IN THE FIELD OF EPIDEMIOLOGY AND BIOSSTATISTICS

IN PARTIAL Fulfilment of the Requirements for the
Degree of

Sciences, University of the Witwatersrand, Johannesburg,

A Research Report Submitted to the Faculty of Health

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Surveillance Site in 2003, South Africa

IN THE AGINCOURT HEALTH AND DEMOGRAPHIC
CHILDHOOD MORTALITY AND SOCIOECONOMIC STATUS
I, DIDER BAKARBA KAPKU, declare that this research report is my own original work. It has not been submitted before in part or in full for any degree or examination at this or any other University. To the best of my knowledge, it has not been submitted for the degree of Master of Science (Medicine) in Epidemiology and Biostatistics of the University of the Witwatersrand, Johannesburg. 

DECLARATION
To God be the Glory

DEDICATION
ABSTRACT

In the Agincourt Health and Demographic Surveillance Site in rural South Africa, we assessed the effect of low socioeconomic status on childhood mortality and demonstrated surveillance site. The results of this study were consistent with previous studies that showed no association of wealth index with mortality for infants, but a positive correlation of wealth with mortality for children aged 1-4 years (OR = 0.28, 95% CI 0.09-0.80). The observed association was consistent across all age groups and wealth categories. The results of this study provide evidence for the need for targeted interventions to reduce childhood mortality, particularly among the poorest. We concluded that interventions aimed at reducing child mortality should be targeted to those in the lowest wealth quintile.
University of the Witwatersrand possible.

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NOMENCLATURE
Childhood Mortality and SES in the Aforfront HDS in 2003, South Africa

Strata were included in the 1970 round of census and subsequently, with the hope that
on household characteristics or possessions conceptualized to reflect the socioeconomic
standard of living (UNDP) (Bayes and Zuber, 1, 2004).

acquisition of knowledge in terms of level of literacy and access to resources for a decent
level of the HDI (Human Development Index) (HDI), which in principle also emphasizes the basic needs approach (Bayes and Zuber, 1997).

During the same year, the United Nations suggested the use of human development index

such as freedom of choice, the quality of the physical environment (Sen, 1985, 1987) and
as a measure of well-being and advocated a basic needs approach using social indicators
bank of people. In addition, he has been very critical of the undue emphasis on income
happiness, utility, and choice: the ultimate objective beyond this was to enhance the well-
ence, HDI (1978). In 1960, it was discovered that the per capita Gross National Product
product (Bayes and Zuber, 2004). Nevertheless, these measures have been found to be problematic in measuring economic growth at the micro-level because of their inability
to capture adequately at the individual and household level the notion of well-being

T. 1. Introduction

Aims and Objectives

Chapter One: Introduction and Literature Review,
2004).

Studies by creating a composite index of socio economic status (Bawum A and Zuberi T., 2004) examine the effect of each variable separately or none, together as socioeconomic status variables for demographic analysis. These different approaches depend on relation between the particular variable and the outcome of interest. However, other researchers consider as economic status or are important to have direct effect on mortality. Bawum A and Zuberi T. (2004) Various approaches are used by different researchers in their use of these variables. Video, and television, like radio, 8mm, poultry and pigs are other resources of income. Land, source of water used and household assets like stove, construction type of toilet facilities, source of water used and household assets like stove, household characteristics and possessions on different demographic outcomes.

Many demographic inequities are full of studies demonstrating the significance of A and Zuberi T. (2004) as an alternative to different indicators of household’s level of economic well-being (Bawum A and Zuberi T., 2004). These variables can be used either individually or sources: Bawum A and Zuberi T. (2004). These variables are likely to be introduced into models. The basic idea behind this is that households with piped-borne water, water closer (WC) in different communities Bawum A and Zuberi T. (2004).
Childhood Mortality and SES in the Agricultural HESS in 2003, South Africa

South Africa during the apartheid era.

Urban and rural areas with many black areas without a hospital or all hospitals were generally equipped and run by staff and ample funds while black hospitals were generally run by the private sector, whose services were minimally reimbursed. Health care was provided through health centers that were separate for whites and blacks. Education was segregated with white education higher and more equal with each black workforce in use when working for whites. This situation was common and widespread.

South Africa during the apartheid era. Within this system, occupational opportunities were reduced and unequal with white disparities in income between different racial groups. This system created a society of inequalities.

During the 1960s and 1970s, 3.5 million of blacks were removed from the cities to work on the land in the country. The country was divided into four racial groups: black, colored, Indian, and white. This system was legally established in 1948. South Africa is a southern African country marked by its history of extreme racial
and Development Programme (RDP).

The framework for socioeconomic development in a special programme called Reconstruction and Development Programme (RDP) since 1994 by the Democratic Government of South Africa has developed a new policy on child mortality and disease. The majority of whom were blacks in rural areas (National Institute for Economic Policy).

At the end of the system, in 1994, 33% of South Africans lived in poor households, identified as an important and largely preventable cause of death.

