approved the study for Research on Human Subjects (Clearance number: M130816M130816, see appendix A).

CHAPTER 3: RESULTS

This chapter focuses on the results of the analysis of participants with any form of disability found in the 2007 Survey dataset in South Africa, and specifically in Gauteng Province. Descriptive statistics and robust Poisson regression analysis of the association of demographic characteristics and any disability are presented.

3.1 Socio-demographic characteristics amongst disabled population

There were 133,691 adult participants who were eligible for the study. Of this total number, 4,492 reported some form of disability. Two thousand two hundred and thirty three (2,333 or 51,94%) of the disabled participants were males and 2,159 (48,06%) were females.

Most of the disabled were in the age category 40 to 64 years (51,51%), followed by those aged 18 to 39 years (33,17%), and then those 64 years of age and older.

Most of the disabled participants were black (77,8%), followed by whites (15,69%). With regards to marital status, 42,72% of the disabled participants had never been married. More than half of disabled participants (59,75%) had a high school level of education while primary school was the highest level of education for 25,31% of the participants. Approximately 18% of the disabled were employed. The City of Johannesburg (34,93%) and Ekurhuleni (26,89%) comprised more than half of the disabled in the Gauteng Province, followed by the City of Tshwane district (19,08%).

Table 1: Socio-demographic characteristics amongst disabled population

Characteristic	Total	Percentage
Sex		
Male	2333	51,94
Female	2159	48,06
Age category		
Younger working category:		
18 to 39	1490	33,17
Older working age: 40 to 64	2314	51,51
Retirement age 65+	688	15,32
Race		
African	3495	77,8
Coloured	187	4,16
Indian (Asian)	105	2,34
White	705	15
Marital status		69
Married civil/religious	1087	24,2
Married traditional/customary	372	8,28
Polygamous marriage	3	0,07
Living together as married	321	7,15
Never married	1919	42,72
Widower/widow	505	11,24
Separated	89	1,98
Divorced	196	4,36
Level of education		
Never attended school	559	12,44
Primary school	1137	25,31
High school	2684	59,75
Tertiary	112	2,49

Table:1 cont'd

Employment status		
Employed	790	17,59
Unemployed	341	7,59
Not economically active	2664	59,31
Not specified	697	15,52
District		
City of Johannesburg	1569	34,93
City of Tshwane	857	19,08
Ekurhuleni	1208	26,89
Metsweding	101	2,25
Sedibeng	531	11,82
West Rand	226	5,03
Local municipality		
Ekurhuleni	1208	26,89
Emfuleni	443	9,86
Midvaal	50	1,11
Lesedi	38	0,85
Nokengtsa Taemane	19	0,42
Kungwini	82	1,83
Mogale City	119	2,65
Randfontein	57	1,27
Westonaria	46	1,02
West Rand	4	0,09
City of Johannesburg	1569	34,93
City of Tshwane	857	19,08

3.2 Distribution of socio-demographics characteristics amongst disability grant recipients

Slightly more than half of the disability grant was given to the male disabled participants (51,34%); about 67,93% of the disability grant was given to the older working age category (40-64years); more than 80% of the disability grant support was issued to the black population group; more than 45 % of the disability grant support issued was given to people who were never married; more than 80% of the disability grants issued were given to the non-economically active category of disabled people; and the City of Johannesburg, City of Tshwane and Ekurhuleni local municipality received more than 60 % of the disability grant support.

Table 2: Socio-demographic characteristics amongst disability grant recipients

Characteristic	Total	Percentage
Sex		
Male	1417	51,34
Female	1343	48,66
Age category		
Younger working age: 18 to 39	885	32,07
Older working age: 40 to 64	1875	67,93
Race		
African	2235	80,98
Coloured	145	5,25
Indian (Asian)	83	3,01
White	297	10,76
Marital status		
Married civil/religious	691	25,04
Married traditional/customary	193	6,99
Polygamous marriage	1	0,04
Living together as married	185	6,7
Never married	1273	46,12
Widower/widow	229	8,3
Separated	63	2,28
Divorced	125	4,53
Level of education		
Never attended school	348	12,61
Primary school	785	28,44
High school	1591	57,64
Tertiary	36	1,3

Employment status		
Employed	223	8,08
Unemployed	183	6,63
Not economically active	2307	83,59
Not specified	47	1,7
District		
City of Johannesburg	929	33,66
City of Tshwane	524	18,99
Ekurhuleni	800	28,99
Metsweding	76	2,75
Sedibeng	298	10,8
West Rand	133	4,82
Local municipality		
Ekurhuleni	800	28,99
Emfuleni	250	9,06
Midvaal	23	0,83
Lesedi	25	0,91
Nokengtsa Taemane	9	0,33
Kungwini	67	2,43
Mogale City	71	2,57
Randfontein	44	1,59
Westonaria	16	0,58
West Rand	2	0,07
City of Johannesburg	929	33,66
City of Tshwane	524	18,99

3.3 Comparison of socio-demographic characteristics between disabled and non-disabled.

A total of 133,691 participants were counted and included in the study. There were statistically significant associations between disability and sex, age category, race, marital status, level of education, employment status, district and local municipality as shown in figure 3. Of this total, 49,37% (58,909) of individuals not disabled were male and 50,63 % (60,411) were female, whereas 51.94% (2,333) of the disabled participants were male and 48,06% (2,159) were female. There was significant association between gender and disability ($\chi^2_{(1)}$ =11.4, p= 0.001)(Table 3). Table 3 shows that there were significant differences in the proportions of disabled people between the three age groups ((18-39): 33.17%, (40-64): 51.51%, (65 and above): 15.32%, p-

value =0.0001). There were more disabled than non-disabled respectively in the age category of 40 to 64 years of age at 51,51% (2,314), and 15,32% (688) in the age category 65 years and over. There were also significant differences in disability proportion amongst different race ($\chi^2_{(3)}$ =12.8, p= 0.005). A proportion of 77,80% (3.490) disabled versus 78,45% (93,611) of non-disabled were black. A proportion of 4.16% (186) of people living with disability versus a 3.23% (3858) of non-disabled were coloured. A proportion of 2.34% (105) of disabled against 2.60% (3102) and a proportion of 15,69% (705) disabled versus15.71% (18749) were of the white population.

Table 3 shows that a proportion of 24.20% (1087) of disabled versus 27,29% (32,559) of non-disabled participants were in a civil/religious marriage. A proportion of 8.28% (372) disabled versus 9,95% (11,878) of non-disabled were married traditionally (customary marriage). A proportion of 0.07% (3) disabled versus 0,07% (79) were in a polygamous marriage. A proportion of 7.15% (321) of disabled against 10,49% (12,520) of non-disabled were living together as married. A proportion of 42.72% (1919) of disabled versus 44,75% (53,400) of non-disabled were never married. A proportion of 11.24% (505) of disabled versus 4,29% (5,119) of non-disabled were either widows or widowers. A proportion of 1.98% (89) of disabled versus 0,90% (1,074) of non-disabled were separated; and a proportion of 4.36% (196) of disabled versus 2,26% (2,691) of non-disabled were divorced.

The difference in marital status between non-disabled and disabled was statistically significant ($\chi^2_{(7)}$ = 675.1, p <0.001).

