The Ellisras Longitudinal Study experience in combating noncommunicable diseases in rural areas of Lephalale

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South African National Research Council and Medical Research Council, V Research Council, Vu Medical Centre, Amsterdam, The Netherland, for supporting the study overtime

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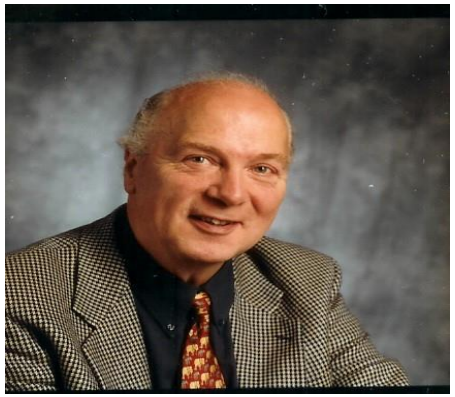
Aim of the Presentation

- How Ellisras Longitudinal Study was used in combating noncommunicable diseases in rural areas of Ellisras/Lephalale

Prof HJ Siweya
Executive Dean
Faculty of Science and Agriculture, UL



Prof Han Kemper and Prof Jos WR Twisk
Amsterdam Longitudinal Growth and Health Study

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Historical Background ELS

- Witchcraft was center of debate due to unknown cause of death in the Ellisras rural communities in the late 1980s and before the release of Dr Nelson Mandela

- Five women including a pregnant women who was my next door neighbor were burnt to death in Mmaletswai village (where I originated), Lephalale/Ellisras in one night as they were labeled as witches following unknown cause of death of a local women

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RESEARCH QUESTIONS FOR ELS

1. How do rural South African boys and girls grow and develop with respect to their physical and psycho-social well-being from age 3 to 40 years?

2. How healthy are these children and how healthy is their lifestyle with respect to diet, physical activity, smoking behaviour and alcohol consumption?

3. What is the development over time of biological and behavioural risk factors for CVD and/or diabetes in children from rural South Africa?

4. What are the relationships over time between lifestyle changes and health outcomes in this longitudinal measured rural children in South Africa?

5. What are the changes that occur over time in serum levels of a variety of biochemical parameters relat to CVD s diabetes.

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1996

2023

ELS subjects are born between 1986 to 1994.

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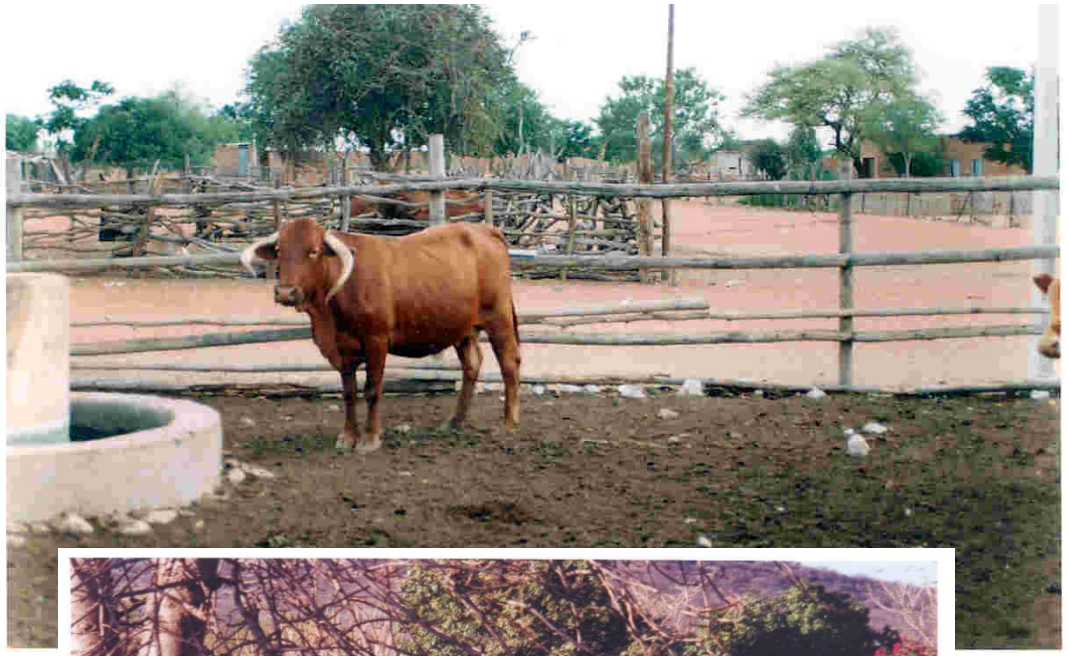
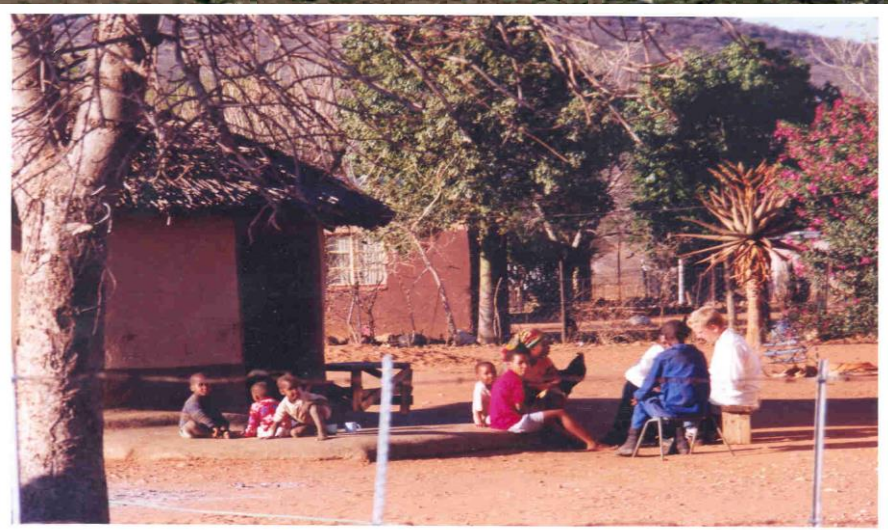
Methodology