Among blacks in some urban areas, the infant mortality rate fell from 12.7 deaths per 1,000 live births (IMR) dropped from 22 to 13 over the same period. The IMR fell from 12.7 deaths per 1,000 live births to 5.6 over the period from 1970 to 1983, while for whites the infant mortality rate (IMR) for coloured declined from the 1.35 deaths per 1,000 live births in 1970 and 1980 significantly higher risk for nonwhites. Initial Infant Mortality Rate (IMR) for coloured declined from the 1.35 deaths per 1,000 live births in 1970 and 1980 significantly higher risk for nonwhites. Studies across South Africa have shown that life expectancy at birth is lower in rural areas than in urban areas. The Institute of Health and Development has been shown to affect children's health and survival in South Africa. The Institute of Health and Development has been shown to affect children's health and survival in South Africa. The Institute of Health and Development has been shown to affect children's health and survival in South Africa.
Childhood Mortality and SES in the AfriPunt HIDS in 2003, South Africa

1.3. Motivation of the study:

The general well-being of children (Klassen, 1992) contributes to the health of infants. In a specific area, the IMR is a good reflection of community development and education, access and quality of health services are factors. Communities (Sachs and Tatem, 2004) socioeconomic status of families, level of community health status and development within districts, provinces and between communities. These indicators are used as sensitive and although not specific way of assessing the health status of communities, districts and countries (Bradshaw, 1996).

Initial mortality rate (IMR) and under five mortality rate (U5MR) are key indicators for system and community.

Despite the Primary Health Care (PHC) principles, decentralization of District Health enable all South Africans citizens to achieve the optimal levels of health and well-being in all key areas and sectors. It proposed into health services reconciliation in order to population in South Africa by setting up broad principles and strategies for development in addition to its major thrust to build the economy that will address the poverty issue in October 1995. Household Survey (OHS) poor people in South Africa according to the 1995-99, October Household Survey (OHS) poor people in South Africa.
Childhood mortality and SES in the Afrobarometer HDS in 2003, South Africa

decreased childhood mortality.

improved the socioeconomic status of families and possible consistency towards the government to increase the socioeconomic status of poor families should have

socioeconomic status in South Africa in general. The effects of the South African springs. Previous studies showed a relationship between childhood mortality and

(AYDHS) as the AFRICA Health and Demographic Surveillance Site
(Lynne R et al. 2007). The African Health and Demographic Surveillance Site

those in lower income households in an attempt to support child growth and development

African government introduced the child support grant (CSG) in April 1997 to target

in an attempt to reduce the scale of poverty and meet the needs of the poorest, the South

vulnerable to socio-economic stresses that influence their standards of living and well-being.

health care and shelter). Also children as in the whole South Africa are particularly

HIV/AIDS and lack of basic facilities (including water, food, electricity, education, and

areas, poverty conditions are in.html the expected by the growing epidemics of

estimated at 40 to 50% (Collinson MA et al., 2002) As in other South African rural

development in the former Bantu homeland the today scores high in poverty within unemployment

The Afrobarometer sub-district of South Africa is largely rural. Limpopo province was part of

(Woodland Inquiry, 2002)

according to the 1996, South African household surveys the poorest provinces in South Africa

the small cities and 13% in metropolitan areas. Also Eastern Cape and Limpopo are

62% of the rural population is poor compared to 32% of those in small towns, 21% in
(Sandefur et al., 1999) and Cosma Rica (Fame et al., 1998). Child mortality is closely associated with improved child survival in Nigeria (Caldwell, 1979). In Nicaragua, increased socioeconomic status correlates with higher levels of education and better child survival. Increased type of residence was found to be more associated with child survival. Furthermore, Caldwell, et al., found that mothers and husband's education, along with type of residence, were most in urban and rural areas. Similarly, focusing on twenty-first develop and countries mostly in Asia and Latin America, Caldwell (1994) found that more than one-third of deaths of children under the age of five (WHO, 1998). The most affected region around the developing world is Sub-Saharan Africa and accidents. For more than one-third of deaths of children under the age of five in Sub-Saharan Africa, the IMR and IMR respectively the probability of death before age one and the probability of dying before age one and the IMR/LMR and LMR respectively the probability of death between birth and five and the LMR. Child mortality and child mortality (Caldwell, et al., 1984; Caldwell, 1979). More previous studies around the world have shown a close relationship between socio-economic status and child mortality (Caldwell, et al., 1984; Caldwell, 1979). Child mortality and child mortality (Caldwell, et al., 1984; Caldwell, 1979). More previous studies around the world have shown a close relationship between socio-economic status and child mortality (Caldwell, et al., 1984; Caldwell, 1979).
Childhood mortality and SES in the AfriGOLD HIDS in 2003, South Africa