Table 3 also shows that there were significant differences in proportions of the level of education between non-disabled and disabled ($\chi^2_{(3)}$ =1.8 e+3, p <0.001). A proportion of 12,44% (559) of the disabled participants against 3,87% (4,612) of the non-disabled participants never attended school. A proportion of 25,31% (1,137) of disabled versus 11,15% (13,302) of the non-disabled participants attended primary school. A proportion of 59,75% (2,684) of disabled versus 78,74% (93,952) non-disabled participants attended high school and only 2,49% (112) of the disabled against 6,25% (7,454) of the non-disabled participants had a tertiary qualification.

Table 3 shows that a proportion of 17,59% (790) of disabled individuals versus 50,43% (60,173) of non-disabled were employed; and 59,31% (2,664) disabled against 19,79% (28,825) of non-disabled were classified as not economically active; and a proportion of 15,52% (697) of

disabled versus compared to 6,63% (7,905) were not specified. These differences in proportion of the employment status between disabled and non-disabled were statistically significant ($\chi^2_{(3)}$ =5 e+3, p <0.001).

Table 3 also shows that a proportion of 34.93% (1569) of disabled versus 36.07% (43044) of non-disabled were living in the city of Johannesburg. A proportion 19.08 % (857) of disabled versus 21,96% (26205) were living in the city of Tshwane. A proportion of 26.89% (1208) of disabled versus 26.08% (31.123) non-disabled were living in Ekurhuleni. A proportion of 2.25 % (101) of disabled versus 2,48% (2961) of non-disabled were living in Metsweding. A proportion of 11.82% (531) of disabled versus 8.27% (6123) of non-disabled were living in Sedibeng and a proportion of 5.03% (226) of disabled versus 5.13% (6123) of non-disabled were living in west Rand.. There were significant differences in the proportion of disabled people between different districts of Gauteng ($\chi^2_{(5)} = 85.3$, p <0.001).

The table (3) finally shows that a proportion of 26.89% (1208 of disabled versus 26.08% (31123 of non-disabled were living in Ekurhuleni Metropolitan municipality; a proportion of 9.86% (443 of disabled against 6.37% (7606) of non-disabled were living in Emfuleni local municipality; a proportion of 1.11% (50) of disabled versus 1.11% (1321) of non-disable were living in Midvaal local municipality; a proportion of 0.85% (38) of disabled versus 0.79% 9937) of non-disabled were living Lesedi local municipality, a proportion of0.42 % (19) of disabled versus 0.75% (893 of non-disabled were living in Nokengtsa Tae local municipality; a proportion of 1.83% (82) disabled against 1.73% (2068) of non-disabled were living in Kungwuini local municipality; a proportion of 2.65% (119) of disabled versus 2.86% (3412) of non-disabled were living in Mogale city local municipality; a proportion of 1.27% (57) of disabled versus 1.13% (1343) of non-disabled were living Randfontein local municipality; a proportion of 1.02% % (46) disabled versus 0.99% (1182)non-disabled were living in Westonaria local municipality; a proportion of 0.09% (4) of disabled versus 0.16% (186) non-disabled were living in West Rand local municipality; a proportion of 34.93% (1569) versus 36.07% (43044) non-disabled were living in the city of Johannesburg local municipality and a proportion of 19.08% (857) disabled against 21.96% (26205) non-disabled were living in the city of Tshwane local municipality. 36,07% (43,044) of non-disabled participants in the City of Johannesburg and 21,96% (26,205) in City of Tshwane, compared to 34,93% (1,569) of disabled in the City of Johannesburg district and 19,08% (857) in the City of Tshwane district.

There were significant differences in the proportion of disabled people between different local municipalities in Gauteng ($\chi^2_{(11)} = 109.5$, $p < 0.001$).

Table 3: Socio-demographic characteristics between disabled and non-disabled

Characteristic	Non-disabled N (%)	Disabled N (%)	Chi-Square (df)	P-value
Sex				
Male	58,909(96.19)	2,333 (3.81)		
Female	60,411(96.55)	2,159 (3.45)	11.40 (1)	0,001
Age category				
Younger working age: 18 to 39	74,428 (98.04)	1,490 (1.96)		
Older working age: 40 to 64	38,390 (94.32)	2,314 (5,68)		
Retirement age 65 +	6,502 (90.43)		1.8 e+03 (2)	< 0.001
Race				
African	93,611 (96.40)	3,495 (3.60)		
Coloured	3,858 (95.38)	187 (4.62)		
Indian (Asian)	3,102 (96.38)	105 (3.27)	12.83 (3)	0.005
White	18,749 (96.38)	705 (3.63)		
Marital status				
Married cinil/Religion	32,559 (96.77)	1,087 (3.23)		
Married traditional/customary	11,878 (96.96)	372 (3.04)		
Polygamous Marriage	79 (96.34)	3 (3.66)		
Living togother as Married	12,520 (97.50)	321 (2.50)		
Never Married	53,400 (96.53)	1,919 (3.47)		
Widower/ widow	5,119 (91.02)	505 (8.98)	675.19 (7)	< 0.001
Separated	1,074 (93.21)	89 (7.65)		

Divorced	2,691 (93.21)	196 (6.79)		
Level of Education				
Never School	4,612 (89.19)	559 (10.81)		
Primary School	13,302 (92.13)	1,137 (7.87)		
High School	93,952 (97.22)	2,684 (2.78)	1.8 e+3 (3)	< 0.001
Higher School	7,454 (98.52)	112 (3.63)		
Employment Status				
Employed	60,173 (98.70)	790 (1.30)		
Unemployed	27,417 (98.77)	431 (1.23)		
Not economically active	23,825 (89.94)	2,664 (10.06)	5. e+03 (3)	< 0.001
Not specified	7,905 (91.90)	697 (8.10)		
District Name				
City of Johannesburg	43,044 (96.48)	1,569 (3.52)		
City of Tshwane	26,205 (96.83)	857 (3.17)		
Ekurhuleni	31,123 (96.26)	1,208 (3.30)		
Metsweding	2,961 (96.70)	101 (3.30)	85.30 (5)	< 0.001
Sedibeng	9,864 (94.89)	531 (5.11)		
West Rand	6,123 (96.37)	226 (3.56)		
Local Municipality				
Ekurhuleni Metro	31,123 (96.26)	1,208 (3.74)		
Emfuleni	7,606 (94.50)	443 (5.50)		
Midvaal	1,321 (96.35)	50 (3.90)		
Lesedi	937 (96.10)	38 (3.90)		

Nokeng tsa Tae	893 (97.92)	19 (2.08)		
Kungwini	2,068 (96.19)	82 (3.81)		
Mogale city	3,412 (96.63)	119 (3.37)		
Randfontein	1,343 (95.93)	57 (4.07)	109.53 (11)	< 0.001
Westonaria	1,182 (96.25)	46 (3.75)		
West Rand	186 (97.89)	4 (2.11)		
City of Johannesburg	43,044 (96.48)	1,569 (3.52)		
City of Tshwane	26,205 (96.83)	857 (3.17)		