- **Geographical Area**
- Ellisras situated within the north-western area of the Limpopo Province, South Africa.
- The population is about 50 000 people residing in 42 settlements.
- These villages are approximately 70 km from the Ellisras town (23° 40S 27° 44W), now known as Lephalale, adjacent to the Botswana border.
- The Iscor coal mine and Matimba electricity power station are the major sources of employment.
- Other workforce is involved in subsistence farming and cattle rearing, while a minority is in education and civil service.
- Unemployment, poverty and low life expectancy played a significant role in the rural South African popu[illegible]

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Sample

A total of 2225 (550 preschool children mean age 4.4 years SD= 0.99 and 1675 primary school children mean age 8.0 years SD=1.11) at baseline were followed throughout the periodic surveys.

November 1996, May 1997, November 1997, May 1998, November 1998, May 1999, November 1999, May 2000, November 2000, May 2001, May 2002, May 2003, November 2003, Dec 2008/ 2009, Dec 2014/15,

2018, 2021, 2022. 2023

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Methodology

- In May 1999, medical students from VU Medical Centre, Amsterdam, The Netherlands included the blood pressure (BP) parameter and other health variables to the ongoing ELS.
- A total number of 2021 children participated.

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Attrition rate

- On average 1.05% of participants were permanently loss due to them passing away and 11.47 % subjects lost due to teenage pregnancy, illness, migration to urban areas, school dropout were temporary as they rejoined the study thereafter at a younger age from November 1996 to November 2003

- From 2005 to 2023 the attrition rate ranges from 2.4 to 70.3% due to migration to urban and farm areas, illness, pregnancy, marriages and death. These participants re-joined the measurements session when they were available in the area. However, the attrition rate based on permanent loss due to death ranged between 0.71 and 3.73% for boys and 0.75 and 4.89% for girls (Monyeki et al., 2019).

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METHODOLOGY

"1996-2023, Dec 2008/ 2009, Dec 2014/15, Dec, Dec 2018, Dec 2021. Dec 2022 and Dec 2023"

- **Anthropometry**
- International society for the Advancement of Kinanthropometry protocol was used (Norton and Olds, 1996).

- Children were measured twice each year from Nov 1996 to Nov 2003 the oth
years

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Blood pressure

"1999-2023, 1996-2023, Dec 2008/ 2009, Dec 2014/15, Dec 2018, Dec 2021, Dec 2022 and Dec 2023""

- Using an Omron electronic Micronta monitoring kit, following the guidelines by A working group report from the National High Blood Pressure Education Program (1996).