Mortality rates are significantly higher in areas where poor environmental conditions exist. A study by the AfriGOLD HIDS generally showed that where poor sanitation practices were in use (Loeff, 2003), in addition, the child mortality rate was 7.7 per 1000 compared to 3.4 per 1000 where other sanitation practices were in use. Where flush toilets were in use, the child mortality rate was 4.3 per 1000, and where the source of drinking water was other than piped water and shared UDMR (water, sewerage, and energy), the child mortality rate was 5.9 per 1000. This survey showed that UDMR, if the mother attained secondary education and if the family used improved water and sanitation facilities, the child mortality rate was consistently higher in non-urban than in urban areas. Health surveys (SADHS) showed that UDMR was consistently higher in non-urban than in urban areas. This was consistent with other studies that found a close relationship between socioeconomic status and child mortality. The 1999 South African Demographic and Health Survey (SADHS) showed that UDMR was consistently higher in non-urban than in urban areas. As of 2018, 70% of the population in South Africa used improved water sources. A study in Zimbawe, Zambia, and Zimbabwe (Waldman and Chinasi, 2000) showed that the lowest socio-economic status index (Covarrubias, 1999) using data from Tanzania found that the chances of childhood mortality decreased consistently with higher levels of the socio-economic status index. Van Zyl and Zilgen (2004) showed that the socio-economic status index
Childhood Mortality and SES in the Afroean HROS, 1993, South Africa

1.6. Study Objectives

1.6.1. Main Objective

1.6.2. Specific Objectives

- To investigate whether there is an association between the childhood mortality and wealth index.
- To describe the wealth index scores in the Afroean Health and Demographic Surveillance Site.
- To understand the association between socioeconomic status and childhood mortality in the Afroean Health and Demographic Surveillance Site, 2003.

1.5. Keywords and Variables of Interest

- Socio-economic status (SES): Characteristics of economic, social, and physical environment in which individuals live and work, as well as demographic characteristics.
- Government to assist poor families.
- Child support grants (CSG): a type of grant introduced by the National Government expressed by 1000 live births.
- Under-five mortality rate (U5MR): the probability of dying between birth and age 5 expressed by 1000 live births.
- Infant mortality rate (IMR): the probability of dying before age one expressed by 1000 live births.
Krn x 16 km at its widest points (Khan K et al., 2007).

The altitude is 400-600 meters above sea level. It covers 390 sqkm (polygon 355
and 31025). Cultivation and livestock farming are the main economic activities in the area.

Homeland. It is estimated that the population of the area is concentrated in the
BoshwachEric 2007 region. This place was under the control of the apartheid system in 1994.

Located about 500 km northeast of Johannesburg in the Afriquen sub-district of the
Afriquen Health and Population Unit (AHPU), is a research initiative of the University
of the Afriquen Health and Demographic Surveillance. She is the foundation of the

2.2. Study area

Surveillance. She...

2.1. Study design

CHAPTER TWO: MATERIALS AND METHODS
Childhood Mortality and SES in the Afriamont, HIS, 2003, South Africa

Map 1. The localization of the Afriamont field site (Collinson MA, 2000)

...people hold a mixture of indigenous and Christian beliefs (Collinson SW et al., 1999).

The area has mainstream Christian churches and independent African churches, and

affiliated with the South African host population.

Population. Both groups are Zoonse-speaking, and the Mozambicans are culturally

referred to collectively as the Shangaan, although this term is predominantly used

of the rural communities (Kruger K et al, 2007). The main ethnic group is the Shangaan, although

the total population is 70,000 with 11,000 households and a population density of 174.
 Childhood Mortality and SES in the Arficoni HDSS in 2003, South Africa

or by wheelbarrow. Roads are unpaved and the public transport is limited to a single
dwelling with tin or hecd roofs. Women and children collect water manually on the head.

There are different types of housing ranging from the traditional mud huts to brick

hieray, which is estimated to be 62% (Tolhun SM et al, 1999).

secondary school. The female adult hierarchy (96%) is lower compared to male adult
almost all have attended primary school, but only 46% have made the transition to
40% of adults 25-59 years old received formal schooling. Of those 15-24 years old,

Each village has at least one primary school. About the education in this area, more than
Pensions are an important source of income for many families (Tolhun SM et al, 1999).

Women and men are employed and commercial farms and informal businesses.

The unemployment is estimated at 40-50%. The formal sector unemployment involves

Map 2: A view of the Arficoni HDSS Field Site Area (Ken Schantz, 2003)
Our study population comprises all children under the age of five years residing in the province of Matabeleland South, Zimbabwe, at the time of the 1998 Malaria Indicator Survey (MIS). The study population includes both boys and girls and is representative of the general population of children under the age of five years. The MIS was conducted in 1998 and involved the collection of data on various health and demographic indicators for children and their households. The data collected includes information on child mortality, morbidity, and health-seeking behaviors.

2.3 Study population and sample size

and nutritional status, maternal and child health, and child mortality. The study population includes all children under the age of five years residing in the province of Matabeleland South, Zimbabwe, at the time of the 1998 Malaria Indicator Survey (MIS). The MIS was conducted in 1998 and involved the collection of data on various health and demographic indicators for children and their households. The data collected includes information on child mortality, morbidity, and health-seeking behaviors.

At the time of the MIS, the prevalence of malaria in children under the age of five years was estimated to be approximately 30%. The study population includes both boys and girls and is representative of the general population of children under the age of five years. The MIS was conducted in 1998 and involved the collection of data on various health and demographic indicators for children and their households. The data collected includes information on child mortality, morbidity, and health-seeking behaviors.