3.4 Proportion of disability and disability grant per district

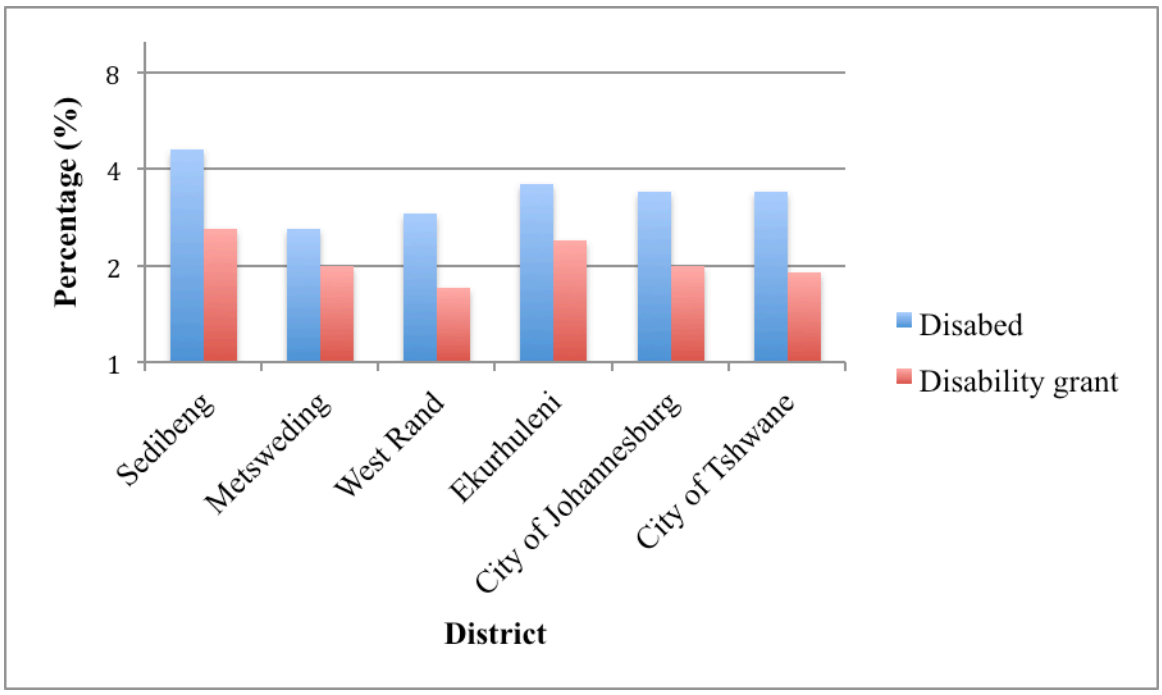

Figure 2: Proportion of disability and disability grant per district

The districts with the highest reported number of disabled (City of Johannesburg, City of Tshwane and Ekurhuleni) had the highest number of disability grants issued. There was an apparent correlation between disability and disability grant allocation within these districts (see figure 2).

Table 4: Disability and disability grant by sex

	Sex					
	Male			Female		
Any disability	Others social grant	Disability grant	Total	Others social grant	Disability grant	Total
No	97.77	29.36	96.64	97.87	36.34	97.08
Yes	2.23	70.64	3.36	2.36	63.66	2.92
Total	100.00	100.00	100.00	100.00	100.00	100.0(

P = 0.000

Table 4 shows that there was a statistically significant difference in disability grant allocation between female disabled and male disabled, with a p-value ($p < 0.001$) according to Chi square. This was confirmed later with a test a proportion. The test of proportion suggested that there were a significantly higher proportion of disabled males who received a grant compared to disabled females ($p<0.001$).

3.5 Disability and disability grant distribution per municipality

The proportion of disability and disability grant allocation at municipality level appeared to be the same as observed at a district level, as illustrated in Figure 3. The City of Johannesburg had the highest number of disabled individuals as well as the highest number of disability grant allocations followed by Ekurhuleni and the City of Tshwane. The West Rand had the least number of disabled and disability grant.

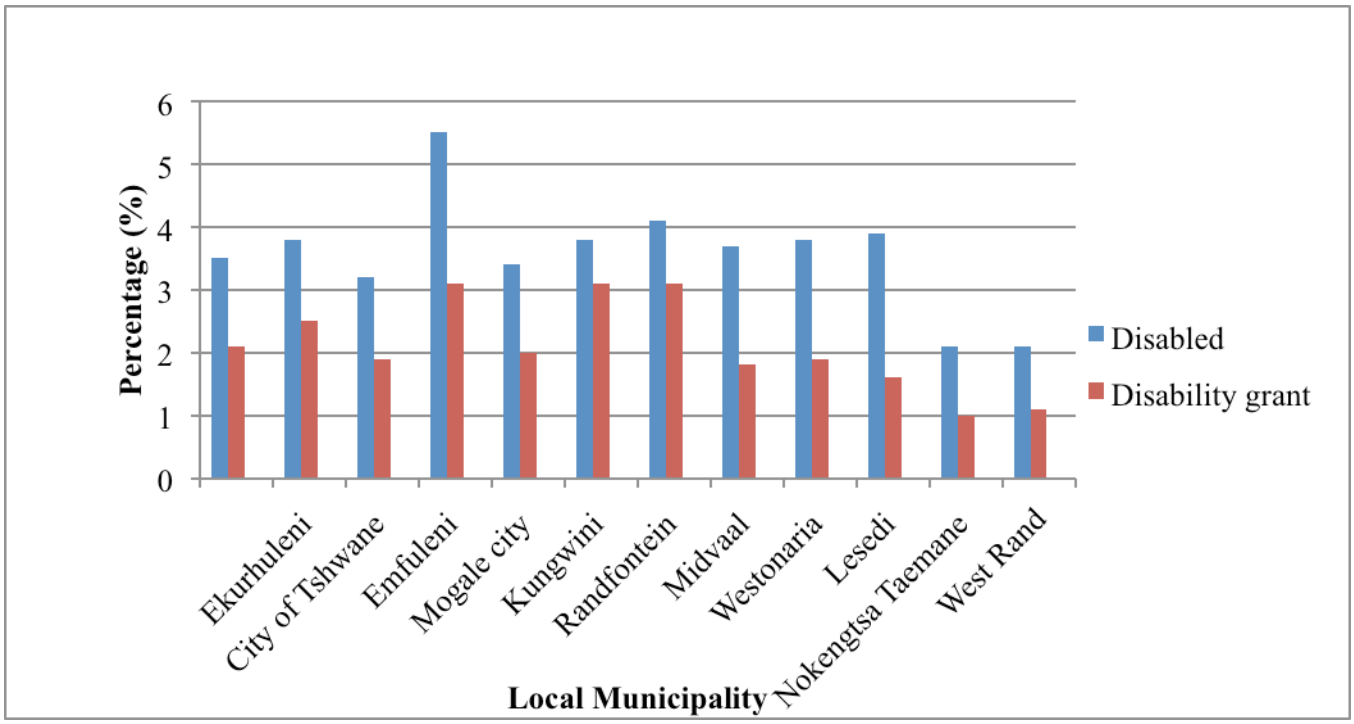

Figure 3: Disability and disability grant distribution per municipality

3.6 Spatial distribution of disability and disability grant

The more the number of disabled in a district or in a municipality, the more the disability grant support issued (Figure 4 and 5). The City of Johannesburg Metropolitan had the highest number of persons living with disability, followed by Ekurhuleni and the City of Tshwane. Nokengtsa Taemane had the smallest number of people living with a disability. In the same

order, the City of Johannesburg had received the highest number of disability grants, followed by Ekurhuleni and the City of Tshwane. Nokengtsa Taemane had the least number of people who had received a disability grant.