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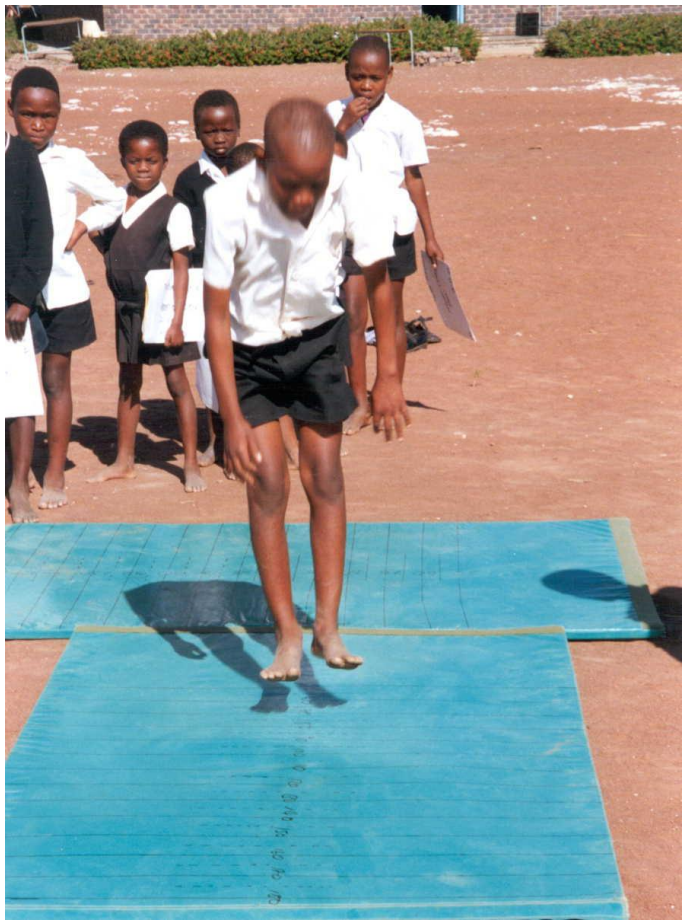
Physical fitness

2000, 2001, 2002 and 2003"



- EUROFIT (1988) and American Alliance for Health, Physical Education, Recreation and Dance, (1980) were used.
- Children were tested once a year

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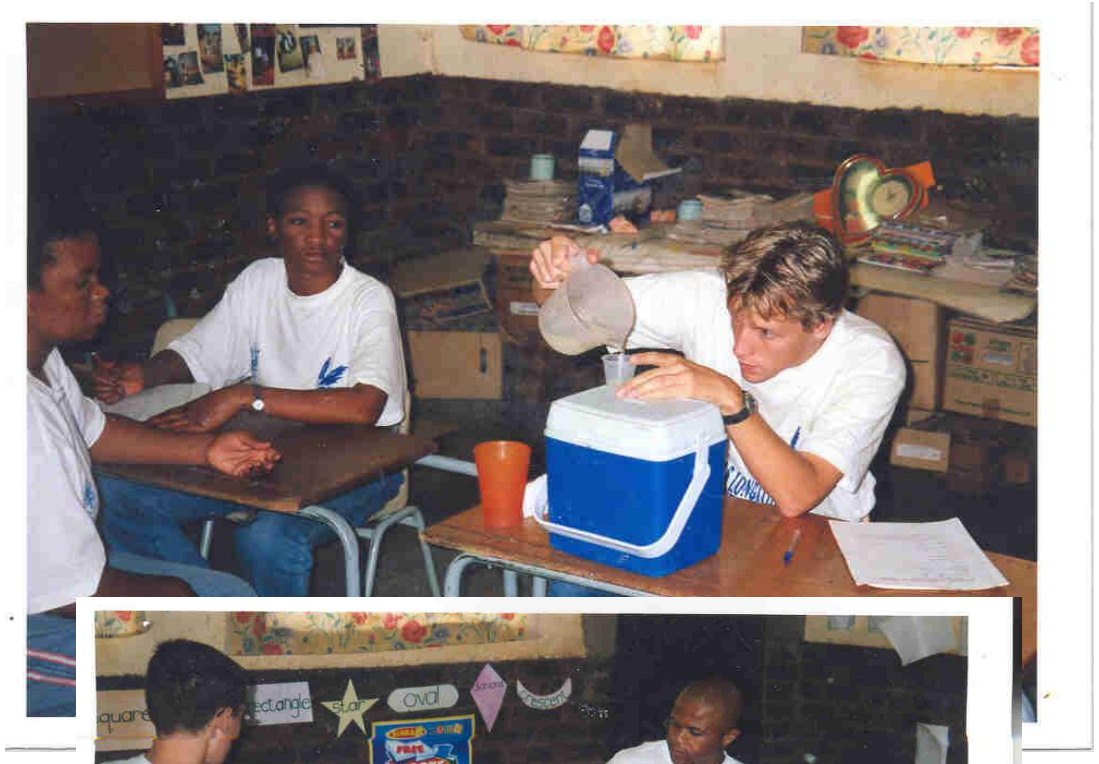
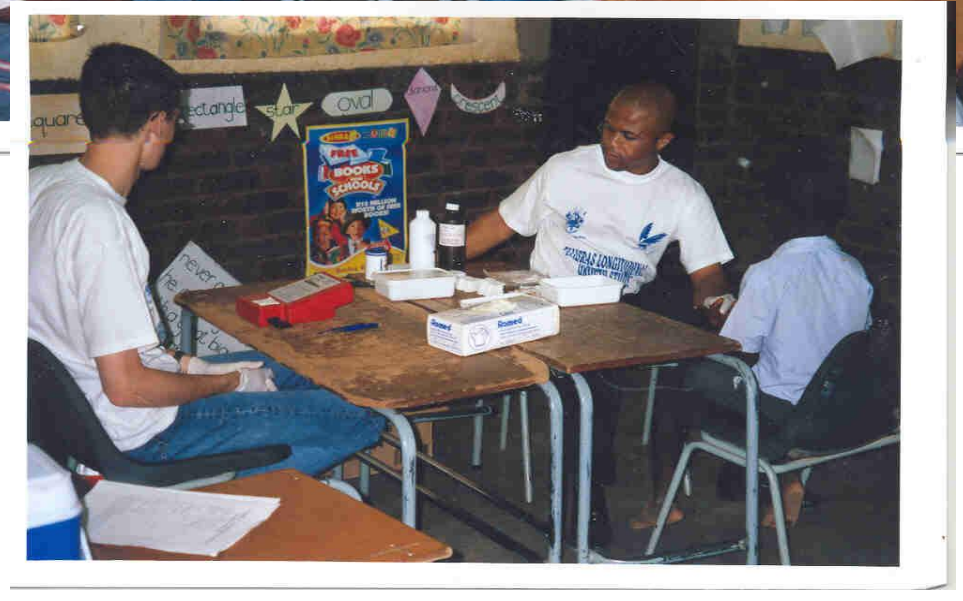
Educational achievement's test