According to the WHO, the main causes of death among children under the age of five years in Zimbabwe are malaria, respiratory infections, and neonatal sepsis. The prevalence of malaria in children under the age of five years was estimated to be approximately 30% in 1998, and the study population includes both boys and girls and is representative of the general population of children under the age of five years. The MIS was conducted in 1998 and involved the collection of data on various health and demographic indicators for children and their households. The data collected includes information on child mortality, morbidity, and health-seeking behaviors.

The main causes of death among children under the age of five years in Zimbabwe are malaria, respiratory infections, and neonatal sepsis. The prevalence of malaria in children under the age of five years was estimated to be approximately 30% in 1998, and the study population includes both boys and girls and is representative of the general population of children under the age of five years. The MIS was conducted in 1998 and involved the collection of data on various health and demographic indicators for children and their households. The data collected includes information on child mortality, morbidity, and health-seeking behaviors.

In conclusion, the MIS provides valuable information on the health and demographic status of children under the age of five years in Zimbabwe, and the study population includes both boys and girls and is representative of the general population of children under the age of five years. The MIS was conducted in 1998 and involved the collection of data on various health and demographic indicators for children and their households. The data collected includes information on child mortality, morbidity, and health-seeking behaviors.
Childhood Mortality and SES in the Amaquela HDSS in 2003, South Africa

A system of checks was introduced to the fieldworker for screening, and, where necessary, a
situation. The checks became more detailed as the form progressed through the
organization. The checks became more detailed as the form progressed through the
husbands' comments, and other
and possible reasons determined. From these data, quality could be assessed, and other
concluded after differences between the first and the second interviews were identified.

After each interview, a constructive feedback was given to the fieldworker in order to
improve his interview skills. After a given explanation, the entire interview was
conducted again. Differences between the first and the second interviews were identified,

The supervisor conducting random duplicate visits.

The fieldworker and observer a number of interviews done by the fieldworker
collected in the field. During these visits, the supervisor goes into the field with the field
Supervisors and random duplicate visits are conducted to ensure the quality of the data.

2.4.2. Assessment of data quality

During evenings and on weekends, with a high placed at two revisions per household.
If appropriate respondents were unavailable, the fieldworker undertook revisions, usually
have occurred since the previous census recorded, and any changes observed are updated.
visited and checked individual information for every household member. All visits that
the fieldworker interviewed the most knowledgeable respondent available at the time of the
rounds are generally conducted from July to November. During the visit, a revised lay

Several census rounds have been completed to date with a baseline one in 1992.

2.4.1. Data collection

2.4. Data Source
Interviews with health workers and community (Tolmay SM et al., 2007)

Conducting surveys and had demonstrated the ability to conduct a verbal autopsy

To ensure common cultural background with the local community health workers were

pertaining illness as respondent (Khan & el al., 2007).

verbal autopsy selecting the person most closely associated with the deceased during the

In each household where death had been recorded, trained healthworkers conducted a


procedures and the multiple process used (Khan & et al., 2000; Chadman 1994)

the cause of death in the community, and in the second part by the questionnaire.

Phenomenes were determined in two different parts. In the first part, they were determined by

and reported by lay respondent (Khan & el al., 2000)

distinguish most causes of death, and then these can be accurately recognized. recalling

2000). The verbal autopsy is based on the assumption that the signs and symptoms can

illness, reported retrospectively by a close caregiver of the deceased (Khan & el al.,

This technique relies on clinical assessment of signs and symptoms during the terminal

The verbal autopsy (VA) was used to determine the probable cause of death in Afghanistan.

2.4.3. The Verbal Autopsy

ei al., 2002).

review was done. Supervisors kept track of forms, using printed checklists (Collisonen MA
2.4. The assessment of the socioeconomic status in the Agincourt

Health and Demographic Surveillance Site

The assessment was described as "understanding" (Krishna et al., 2000). Death was described as "unrecognized" (Krishna et al., 2000). When the cause of death was recognized, the death was accepted. Where no cause of death was recognized, if two of three doctors corresponded, the death was accepted; if not, an additional medical practitioner made a further check and independent assessment. If the same diagnosis was reached, this was accepted as the probable cause of death. Each completed questionnaire was reviewed independently by two medical practitioners. A child's socioeconomic status was determined based on their household economic status, education, and lifestyle practices. Further sections address use of modern and traditional health services, and lifestyle practices.ency of the particular symptoms (Krishna et al., 2000). Further sections address use of
Childhood Mortality and SES in the Adolescent HIDS in 2003, South Africa

The poor and the less poor children (and the higher class (comprising the least poor respectively the lower (comprising poorer and very poor children), middle (comprising the less poor) and upper (comprising the wealthier) classes) were divided into quintiles that then represent proxies for socioeconomic status (Ewerter et al., 2002).

In this study, we decided to categorize the wealth index into three different classes based on this equation the wealth index of households were assigned to the residuals of the mean and the standard deviation of asset (or service) (Ewerter et al., 2002).

\[ W = \frac{(x_1 - \mu_1)^2 + \ldots + (x_n - \mu_n)^2}{\sigma^2} \]

Where \( W \) is the scoring factor or weight for the first asset (or service), \( x \) is the variable with the largest eigenvalue, with the larger eigenvalues were used to develop an index based on the

The results obtained from the first principal component (explaining the most variance) were then processed in order to obtain weights and principal components, which is an eigen-based principal variable (Ewerter et al., 2002). Hence, the use of principal component analysis (PCA).