Table 5 shows that on average, for every disability grant allocated, there were 1,77 disabled individuals. For small local municipalities such as Midvaal Local, Westonaria Local, Westonaria Local, Lesedi Local, Nokengtsa Taemane Local and West Rand, there were two disabled individuals for every disability grant allocated

Table 5: Spatial distribution of disability and disability grants in Gauteng province.

Local Municipality	Disabled	Disability grant	Ratio disabled/ disability grant
Ekurhuleni	1569	929	1,69
Emfuleni	1208	800	1,51
Midvaal	857	524	1,64
Lesedi	443	250	1,77
Nokengtsa Taemane	119	71	1,68
Kungwini	82	67	1,22
Mogale city	57	44	1,3
Randfontein	50	25	2
Westonaria	46	23	2
West Rand	38	16	2,38
City of Johannesburg	19	9	2,11
City of Tshwane	4	2	2

Table 6: Disability burden per district

District	Not disabled	Disabled	Total
Sedibeng	11217	539	11756
Metsweding	3991	108	4099
West Rand	7756	228	7984
Ekurhuleni	32604	1234	33838
City of Johannesburg	45366	1596	46962
City of Tshwane	28167	885	29052
Total	129101	4590	133691

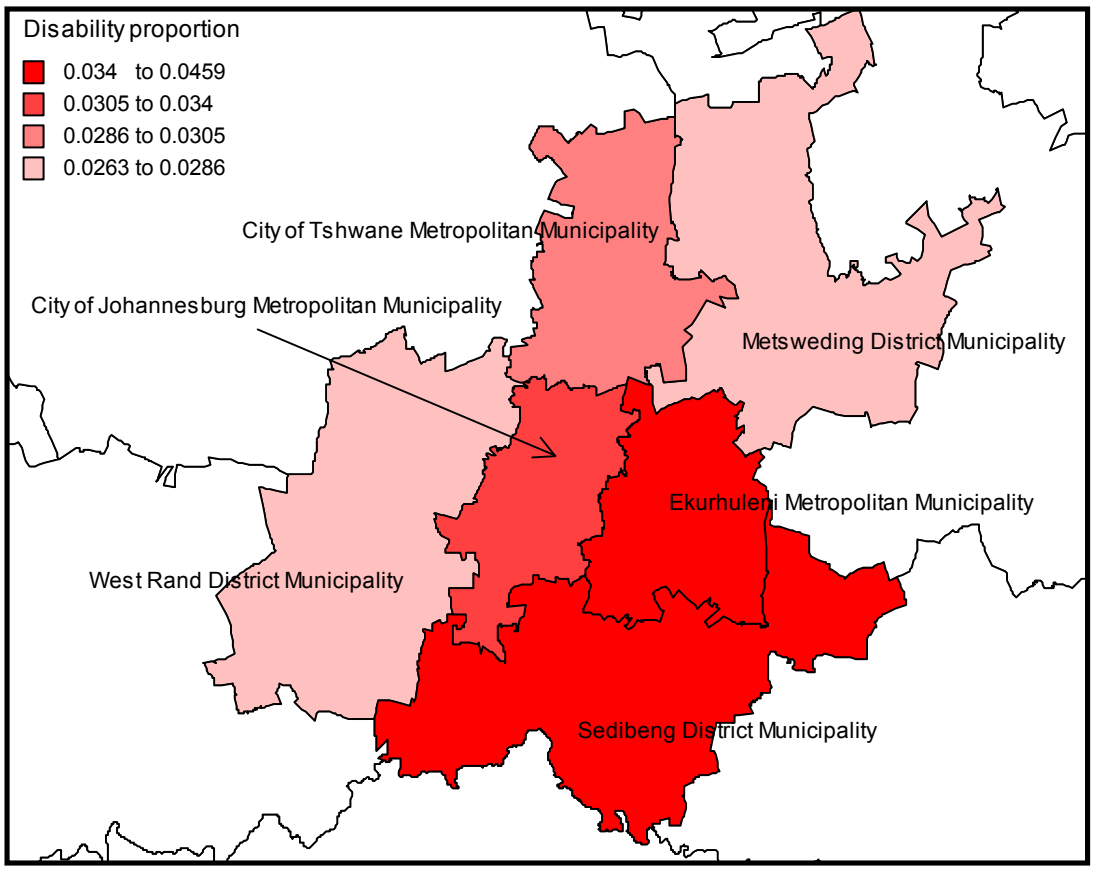

Figure 4: Spatial distribution of disability burden in Gauteng province.

Table 7: Disability grant allocation per district

District	Others social grant	Disability grant	Total
Sedibeng	11453	303	11756
Metsweding	4019	80	4099
West Rand	7847	137	7984
Ekurhuleni	33019	819	33838
City of Johannesburg	46014	948	46962
City of Tshwane	28505	547	29052
Total	130857	2834	133691

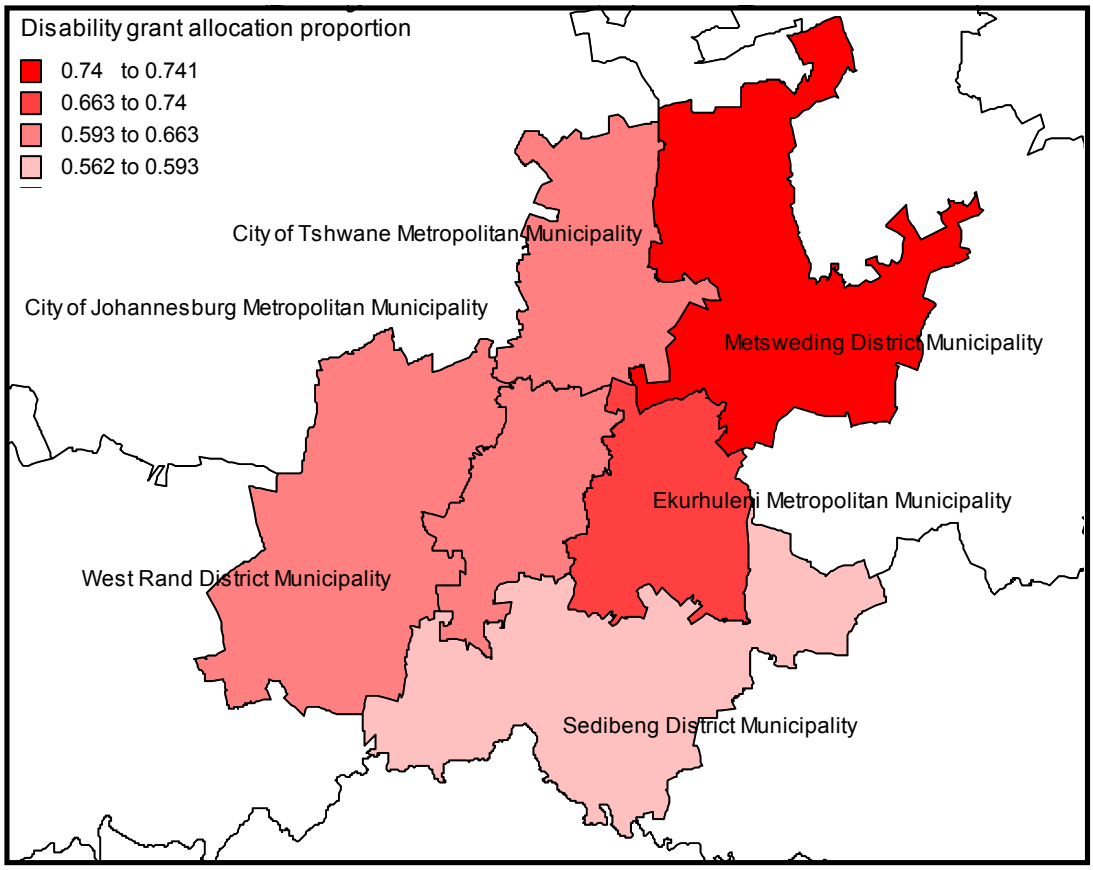

Figure 5: Spatial distribution of disability and disability grant in Gauteng province.