"2001 and 2002"

- All children were tested in English and Mathematics tests designed by the **South African Human Research Council (1995).**

Glucose tolerance test





"2001"

- Diabetes was diagnosed with an Oral Glucose Tolerance Test.
- Hemocue® was used.
- The test by administer by Vrije Medical University students with the assistant [illegible] local hospital

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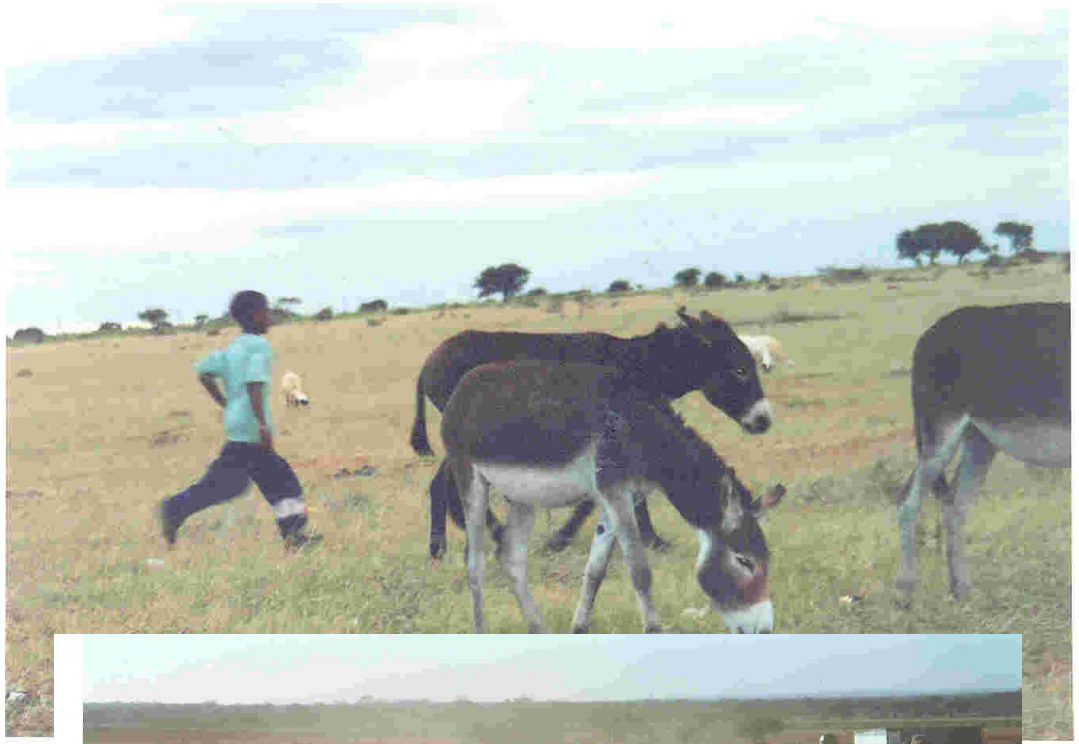
Habitual Physical activity



1999, 2001 and 2014

- It was assessed using questionnaire adopted (Habitual physical activity) from Prista et al. (2000).