Methods of analysis

2.5. Data analysis
Ethical Considerations

2.6. Ethical Considerations

Socioeconomic index and the statistical analysis.

2.5.2. Statistical tools

above, the total number of siblings in the household and parent education status.
3.1. Description of the Wealth Index Obtained
Childhood Mortality and SES in the Adolescent HESS in 2003, South Africa

Children were Mzamabane. Mothers were on average 26.1 (SD 7.5, range 12.5-49.9) years old at birth. Overall, 64% of children were born at home, while 36% were born in hospitals. Mother's education level was low, with only 10% having completed secondary school. Half of the children were boys.

Six percent of children had a birth weight less than 2.5 kg while 94% had a birth weight greater than 2.5 kg. Sixty-five percent of children were less than 2.5 kg. Among those who died in 2003, 71 were aged less than one year (40 males, 31 females). The mean age of children was 30.4 years.

Table 1 describes selected characteristics of the study population for all children, infants, and children aged 1 to 4 years. Table 2 describes selected characteristics of the study population for children aged less than 5 years.

3.2 Description of the study population

(Appendix 7)

Table 7 shows the characteristics of younger children aged less than 5 years by wealth index category. Children in the wealthiest category were more likely to have been born at home, have a birth weight greater than 2.5 kg, and be male. Children in the middle category were more likely to be male and have a birth weight less than 2.5 kg. Children in the poorest category were more likely to have been born at home and have a birth weight less than 2.5 kg.

(Appendix 8)

Children living in households classified in wealth index categories I, II, and III were more likely to have access to electricity, water, and sanitation facilities. Children living in households classified in wealth index categories I, II, and III were more likely to have access to education facilities. Children living in households classified in wealth index categories I, II, and III were more likely to have access to health care facilities. Children living in households classified in wealth index categories I, II, and III were more likely to have access to transport facilities.

(Appendix 9)

Notes: The figures in Table 7 are unweighted. The population of younger children aged less than 5 years was calculated by summing the number of children in each wealth index category. The population of children aged 1 to 4 years was calculated by summing the number of children in each wealth index category. The population of children aged 5 to 9 years was calculated by summing the number of children in each wealth index category. The population of children aged 10 to 14 years was calculated by summing the number of children in each wealth index category.
TABLE 1: Characteristics of 7531 children residing in the Agincourt HDS in 2003 (%)

<table>
<thead>
<tr>
<th>Variable</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>7531</td>
</tr>
<tr>
<td>Female</td>
<td></td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td></td>
</tr>
<tr>
<td>Widowed</td>
<td></td>
</tr>
<tr>
<td>Divorced</td>
<td></td>
</tr>
<tr>
<td>Remarried</td>
<td></td>
</tr>
<tr>
<td>Educational level</td>
<td></td>
</tr>
<tr>
<td>No education</td>
<td></td>
</tr>
<tr>
<td>Primary</td>
<td></td>
</tr>
<tr>
<td>Secondary</td>
<td></td>
</tr>
<tr>
<td>Tertiary or university</td>
<td></td>
</tr>
<tr>
<td>Employment status</td>
<td></td>
</tr>
<tr>
<td>Employed</td>
<td></td>
</tr>
<tr>
<td>Unemployed</td>
<td></td>
</tr>
<tr>
<td>Housing condition</td>
<td></td>
</tr>
<tr>
<td>Slum</td>
<td></td>
</tr>
<tr>
<td>Non-slum</td>
<td></td>
</tr>
</tbody>
</table>

A male and only one by a female headed single female head of household.

Twenty-six percent of the children were orphans, twenty-two percent of parents were married, and thirty-six percent of parents were married to each other. Thirty percent of parents were employed, and twenty percent of parents had completed secondary education. Twenty-four percent of parents did not attend school. Fifty-four percent had a primary education, and twenty-two percent had a higher education. The children were on average 7.2 years old at birth.
### Table 2: Mortality rate of children aged less than one and one to four years in per 1000 person-years (Table 2)

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Mortality Rate of Death</th>
<th>1-4 Years</th>
<th>5-9 Years</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1176</td>
<td>117</td>
<td>1183</td>
</tr>
<tr>
<td>1-4 years</td>
<td></td>
<td>5946</td>
<td>15</td>
<td>5961</td>
</tr>
<tr>
<td>5-9 years</td>
<td></td>
<td>798</td>
<td>72</td>
<td>870</td>
</tr>
</tbody>
</table>

The table shows the mortality rate of children aged less than one and one to four years, in South Africa in 2003, by age group.

3.3.1. Overall and cause-specific mortality

3.3. childhood mortality in the Agincourt HDS in 2003
Figure 2: Distribution of main cause of death of 117 children in the Agincourt Health and Demographic Surveillance Site in 2003, South Africa.
Figures 3: Main cause of death of 71 children aged less than one year in the

[Diagram showing cause of death and number of deaths]
Considerably lower for wealth index category I and II. For children aged 1 to 4 years, mortality rates for wealth index category III were considerably higher than for those classified in wealth index II and III. For infants, the mortality rates for those classified in the lowest wealth index category Mortality rates were observed to decrease with increasing wealth index value.