3.7 Proportion of disability per self-reported severity

In term of severity of disability as perceived by the disabled, it appeared that the higher the prevalence of a reported disability the higher the number of disabled who reported their disability to be hard within a district or a local municipality. As shown in Table 8 below, in term of prevalence of self-reported severity of disability, the City of Johannesburg was leading (34%) followed by Ekurhuleni (27%) and the City of Tshwane (18%).

Table 8: Proportion of disability per self-reported severity

District	Frequency	Percentage
City of Johannesburg	845	33,94
Ekurhuleni	683	27,43
City of Tshwane	442	17,75
Sedibeng	329	13,21
West Rand	131	5,26
Metsweding	60	2,41

3.8 Disability type per age category

Individuals aged between 40 and 64 years were affected by almost all types of disabilities, broken down as follows, with 57% of physical disability, 55% of emotional disability, 52% of sight disability and 38% of multiple disabilities. The most prevalent disability for this age category was physical disability; whereas 60 % of intellectual disability was found amongst individuals of the younger age category (age 18 to 39 years) (table 9).

Physical disability was the most common type of disability across all age categories, broken down as follows: 34% of 18 to 39 years; 47% of 40 to 64 years; and 47% of 65 years and over being physically disabled .The differences in the age categories were statistically significant ($\chi^2_{(12)} = 251.2$, $p<0.001$). A multiple disability was the less common disability amongst the younger age category of 18 to 39 years, as well as those amongst the 40 to 64 year category; while intellectual disability was the less common disability amongst individuals aged 65 years and over. Details are shown in Table 9 as follows:

'able 9: Proportions of disability type per age category

ge category	**Disability type N (%)**							
	Sight	Hearing	Communication	Physical	Intellectual	Emotional	Multiple	Total
'oung working	175(12)	154(10)	83(6)	500(34)	162(11)	345(23)	71(5)	1490(100)
)lder working	335(14)	175(8)	83(4)	1090(47)	93(4)	462(20)	76(3)	2314(100)
.etirement	137(20)	83(6)	19(3)	321(47)	15(2)	63(9)	51(7)	688(100)
'otal	647(14)	41(19)	185(4)	1911(43)	270(6)	870(19)	198(4)	4492(100)

earson chi2 (12) = 251.1763 Pr <0.001

3.9 Prevalence of disability per household asset index in the local municipality

As indicated in Table 10, across all local municipalities it appeared that disability is more prevalent in "the poorest" households. The City of Johannesburg, Ekurhuleni, City of Tshwane, Emfuleni, kungwini, Randfontein local municipality had a higher prevalence of disability in poor household compared to least poor households. In Midvaal local municipality, Lesedi, Nokeng tsa taemane, Mogale city and Westonaria local municipality the disability prevalence rate is higher in least poor households compared to poor households.

The City of Johannesburg had 34,93% of Gauteng disabled, of which 25,24% were classified as poor, 19,76% least poor and 55% the poorest.

Ekurhuleni local municipality followed with 26,89% of the population, disabled, of which 24,01% was classified as poor, 17,88% the least poor and 58,11 the poorest. In the City of Tshwane, the 3rd most prevalent, with 19,08% of population being disabled, 23,10% were poor, 22,17% the least poor and 54,73% the poorest.

All the disabled population of West Rand appeared to belong to the poorest category of households.

Table 10: Proportion of disability per household asset index per local municipality

Local Municipality	Poorest	Poor	Least poor
Ekurhuleni	58.11	24.01	17.88
Emfuleni	70.88	20.99	8.13
Midvaal	56.00	18.00	26.00
Lesedi	44.74	23.68	31.58
Nokengtsa Taemane	57.89	10.53	31.58
Kungwini	81.71	12.20	6.10
Mogale city	73.95	10.08	15.97
Randfontein	75.44	14.04	10.53
Westonaria	82.61	6.52	10.87
West Rand	100.00	0.00	0.00
City of Johannesburg	55.00	25.24	19.76
City of Tshwane	54.73	23.10	22.17
Total	58.86	22.93	18.21
Pearson chi2 (22) = 119,0642	Pr < 0.001		

3.10 Disability by sex per district and local municipality

The prevalence of disability was generally higher in males than females. The females out-numbered the males in disability only in the district of Ekurhuleni.

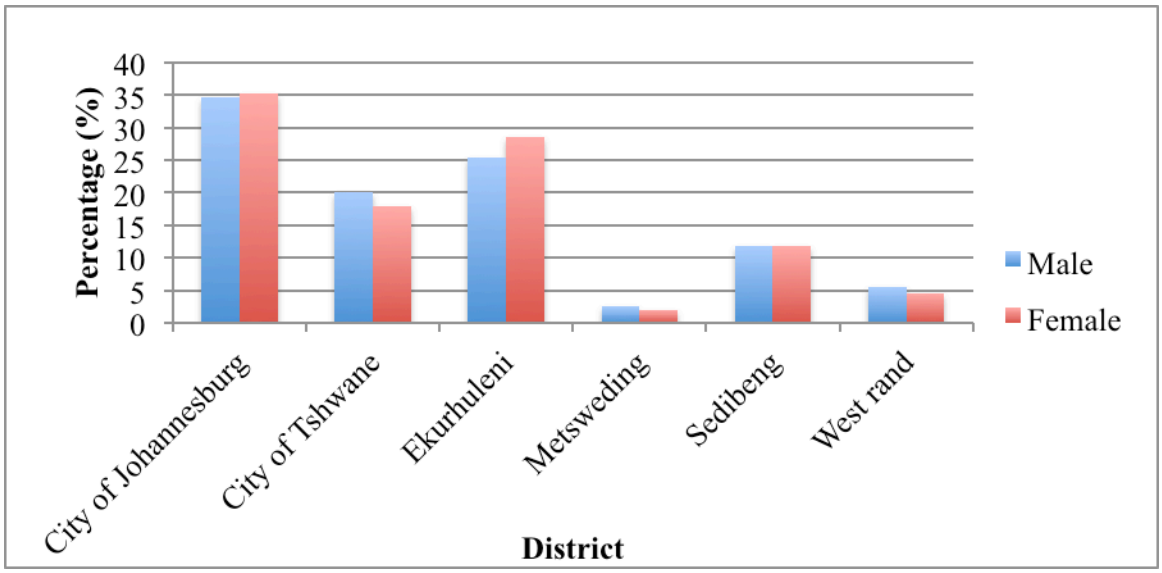

Figure 6: Disability per sex per district

At the local municipality level, Ekurhuleni local municipality and Lesedi local municipality had a higher number of females with any disability compared to other local municipalities, except the West Rand where the number of disabled was the same across both sexes.