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Dietary intake

1999, 2000, 2015, 2018, 2021 and 2022

- A 24-hour recall questionnaire was administered by final year students of Human Nutrition department of the University of the North.
- Interviews were done at the home of each child.
- Later they were interviewed directly as adults

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- Socio Economic Status
- 1999, 2013 and 2022

- Physical activity questionnaire
- 2013 and 2022

- Smoking study
- 2005, 2009, 2013 and 2022 and 2023

- Alcohol consumption
  “2013 and 2022 and 2023

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Fasting Blood sample- lipids, Plasma and glucose

A total of 700 to 800 ELS participated

2015, 2018, 2021 and 2023

- Quality control
- 16 fieldworkers were trained each year before each survey (Monyeki et al 2002)

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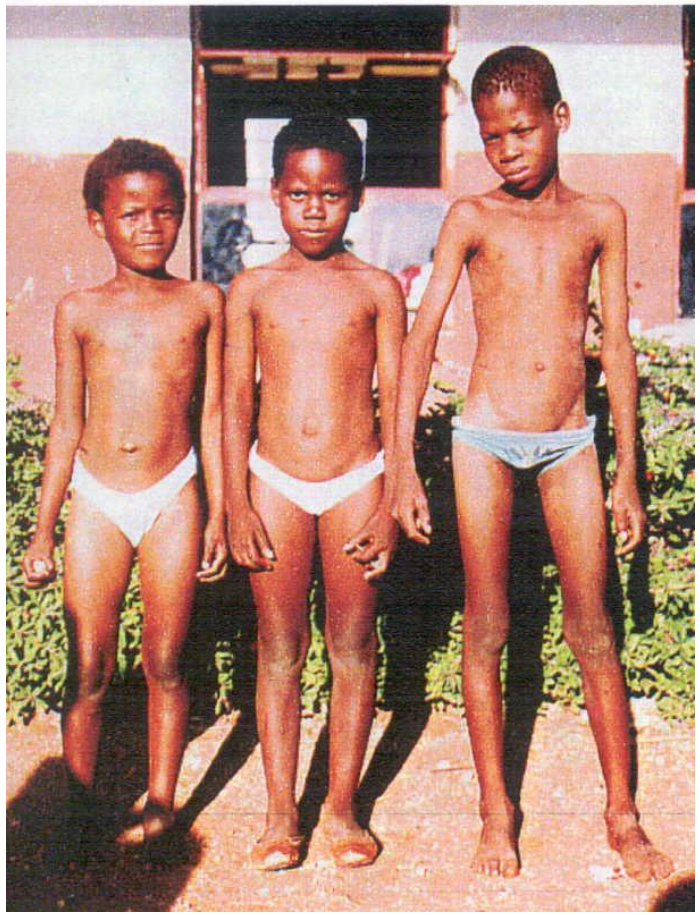
Conclusions “Descriptive”



- The prevalence of overweight was low (ranged from 2.3 to 4.3%) age 3 to 10 years (Monyeki, et al, 2000).

doi:10.1002/(SICI)1520-6300(200001/02)12:1<42::AID AJHB6>3.0.CO;2-0

- The prevalence of hypertension was low (ranged from 1 to 5.8% boys, 3.1 to 11.4% for girls) aged 3 to 10 years (Monyeki et al., 2006, doi: 10.1093/ije/28.2.287)

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Conclusion “Descriptive”

- Higher prevalence of obesity and overweight were observed among females (overweight being 23.45%; obesity of 25.8%) while low prevalence for boys (overweight 9.4 %, obesity 4,3%) between the age of 21 to 30 years (Mashiane et al., 2018)

doi: 10.5830/CVJA-2018-033. Epub 2018 Oct 24. PMID: 30371723

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Conclusion “ Descriptive”

- Hypertension prevalence was 22.2 for boys and 4.6% for girls aged 21 to 30 years (Sekgala et al., 2018)

(doi: 10.1038/s41371-018-0076-8).

