HLABISA DEMOGRAPHIC SURVEILLANCE SYSTEM
SOUTH AFRICA

AFRICA CENTRE FOR POPULATION STUDIES AND REPRODUCTIVE HEALTH
(ACPSRH)
UNIVERSITY OF NATAL
UNIVERSITY OF DURBAN
AND
SOUTH AFRICAN MEDICAL RESEARCH COUNCIL (MRC)

3 Map Panel will be added here

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1. HLABISA DSS SITE DESCRIPTION

1.1 Physical Geography of the Hlabisa DSS Area

Hlabisa health district is located in northern KwaZulu-Natal, South Africa and covers an area of 1,430 km$^2$. Altitude ranges from 20-300 m above mean sea level. The terrain is flat to undulating to mountainous and vegetation ranges from sparse grassland to thick forest. Add Latitude and Longitude range in decimal degrees.

1.2 Population Characteristics of the Hlabisa DSS Area

The Hlabisa district is one of many official rural magisterial districts in KwaZulu-Natal. Prior to the political transition in 1994, this district formed part of the KwaZulu homeland and was co-terminous with the Hlabisa health ward, an integrated and semi-autonomous unit of the homeland health system. It was built around a community or non-specialist hospital, from which comprehensive primary health care services were administered and supervised through a radiating network of fixed and mobile clinics. Following the political transition, the KwaZulu homeland has been dismantled and all services re-organised into a 3-tiered national health system with national, provincial and district level responsibilities. Although the districts are in a state of transition, the Hlabisa health sub-district is largely co-terminous with the previous Hlabisa health ward and still functions as a semi-autonomous and integrated health system at the district level. This site, therefore, constitutes a functional unit of the national health system, and provides a representative district health system model for the implementation of national health policies and programmes.
The resident population of 210,000 people is Zulu-speaking and predominantly rural, although there are pockets of urban and peri-urban populations in the south-eastern part of the district near the market town of Mtubatuba. It is made up of 4 tribal areas each under the local authority of a tribal chief or *inkosi*. Although residents of the tribal area owe allegiance to and fall under the local jurisdiction of the chief they are not necessarily members of his traditional clan or tribe. No data are yet available on religion but the majority are considered to be Christian.

Unlike the situation in many other parts of Africa, where homesteads are clustered in clearly identifiable villages, rural populations in KwaZulu-Natal live in scattered multi-generational homesteads of varying size (1-100 people). The area is characterised by large variations in population density (0-6500 people per km$^2$). There is substantial circulatory migration between the district and commercial and industrial centres, at varying distances from the Hlabisa district, and, to a lesser extent, between the district and remote rural areas in the hinterland. This is largely driven by the need for access to employment and educational opportunities. There are also wide differentials in living standards, literacy rates and access to electricity and clean water though, overall, social and environmental conditions are substantially better than in many other countries in sub-Saharan Africa. Annual per capita income is US$1,730, the literacy rate 69%, and life expectancy averaged 63 years at the beginning of the AIDS epidemic. There is substantial demographic and epidemiological variability in South African populations reflecting regional and ethnic differences and, in the final analysis, vast differentials in social and economic conditions.

The health infrastructure in the Hlabisa district is typical of many other rural health districts in KwaZulu-Natal and, to a lesser extent of districts elsewhere in South Africa. The central fixed health facility in the district is a community or non-specialist hospital run by generalist medical practitioners and nurses. It provides a wide range of curative and emergency services, including surgical and obstetrical care, as well as the usual range of primary health care services, offered at fixed clinics.
Scattered throughout the district are 12 fixed nurse-run clinics, providing routine prenatal, natal and postnatal care, family planning, preventive child health services (including immunisations), treatment for TB, STDs and non-communicable diseases, such as diabetes and hypertension, and treatment of a wide range of minor complaints. All conditions considered to exceed the capacity or skill of the resident nurses are referred to the hospital. These clinics are supervised from the hospital and are visited 2 weekly by a medical doctor from the hospital.