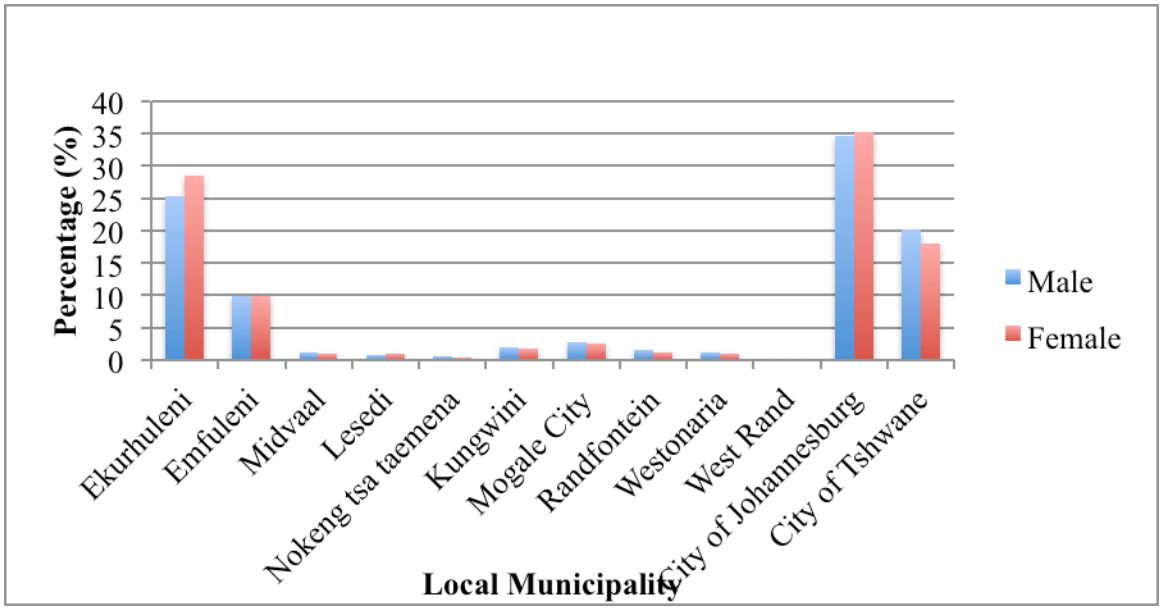

Figure 7: Disability per sex per local municipality

3.11 Factors associated with disability burden

3.11.1 Bivariate analysis

In this section, results on association between disability and various demographics and socio-economic factors are presented. Table 9 shows the bivariate Poisson regression.

The following factors were significantly associated with the increased likelihood of any disability occurrence in bivariate analysis (Table 9) and were included in the multivariable Poisson regression model:

- Demographic factors: sex, age category, race and district name.
- Socio-economic factors: marital status, level of education, employment status, household asset index and disability grant.

3.11.2 Multivariable analysis

Sex, age category, race, marital status, level of education, employment status, household asset index and district of residence were noted to be statistically significant factors affecting disability at the multivariate level, as shown in Table 11.

3.11.2.1 Demographic factors:

- Sex: Sex was associated with the reported number of disabilities, where females were 40% less likely to report any disabilities than males in multivariable analysis (IRR 0.6, CI 0.59-0.67, p= <0.001). This was statistically significant.

- Age category: Individuals in the 40 to 64 age category (IRR 2.9, CI 2.6-3.1, p=<0001) and those of 65 years and older (IRR 3.0, CI 2.5-3.5, p=<0.001) were respectively associated with a 190% and 200% increased risk of disability.

- Race: Coloured and white participants showed a 1.4 times greater risk of having any disability compared to individuals in the black community; these differences were statistically significant in multivariable analysis. The Indian community had 1.1 times the risk of having any disability compared to the black community and the difference was not statistically different.

- District Name: Respectively, living in City of Tshwane was associated with a 10% reduction in the risk of having any disability (IRR 0.9, CI0.80-0.95, p=0.001); living in

Metsweding (IRR 0.8, CI 0.63-0.95, p=0.012) was associated with a 20% risk reduction; living in the West Rand (IRR 0.9, CI 0.75-0.99, p= 0.037) the risk of any disability was reduced by 10%. These differences were statistically significant.

Life in Ekurhuleni (IRR 0.99,CI0.92-1.1 p=0.75) was associated only with a 1% risk reduction and the risk of any disability was increased by 7% for those living in Sedibeng (IRR1.07, CI0.97-1.18, p=0.187)- these differences were not statistically significant.

3.11.2.2 Socio economics factors

- Marital status: There were no risk difference between participants married by traditional marriage (IRR 1.1, CI 0.97-1.24, p =0.14) or those in a polygamous marriage (IRR 1.0, CI 0.33-3.21, p= 0.96) in terms of any disability, compared to those married by a civil/religious marriage. Although not statistically significant, living together as Married (IRR 1.2, CI 1.06-1.37, p=0.006) increased the risk of any disability by 20%; Never Married (IRR 1.6, CI 1.49-1.78, p< 0.001) or separated (IRR 1,6, CI 1.34-2.24, p<0.0001) the risk of any disability increased by 60%. The status of Widow/Widower (IRR 1.4, CI 1.2-1.6, p <0.001) had a 40% more likelihood of reporting any disability.

Being divorced (IRR 1.9, CI 1.65-2.24, p<0.001) had a 90% risk associated with any disability and the observed differences were statistically significant.

- Level of education: Having attended high school (IRR 0.48, CI 0.44-0.53, p <0.001) was associated with a 52% decreased risk of any disabilities, while tertiary or post matric and above (IRR 0.34, CI 0.27-0.42, p< 0.001) was associated with a 66% decreased risk of any disability, compared to primary school (IRR 0.8, CI 0.76-0.93, p = 0.001). These differences were statistically significant

- Employment status: Participants classified as not economically active were 7.5 times at risk of being disabled (IRR 7.5, CI6.95-8.19, p < 0.001). The observed difference was statistically significant.

- Household asset index: Households classified as the least poor were30% less likely to report any disability (IRR 0.7, CI 0.62-0.75, p <0.001) while those households classified as poor were 10% less likely to report any disability (IRR 0.9, CI 0.81-0.94, p <0.001); this compared to the poorest households - the differences were statistically significant.