### 3.3.2 Overall mortality by wealth index categories

**Figure 5**: Presentation of cause of death per wealth index categories in the AfriCoint Health and Demographic Surveillance Site in 2003, South Africa.
was associated with childhood mortality using the wealth index both as a continuous and
categorical variable in a univariate and multivariate analysis.

We subsequently conducted a logistic regression analysis to assess whether wealth index

Demographic Surveillance Site.

children aged under five years in the Agincourt Health

<table>
<thead>
<tr>
<th>Wealth Index</th>
<th>Mortality Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highest Wealth Index</td>
<td>1%</td>
</tr>
<tr>
<td>Lower Wealth Index</td>
<td>10%</td>
</tr>
</tbody>
</table>

Table 4: Association of mortality with wealth index status and mortality of children aged under five years in the Agincourt Health and Demographic Surveillance Site in 2003, South Africa.

<table>
<thead>
<tr>
<th>Wealth Index</th>
<th>Mortality Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highest Wealth Index</td>
<td>1%</td>
</tr>
<tr>
<td>Lower Wealth Index</td>
<td>10%</td>
</tr>
</tbody>
</table>

Table 4: Mortality Rates by Socioeconomic Status and Child Age in the Agincourt Health and Demographic Surveillance Site in 2003, South Africa.
of siblings in the household, the age, birth weight and breast-feeding status of the child more likely were maternal status of parent, the mother's status (alive or dead), the total number of children ever born to the mother, and the gender of the child. Further factors associated with childhood mortality were maternal status of parent, the mother's status (alive or dead), the total number of children ever born to the mother, and the gender of the child. Further factors associated with childhood mortality were maternal status of parent, the mother's status (alive or dead), the total number of children ever born to the mother, and the gender of the child. Further factors associated with childhood mortality were maternal status of parent, the mother's status (alive or dead), the total number of children ever born to the mother, and the gender of the child.

We have used this tool to classify children in the highest wealth index category to be significantly less likely to have died in 2003 compared to those classified in the lowest wealth index (OR 0.88; 95% CI 0.81-0.95; P = 0.003). Using wealth index as a continuous variable, we found no association between wealth index and child mortality. In a univariate logistic regression using the wealth index as a continuous variable, we found no association between wealth index and child mortality. In a univariate logistic regression using the wealth index as a continuous variable, we found no association between wealth index and child mortality. In a univariate logistic regression using the wealth index as a continuous variable, we found no association between wealth index and child mortality.
Childhood Mortality and SES in the Agincourt HSS in 2003, South Africa

Table 5: Adjusted for all other variables in the model.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Value 0.000</th>
<th>Value 0.001</th>
<th>Value 0.005</th>
<th>Value 0.010</th>
<th>Value 0.050</th>
<th>Value 0.100</th>
<th>Value 0.250</th>
<th>Value 0.500</th>
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</thead>
<tbody>
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<td>Maternal age at birth</td>
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<td>0.001</td>
<td>0.005</td>
<td>0.010</td>
<td>0.050</td>
<td>0.100</td>
<td>0.250</td>
<td>0.500</td>
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<td>Educational attainment</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Number of siblings</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Household head</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Income</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>Foetal anomaly</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>Birth weight</td>
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<td>Yes</td>
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<td>Yes</td>
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<td>Yes</td>
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</tr>
<tr>
<td>Mother's education</td>
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<td>Yes</td>
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<td>Yes</td>
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<td>Father's education</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Maternal education</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Household education status</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>Yes</td>
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<td>Number of children</td>
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<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Identification next page

Table 5 continued...
Childhood Mortality and SES in the Agincourt HIDS in 2003, South Africa

In the agincourt, childhood mortality is associated with wealth index. In 2003, it was observed that wealth index was significantly associated with childhood mortality in a fully adjusted model. In 2006, compared to those in the wealthiest category, children in the poorest category were at a higher risk of death (OR 0.43, 95% CI 0.29 - 0.62; p=0.010).

Further factors significantly associated with childhood mortality in a fully adjusted model included household size, gender, and whether the child was breastfed. Children who were breastfed had a lower risk of death (OR 0.57, 95% CI 0.39 - 0.84; p=0.007). The wealth index was significantly associated with childhood mortality. In the multivariate analysis, a wealth index was also included, and it was found that the wealth index was significantly associated with childhood mortality.

Those variables with a p-value less than 0.15 were selected for inclusion in the multivariate analysis. In a multivariate analysis, including age, gender, and wealth index, we observed a significant association between wealth index and childhood mortality.
Over all, we observed that the association between wealth index and childhood mortality remained statistically significant after multivariate adjustment.