- The prevalence of alcohol consumption was found to be 33.3% (38.6% in males and 28.0% in females aged 21 to 30 years

(Matshipi et al., 2019)

doi: 10.3390/ijerph16152650

CONCLUSION
"Descriptive"

- Low physical activity patterns among girls compared to boys. (Monyeki et al., 2005).

doi: 10.1038/sj.ejcn.1602153

- The prevalence of tobacco product use increases with increasing (4.9 to 17.1%) age among boys whereas girls do not smoke cigarette but only considerable number (1.0 to 4.1%) use home made tobacco products (Mashita et al., 201
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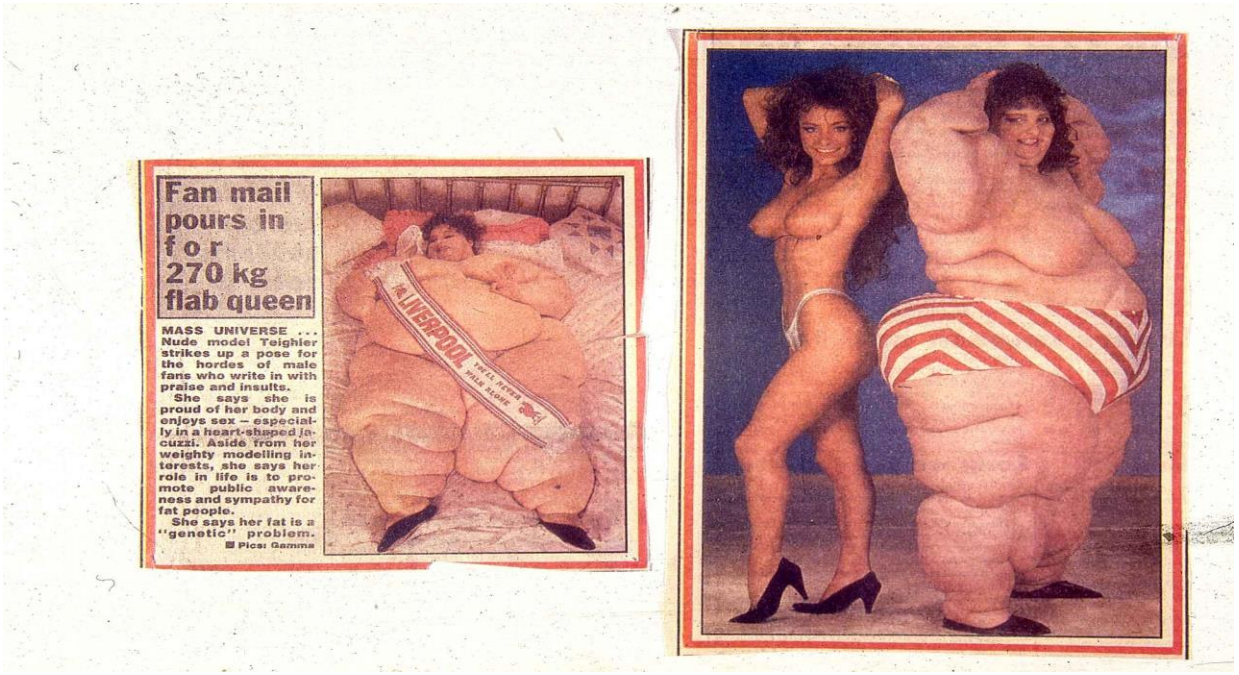
CONCLUSIONS
"Trends"



- A significant tracking of BMI exists in the ELS children
- The development of obesity and overweight was more prevalent among girls compared to boys (Monyeki et al, 2008)

doi: 10.3329/jhpn.v26i4.1882.

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COMMUNITY DEVELOPMENT

- 1). **Birth certificate-** The ELS followed a cluster sampling method. Only those with valid birth certificate were potential participant. Because every child wanted to be part of the study the parents made effort to obtain the birth certificate of their children through the department of home affairs.

- 2). **Cleanliness of children-** in 1996, when the project started it was difficult for the field workers to work with the children, as they were not clean. I then initiated an ELS calendar such that the school that had all its children clean during our fieldwork will appear in the calendar the following year. Each principal wanted his/her school to appear on our ELS calendar hence children in the school were encouraged to be clean. The value that was carried over even during holidays.

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COMMUNITY DEVELOPMENT

- **Vegetable garden-** It was during our report back seminar that we emphasize healthy nutrition to each child.
- We encourage the schools to have vegetables garden.
- Community members also made vegetable garden in their own homes despite the shortage of water in the community.