Table 11: Factors associated with disability in Gauteng Province

	Bivariate analysis		Multivariable analysis	
Predictor	IRR (95% CI)	p-value	IRR (95% CI)	p-value
Gender				
Male	Reference			
Female	0.91 (.86 .96)	0,001	0.63 (.59 .67)	< 0.001
Age category				
Young working age : 18 to 39	Reference			
Older Working age : 40 to 64	2.90 (2.72 3.09)	< 0.001	2.87 (2.65 3.11)	< 0.001
Retirement age: 65+	4.88 (4.47 5.32)	< 0.001	2.96 (2.49 3.52)	< 0.001
Race				
African	Reference			
Coloured	1.28 (1.11 1.48)	0,001	1.37 (1.18 1.59)	< 0.001
Indian (Asian)	0.91 (.75 1.10)	0,331	1.12 (.92 1.37)	0,247
White	1.01 (.93 1.09)	0,866	1.41 (1.28 1.56)	< 0.001
Marital Status				
Married Civil/Religion	Reference			
Married Traditional/Customary	0.94 (.84 1.06)	0,295	1.10 (.97 1.24)	0,14
Polygamous Marriage	1.13 (.37 3.44)	0,827	1.03 (.33 3.21)	0,957
Living together as Married	0.77 (.68 .87)	< 0.001	1.20 (1.06 1.37)	0,006

Never Married	1.07 (1.00 1.16)	0,057	1.63 (1.49 1.78)	< 0.001
Widower/Widow	2.78 (2.51 3.08)	< 0.001	1.44 (1.28 1.61)	< 0.001
Separated	2.37 (1.92 2.92)	< 0.001	1.67 (1.34 2.08)	< 0.001
Divorced	2.10 (1.81 2.43)	< 0.001	1.92 (1.65 2.24)	< 0.001
Level of Education				
Never school	Reference			
Primary school	0.73 (.66 .80)	< 0.001	0.84 (.76 .93)	0,001
High school	0.26 (.24 .28)	< 0.001	0.48 (.44 .53)	< 0.001
Higher school	0.14 (.11 .17)	< 0.001	0.34 (.27 .42)	< 0.001
Employment Status				
Employed	Reference			
Unemployed	0.95 (.84 1.08)	0,407	1.06 (.93 1.21)	0,349
Not economically active	7.76 (7.18 8.39)	< 0.001	7.54 (6.95 8.18)	< 0.001
Not specified	6.25 (5.66 6.91)	< 0.001	3.65 (3.08 4.33)	< 0.001
Household asset index				
Poorest	Reference			
Poor	0.88 (.82 .95)	0,001	0.87 (.81 .94)	<0.001
Least poor	0.65 (.61 .71)	<0.001	0.68 (.62 .75)	<0.001

District Name				
City of Johannesburg	Reference			
City of Tshwane	0.90 (.83 .98)	0,012	0.87 (.80 .95)	0,001
Ekurhuleni	1.06 (.99 1.14)	0,107	0.99 (.92 1.07)	0,748
Metsweding	0.94 (.77 1.14)	0,525	0.77 (.63 .94)	0,012
Sedibeng	1.45 (1.32 1.60)	< 0.001	1.07 (.97 1.18)	0,187
West rand	1.01 (.88 1.16)	0,863	0.86 (.75 .99)	0,037

CHAPTER 4: DISCUSSION

This chapter presents a detailed interpretation of factors associated with disability and disability grant allocation in Gauteng during the year 2007. The overall prevalence of disability in the Gauteng Province was 3,6%, almost close to the 2007 Statistics South Africa estimated disability prevalence of 4% for the whole country (6). The prevalence of disability was high in City of Johannesburg, Ekurhuleni and City of Tshwane districts and low in Sedibeng and West Rand.

4.1 Prevalence of disability in different districts of Gauteng.

There were 4.992 people living with disability in Gauteng in 2007 of which, respectively, 34.93% were living in City of Johannesburg, 26.89% in Ekurhuleni, 19.08% in City of Tshwane, 11.82% in Sedibeng, 5.03% in West Rand and 2.25 % in Metsweding.

This study found that 61% of the 4,493 disabled in the Gauteng Province received a disability grant while a study conducted in the western and Eastern capes found that approximately 71% of disabled participants received grants and gender was not signicantly associated with receiving a grant. Similarly to these findings this study found that 51% of the disability grants beneficiaries were males and 49% were females and there were not a significant difference in the proportion of disability grant allocation (6, 40).

The black population group received more than 80% of the disability grants.

This finding is in line with a previous study that was done in South Africa, which also found that black Africans accounted for a huge majority as disability grant beneficiaries (91).

This study, as found in the previous study, established that older working individuals aged 40 to 64 years received more than half (68%) of the issued disability grant.

4.2 Spatial distribution of disability and disability grant

4.2.1 Spatial distribution of disability

Although the prevalence of disability was respectively high in the City of Johannesburg, Ekurhuleni and the City of Tshwane districts and low in Sedibeng and West Rand, Multivariable analysis showed that living in City of Tshwane, in West Rand and in Metsweding were associated with some lower risk of having any form of disability. One would say, with regard to acquiring any disability, that Metsweding is the safest district in Gauteng. This distribution of disability might be explained by the fact that the districts where the risk is high are districts with a reported high number of injuries due to road accident (92), a huge number of economically productive individuals who are taking risk on daily basis (93) and an increased proportion of neuropsychiatric disorders due to recreational narcotic substances (94).

4.2.2 Spatial distribution of disability grant

This study found that of the total disability grant issued in Gauteng 33.66% went to City of Johannesburg, 28.99% to Ekurhuleni, 18.99% to City of Tshwane, 10.80% to Sedibeng, 4.82% to West Rand and 2.75% to Metsweding.

This study showed that the proportion of the disabled who received a disability grant was similar in all the districts confirming a fair distribution of disability grants. This study also found that a significantly higher proportion of males disabled who received a grant compared to disabled females contrary to what was seen in the Eastern and Western capes in South Africa where a study found that the majority of men and women with disability received the grant whether or not they were living in remote rural or in urban areas (40)

4.3 Relationship between disability and social grants

The results indicated that there was statistically significant relationship between disability and type of social grants ($\chi^2_{(1)} = 3.3e+04$, $p<0.001$)

4.4 Factors associated with disability burden in the Gauteng Province.

4.4.1 Distribution of disability by demographic characteristics

4.4.1.1 Sex

Among the individuals identified as having any disability (4492), there were more males (52%) than females (48%). Among those without disabilities (119320), 49% were males and 51% females . The observed difference was statistically significant (p-value< 0.001) in multivariable analysis (Table 11). This distribution of disability was consistent with a previous study done in the Eastern and Western Cape in South Africa, where reported disability was more prevalent in males (6). Similarly, estimates from Indian and Pakistan indicated that males' disability rates were higher than females rates (63). Furthermore this study has shown that sex was associated with the reported number of disabilities, where females were 40% less likely to report any disability than males. These results contradict the findings of several studies done in Western countries and Japan, where women were more likely to report disabilities compared to males (95-99). This study shows that only Ekurhuleni local municipality has similar findings.

4.4.1.2 Age

Being older than 39 years was associated with a 200% increased risk of reporting any form of disability. These results agree with findings from several studies, where from age 40 and above was associated with a higher risk of reporting a disability from injuries sustained while on duty(95, 100). This may be explained by the active involvement of people of this age category in different, work related, activities, over a long period of time, including a number of different occupational hazards, making them vulnerable to disabilities.

4.4.1.3 Population group

Race was associated with disability whereby coloured and white participants showed a 40% higher risk of reporting any form of disabilities compared to individuals of the black community. These differences were statistically significant in multivariable analysis (table 11). These results agreed partially with the finding of a study done in the United State of America where being white was significantly associated with any form of disability compared to other population groups (98, 101).

4.4.2 Distribution of disability by socio-economic characteristics

4.4.2.1 Marital status

This study found that there were an association between disability and different types of marital status. Widow/widower status (IRR 1.4, CI 1.2-1.6, p <0.001) was at a lesser level associated with a disability, followed by Never Married (IRR 1.6, CI 1.49-1.78, p< 0.001) and Separated (IRR 1,6, CI1.34-2.08, p<0.001). Divorced (IRR 1.9,CI 1.65-2.24, p<0.001) was strongly associated with any disability. These results agreed with the findings of previous studies where it was shown that people living with disabilities experienced extreme challenges in finding or maintaining a marital partner (41, 102, 103).