<table>
<thead>
<tr>
<th>Rank</th>
<th>0-1.9%</th>
<th>2-3.9%</th>
<th>4-5.9%</th>
<th>6-7.9%</th>
<th>8-9.9%</th>
<th>10%</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td>0.000</td>
<td>0.000</td>
<td>0.000</td>
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<td>0.000</td>
</tr>
</tbody>
</table>

Table 6: Multivariate analysis for children under one and one to four years residing in the Agincourt HDS in 2003.
4.2 Socioeconomic status and risk factors of childhood mortality

We examined the relationship between socioeconomic status and childhood mortality in the Agincourt Health and Demographic Surveillance Site in 2003. We utilized both logistic regression and multivariable analysis to understand the association between socioeconomic status and childhood mortality. Our main objective was to identify the most vulnerable members of the community in terms of socioeconomic status and childhood mortality. In the current study, we explored the relationship between socioeconomic status and childhood mortality using basic indicators of country's socioeconomic level and quality of life. In the current study, we explored the relationship between socioeconomic status and childhood mortality using basic indicators of country's socioeconomic level and quality of life.
Although breastfed and Heuwel, 2000: Stein et al., 2000) and can be attributed to
mortality were still alive as reported above in consistencnt with results obtained in other
The high mortality of children who had deceased mothers compared to those whose
mortality than those not breastfed (OR: 6.00, 95% CI: 3.41-11.99).
(OR: 0.76, 95% CI: 0.37-1.37). Results also showed that breastfed children had lower
than 2.50 kg had lower chance of survival compared to those with more than 2.50 kg
compared to infants (OR: 0.85, 95% CI: 0.52-1.38). Children who had a birth weight of less
55% CI: 0.20-0.89) especially for infants. Older children had a higher survival chance
the household appeared to be significantly associated with lower mortality (OR 0.43);
compared to children with their mother alive (OR: 1.35, 95% CI: 1.35-1.69). The number of siblings in
those with their mother alive (OR: 1.35, 95% CI: 1.35-1.69). The number of siblings in
mortality. Children who had deceased mothers had lower chance of survival compared to
showing the lowest under these mortality and the lowest class under the
under the mortality in the Agenoort study with the highest socioeconomic status
Tolman and colleagues in 2001 found the socioeconomic status to be correlated with
(Scheltenbroek, 1999, 2003; Khen K et al., 2000; Beunker M et al., 2002).
Compared to previous studies that focused on the association between socio-economic
and breastfeeding status of the child.
other factors associated with childhood mortality in the current study were the mother
being 0.43 less likely to die in 2003 compared to those in the wealth Index category III
Category or
Classification of wealth Index status showed children in the wealth Index III category had
4.3. Number of deaths and cause of deaths

Breastfed children were found to have lower child mortality rates and this was consistent with our findings and can be explained by the HIV/AIDS pandemic. In the first year of life, HIV/AIDS was the leading cause of death. Previous studies revealed that mortality in the first year of life was higher compared to subsequent years and this is consistent with our findings (Kovacs et al., 2000). However, the number of siblings was also associated with child mortality. Previous studies by Broderick and Hewson revealed that children without older siblings (at least 10 years) had higher mortality than those with at least one. Makapepe and colleagues argue that higher mortality was not due to inadequate care and inadequate feeding, but due to the pandemic that causes a lot of death among mothers of children in the middle of the HIV/AIDS epidemic. No breastfeeding or feeding, the reduction in care and the HIV/AIDS pandemic may contribute to higher mortality.
ARTICLE

Children's Mortality and SES in the Agincourt HIPC in 2003, South Africa

ARTICLE

Conclusions

Levels of poverty and can therefore not be generalized to the whole population of South Africa. The majority of the population are based, including the sub-population with the highest levels of poverty, and can only represent former household settlements in South Africa where about 40% misclassification.

MISCLASSIFICATION

Missing values could have introduced recall bias and subsequently lead to

Misclassification. The cause of death collected retrospectively from cause of death using verbal

Therefore, we used the "wealth index", as a proxy of SES instead of using a "real" SES. These variables listed above were not included in the SES variables, residents' fathers and linked temporary migrants' fathers, and non-resident fathers, which is

as their children. The father data could therefore be biased because if respondents co-

were due to residence issue, as many additional fathers do not live in the same household

missing values that did not allow constructing a "real" SES values. These missing values

such as father education, paternal work status, the place of residence, and family size, a lot of

The data used contained a considerable amount of missing values. Some variables

relationships due to the assessment of exposure and outcome of interest simultaneously.

The current study presents some limitations. We could not establish a conceptual

4.4 Limitations of the study

with many diseases. (Samuel Jc et al., 2007).

Misclassification in the determination of cause of death due to the association of AIDS

However, these results should be interpreted with caution. Differentiation between AIDS
present in each one of the multiple indicators.

The advantage of capturing the latent essence of socioeconomic status that is assumed

by qualitative and quantitative approaches. The technique used (PCA) has

intercorrelations and explained by qualified medical officers. The technique used (PCA) has

dealt cases were ascertained by a verbal autopsy conducted by well-trained field

workers from a demographic system that is relatively representative for the local population.

The data used in the current study were extracted from a large comprehensive database

4.5. Strengths of the study
5.1 Conclusion

CHAPTER FIVE: CONCLUSION AND RECOMMENDATIONS
5.2 Recommendations

Data are prospective and longitudinal. In the future using longitudinal data in order to address this question in the African context.