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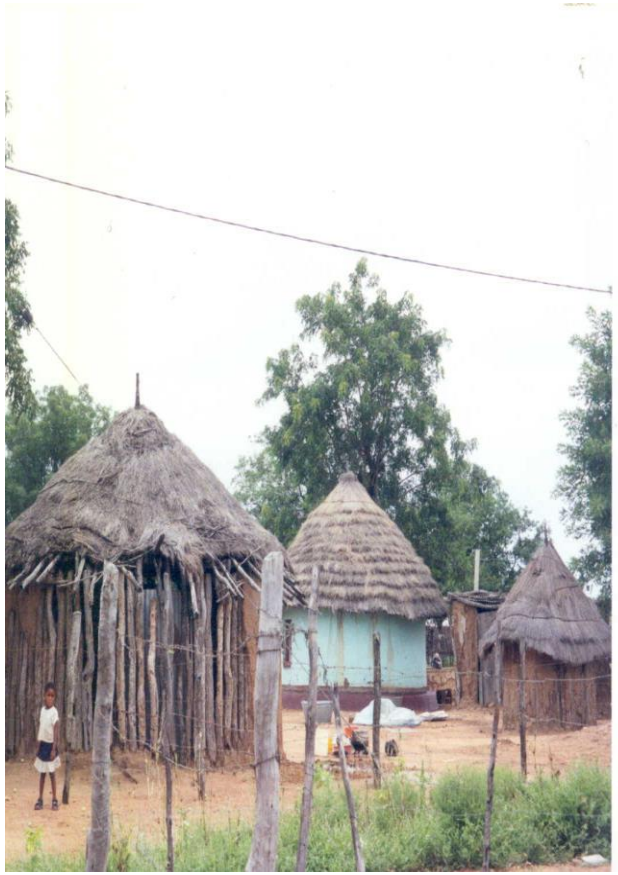
COMMUNITY DEVELOPMENT



- **Clinic Attendance-** Parents did not often took their children to local clinic when they were ill. The general beliefs were in the traditional medicine. Through the report back seminar we encouraged the community members to reduce unnecessary death by taking their children to medical clinics and consults with health professionals regularly as the service is rendered for free today.

- **Community health workers** – The student numbers at the University of Limpopo deteriorated drastically in 2000 as black students were then allowed to enrolled to White Universities in the country. That had an effect on the number of students to be recruited for fieldwork. It was against this background that community health workers were recruited. They were trained together with the students for data collection and later become our mouthpiece to the community on health related matters.