4.4.2.2 Level of education

Level of education was associated with reported disabilities, whereby individuals who attended a primary school (IRR 0.8, CI 0.76-0.93, p = 0.001) , high school (IRR 0.48, CI 0.44-0.53, p <0.001) and/or post matric/tertiary educational institutions (IRR 0.34, CI 0.27-0.42, p< 0.001), were 20%, 52% and 66% less likely to report disability compared to those with no school at all. This obvious association between individuals who never attend school with a disability may be explained by the fact that the disabled are not given enough chance to attend school.

This study has confirmed previous findings that low levels of education are strongly

associated with disability (6, 59, 75).Similarly, a study done in Canada found that on average, probably from an early age, disabled people were receiving less education and were more likely than others to leave school without a qualification (104, 105).

4.4.2.3 Employment status

Employment status: Participants classified as not economically active were 7.5 times at risk of being disabled (IRR 7.5, CI6.95-8.19, $p < 0.001$). The observed difference was statistically significant. This may be explained by the fact that a great number of disabled never attend school or left school without a qualification. These findings agreed with the results of a study done in Chile, where the conditions of being unemployed were statistically significantly associated with the chance of being disabled (59). This affinity with unemployment-disability stems either from the severity of disability itself or from the lack of active integration of the disabled into the employment market. Eradication of disability or active integration of disabled persons in the working place should be considered.

4.4.2.4 Disability type

Physical disability (43%) was the most common disability followed by emotional (19%) and sight disability (14%). Communication disability was the least common type of disability in the Gauteng Province. Similarly, in Chili, a study found that physical disability was one of the most common types of disability (99). While a study done in developed countries found that disability varied with the respective country's standard of living(106). However, the reasons for the higher number in physical disability particularly in Gauteng were not assessed as the data was limited.

The role of violence and injuries should not be overlooked if we have to address the issue of disability as a province or as a country (107-109).

4.4.2.4 Household asset index and disability

Individual living in the poorest households were more associated with disability compared to those living in poor households(IRR 0.9, CI 0.81-0.94, p <0.001) and least poor households (IRR 0.7, CI 0.62-0.75, p <0.001). This result was in line with previous studies done respectively in South Africa, Malawi, Zambia and Zimbabwe, where households with disabled members had lower standards of living compared to the general population (6, 70, 110). Furthermore, these patterns were not different from findings of the world's richer countries where studies had shown a strong association between poor households and disabilities (6, 58, 60, 61, 71, 111-114). The fact the poorest and poor households are at a greater risk of disability in developed as well as developing countries a global intervention focusing on the conditions of households maybe needed if disabilities are to be eradicated.

4.4 Study strengths

- This study used the national Statistics South Africa dataset to evaluate and determine the burden of disability and factors associated with disability in Gauteng.

- The large number of participants provided the study with a big enough sample to detect differences in risk factors associated with any disability in the province.

4.5 Study limitations;

This study had certain limitations, with the result that care should be taken when interpreting the findings:

- The use of secondary data that was not collected for the purpose of this study made the investigation of some substantial explanatory variables impossible, for example taking into consideration those born disabled or not.
- The current study is not representative of all South Africa but looks only at Gauteng Province
- There were a few non-specified values of the particular variables of household assets and these values were assimilated to them being present.
- The study was limited to only variables included in the South African 2007 Community Survey interview questionnaires.

CHAPTER 5: CONCLUSION and RECOMMENDATIONS

5.1 Conclusion

In conclusion, it was found that for the same 2007 year the overall prevalence of disability in the Gauteng Province was 3,6%, almost close to the Statistics South Africa' estimated disability prevalence of 4% for the whole country.

It was also found that taking into consideration the following categories, namely males aged 40 to 64 years and 65 years and over; the coloured and white population groups, in the City of Johannesburg; living together as married or never married; widower/widow; separated and divorced; never attended school; not economically active and living in the poorest household were statistically significant risk factors associated with disability in Gauteng in South Africa. There was a higher proportion of disabled males who received a grant compared to disabled females. The spatial distribution of grant allocation was proportional to the disability burden per district and per local municipality. There was a statistically significant relationship between disability and social grants allocation.

5.2 Key points

. The prevalence of disability in the Gauteng Province (in Gauteng) was almost close to the 2007 Statistics South Africa estimated disability prevalence for the whole country with the City of Johannesburg Metropolitan and Ekurhuleni Metropolitan sharing almost two-thirds (62%) of the burden. Further studies are required to identify the reasons of disability in these two local municipalities.

. There were more females disabled than males disabled in the Ekurhuleni local municipality compared to others municipalities.

. Individuals of an "older working age" (40 to 64 years) had three times higher risk of becoming disabled compared to younger working age (18 to 39 years) individuals.

. The disabled were given less of a chance to receive an education and fewer opportunities in the work market.

. There was a 1.9 more risk for a disabled person to be divorced and the female sex was the most affected in this regard.

. Poorest households were more affected by disability as compared to others.

. Sedibeng was the district with the highest risk of disability whilst Metsweding

had a 20% lower risk of disability.

5.3 Summary and recommendations

In summary, this study provided new information to policy-makers in that they should be aware that the older working individuals aged 40 to 64 years are more affected by disability and measures aiming at preventing disability should become priority.

The implications for the policy-makers and government, as well as researchers, to identify and understand the cause of disability, particularly in Sedibeng and the City of Johannesburg Metropolitan will be possible. Adequate resources should be allocated for the promotion, prevention and public education on the different, preventable causes of disability.

The eradication of disabilities, by working on the different causes, will certainly lessen the relationships observed between disability and all associated factors. This should be the next public health challenge.

These findings have broader implications for the government, particularly for the social department and the public health policy commitment to fair intervention measures, with the same right and access to quality education, employment opportunities, households' quality of life , road safety and more importantly, to the eradication of disability.

Appendix A: Ethics clearance certificate for "Disability in Gauteng, South Africa: Levels, Distributions, Grant Allocations and Predictors.

M130816

M130816M130816

R14/49 Dr Mpinda Beya

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)

CLEARANCE CERTIFICATE NO. M130816

NAME: (Principal Investigator)	Dr Mpinda Beya
DEPARTMENT:	School of Public Health Medical School
PROJECT TITLE:	Disability in Gauteng, South Africa: Levels, Distributions, Grant Allocations and Predictors (2007)
DATE CONSIDERED:	30/08/2013
DECISION:	Approved unconditionally
CONDITIONS:	
SUPERVISOR:	Benn Sartorius
APPROVED BY:	Professor PE Cleaton-Jones, Chairperson, HREC (Medical)

DATE OF APPROVAL: 30/08/2013

This clearance certificate is valid for 5 years from date of approval. Extension may be applied for.

DECLARATION OF INVESTIGATORS

To be completed in duplicate and **ONE COPY** returned to the Secretary in Room 10004, 10th floor, Senate House, University.

I/we fully understand the conditions under which I am/we are authorized to carry out the above-mentioned research and I/we undertake to ensure compliance with these conditions. Should any departure be contemplated, from the research protocol as approved, I/we undertake to resubmit the application to the Committee. **I agree to submit a yearly progress report**.

PLEASE QUOTE THE PROTOCOL NUMBER IN ALL ENQUIRIES

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