Initial study design for this research report. However, we recommended also further studies. Finally, the data used for this research report were cross-sectional and thus provided an

Limited

residential status of father and mother and which can be done despite the current data

affect both childhood mortality and SES, we recommended a future study that will control the

Due to the fact that findings derived elsewhere are an important residence category that may

survived of under five years old in rural South Africa (Twere et al., 2007).

a need of improving the socio-economic status, which has a beneficial effect on the

government different social groups, such child support grants (CSG). Therefore, there is

Demographic Surveillance Site is one of the poorest areas in South Africa and benefit from

employment opportunities in order to reduce poverty. The African child health and

reduce poverty needs to be prioritized by empowering health communities and creating

less than one year and those aged from one to four years old. Therefore, poverty

This major cause of death is followed by tuberculosis and diarrhea between both infectious

anti-retroviral therapy in order to reduce the mother to child transmission (ART).

Therefore, public health interventions program have to be restructured such that our

HIV/AIDS remains a major cause of death in South Africa and Sub-Saharan Africa.
Childhood Mortality and SES in the Abacautsi HIDS in 2003, South Africa

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Childhood Mortality and SES in the Apartheid Ross in 2003, South Africa

...
<table>
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<th>Component</th>
<th>Component</th>
<th>Cumulative</th>
<th>Differente</th>
<th>Proportion</th>
<th>Proportion</th>
<th>Difference</th>
<th>Proportion</th>
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<td>0000</td>
<td>0000</td>
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<td>0000</td>
</tr>
</tbody>
</table>

Appendix 2: Table 3.4.1: Cumulative, proportion and difference of principal components (sections) in A&B.
### Table 1

| Age Group | Male (%) | Female (%) | Total (%)
|-----------|---------|------------|----------
| 0-1 month | 15.6    | 16.1       | 15.8     |
| 1-4 months| 15.8    | 15.8       | 15.8     |
| 5-14 months| 15.6  | 15.9       | 15.8     |
| 15-23 months| 15.6 | 16.0       | 15.8     |
| 24-35 months| 15.7 | 16.0       | 15.9     |
| 36-47 months| 15.6 | 16.0       | 15.8     |
| 48-59 months| 15.5 | 16.0       | 15.8     |
| 60+ months | 15.6   | 16.1       | 15.8     |

### Footnote

Houshold in eXhuent wit children less than 5 years in 2003, South Africa.

### Building Materials

Building materials used for construction of houses according to wealth index status for

Appendix 2:
## Appendices: Structure of Main Dwelling according to Wealth Index Status for Households in Africa who lost child(ren) less than 5 years in 2003, South Africa

<table>
<thead>
<tr>
<th>Wealth Index Category</th>
<th>Category I</th>
<th>Category II</th>
<th>Total</th>
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<tr>
<td>Highest</td>
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<td>1009</td>
<td>2010</td>
</tr>
<tr>
<td>Medium</td>
<td>1002</td>
<td>1008</td>
<td>1010</td>
</tr>
<tr>
<td>Low</td>
<td>1003</td>
<td>1005</td>
<td>2008</td>
</tr>
</tbody>
</table>

*Note: The table above shows the distribution of households in Africa who lost child(ren) less than 5 years in 2003, sorted by wealth index categories.*
### Appendix 5

#### A.6: Child mortality and disability in the 5 year-old households in 2003, South Africa

<table>
<thead>
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<th>Year</th>
<th>Area</th>
<th>Child Mortality</th>
<th>Disability</th>
</tr>
</thead>
<tbody>
<tr>
<td>2003</td>
<td>All</td>
<td>2.3%</td>
<td>3.1%</td>
</tr>
<tr>
<td>2004</td>
<td>All</td>
<td>2.5%</td>
<td>3.2%</td>
</tr>
<tr>
<td>2005</td>
<td>All</td>
<td>2.7%</td>
<td>3.3%</td>
</tr>
<tr>
<td>2006</td>
<td>All</td>
<td>2.9%</td>
<td>3.4%</td>
</tr>
</tbody>
</table>

Note: All data is based on the 2003 household survey conducted in South Africa. The data includes both child mortality and disability rates for the 5 year-old age group.
Housesholds in Accordance with children less than 5 years in 2003, South Africa

Appendix G

Incomes of households and transport facilities according to wealth index status for

(N=2787)
<table>
<thead>
<tr>
<th>Rank</th>
<th>Children 0-5 not enrolled in school</th>
<th>Children 0-5 enrolled in school</th>
<th>Children 0-5 with no education</th>
<th>Children 0-5 with some education</th>
<th>Children 0-5 with primary education</th>
<th>Children 0-5 with secondary education</th>
<th>Children 0-5 with tertiary education</th>
<th>Total Children 0-5</th>
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</thead>
<tbody>
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<td>1-2</td>
<td>2-3</td>
<td>3-4</td>
<td>4-5</td>
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<td>2-3</td>
<td>3-4</td>
<td>4-5</td>
<td>5-6</td>
<td>6-7</td>
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<td>10-11</td>
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### Appendix I

Comparison of household socioeconomic status for households in Africa with

---

*Children less than 5 years in 2003, South Africa*