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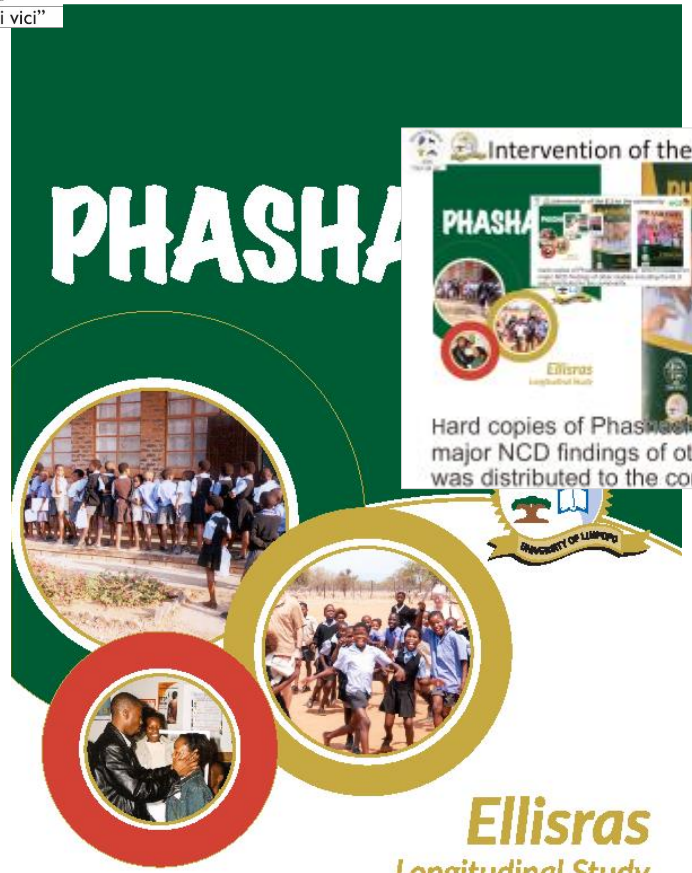
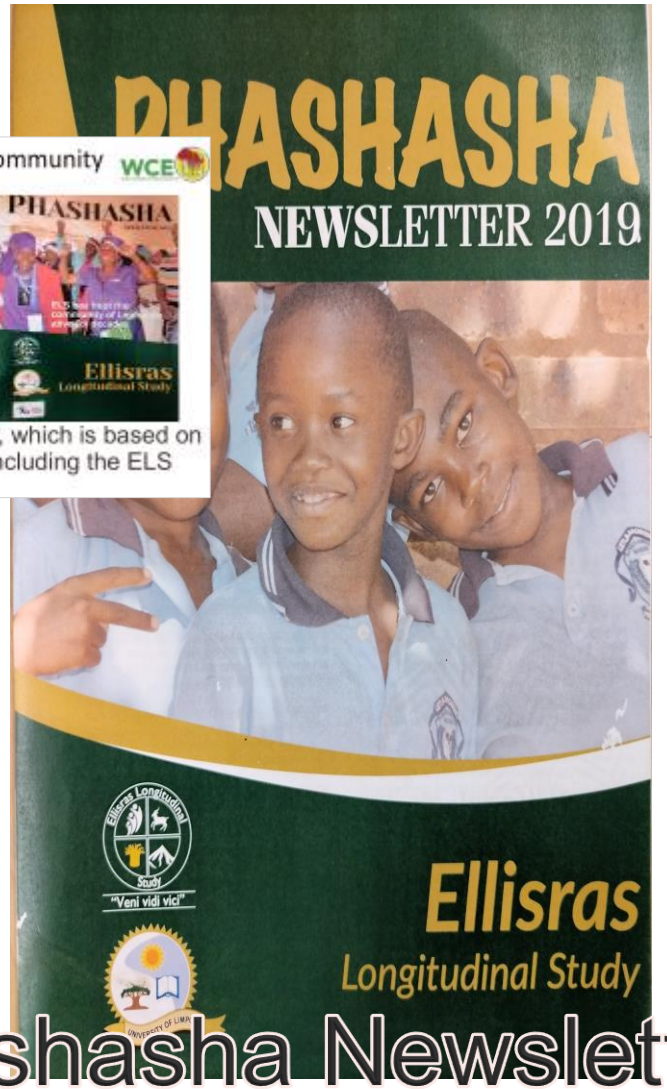
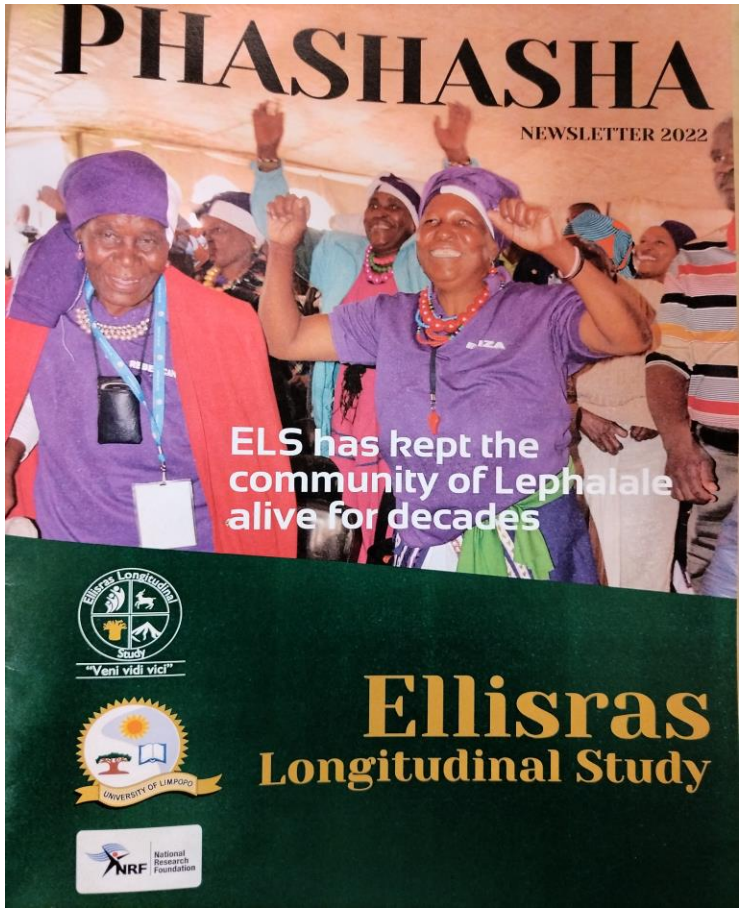
Intervention of the ELS to the community







Hard copies of Phashasha Newsletter, which is based on major NCD findings of other studies including the ELS was distributed to the community.

Community development

1st, 2nd, 3rd ELS and other none communicable diseases International conference

University of Limpopo and Lephalale 2017, 2019, 2022

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Conclusion

Prof Andre Kengen, Medical Research Council, Cape Town

- The 1st 2nd and 3rd ELS conference provided a unique inclusive platform for discussion by ordinary members of the Ellisras community, expert scholars, students and experienced professionals

- The community become aware of dangers poses by non-communicable diseases in their daily life

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Prof Han Kemper (The Netherlands) addressing the Ellisras community regarding healthy lifestyle choice

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Community initiated soccer team of the elderly

Finally

- The community no longer speaks of witchcraft at random like in the past
- Changing lifestyle becomes an individual choice

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- Further research is needed in this Ellisras community to further uproot the dangers pose by none communicable diseases

- The community is available.
- ELS needs Funding and collaboration going forward

Thank you for your time

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