In those parts of the district not covered by fixed clinics, mobile health services are provided at defined visiting points on a 2-4 weekly basis. The level and range of services offered are similar to those offered at the fixed clinics though they are unable to offer deliveries or any other forms of treatment or care that require short-term stay or admission. Community health workers cover approximately half of the homesteads in the district and are largely responsible for nutritional and general health promotion in these households, supervised home care and, where necessary, for referral to clinic or hospital.

Clinics are generally well utilised with approximately 95% of pregnant women attending antenatal clinic at least once during their pregnancies and up to 80% of children achieving full primary vaccination, i.e. up to and including measles vaccination. Substantial use is also made of the medical services offered by private practitioners in Mtubatuba and at private clinics further afield in the towns of Empangeni and Richard’s Bay.

2. **HLABISA DSS PROCEDURES**

2.1 **Introduction to the Hlabisa DSS Site**
In 1991 the MRC established a research station at Hlabisa hospital as a rural research unit of the national Centre for Epidemiological Research in South Africa (CERSA). The presence of this productive MRC unit was probably the most important factor responsible for the selection of the Hlabisa district as the site for the Africa Centre for Population Studies and Reproductive Health. The Africa Centre was established in April 1997 and moved into the Hlabisa district in November 1997. During the past 3 years residential and office infrastructure has been established, the entire health district has been mapped and the demographic surveillance system has been set up in the south-eastern section of the district. Other projects have also been set up during this period, including studies to determine the effect of exclusive breast feeding on mother-to-child transmission (MTCT) of HIV and another to determine the effect of male labour migration on HIV infection in non-migrant partners.

The demographic surveillance area (DSA) is based in the tribal area of Mpukunyoni, the most populous and least mountainous part of the Hlabisa district, and includes the township of Kwamsane. It is approximately 435 Km$^2$ in size and is sharply demarcated by hard boundaries in the form of large perennial rivers, nature reserves, forestry areas and commercial farmland on all but its northern boundary. As a result, the DSA is a relatively discrete and well-circumscribed geographical unit, thus allowing clear definition of the surveillance population. Although we do not yet have the data to show it, we fully expect the surveillance population to be representative of rural populations in KwaZulu-Natal and, to a lesser extent, of rural black populations elsewhere in the country.

The objectives of the Hlabisa DSS are:

1. To describe the demographic, social and health impact of a rapidly spreading HIV epidemic in a population going through the health transition.
2. To assess the ameliorating effect of different intervention strategies on the march of the epidemic.
3. To measure the burden of disease including that of HIV/AIDS in this population.

4. To describe patterns and determinants of health service utilisation and their impact on demographic and health outcomes.

5. To provide infra-structural and methodological support for a number of related reproductive health research projects within the same population, including:

- Sampling frames at household and individual level
- Explanatory and confounding variables for distal outcomes
- Linkage of health facility and household data sets
- Linkage of data sets from different projects
- Project management and logistical planning within a population setting.

The total population of the Hlabisa district was estimated at 210,000 in the last census (1996). The surveillance population is expected to include 70,000 residents and an additional 20,000 non-residents who are still considered to be part of households in the DSA. This number falls within the recommended range for demographic surveillance systems and is a sufficient sample size to generate most key demographic rates besides maternal mortality. We cater for non-resident members in the surveillance system since there are large numbers of migrants who regularly return home, contribute significantly to the financial resources of households and who, since they often return home to give birth or to die, will contribute to both mortality and fertility estimates.

Actual DSS surveillance in Hlabisa only began in the year 2000 and at the time of this monograph the first annual data set is not yet complete.

The Hlabisa DSS site is managed by the Africa Centre for Population Studies and Reproductive Health is an international research centre based in the Hlabisa health district on the eastern seaboard
of KwaZulu-Natal, midway between the city of Durban and the Mozambique border. This centre was established in 1997 as a consortium between two universities – the University of Natal and the University of Durban-Westville – and the South African Medical Research Council (MRC) and funded through a generous 5-year grant from the Wellcome Trust in the United Kingdom.

The Africa Centre Demographic Information System (ACDIS) is a foundation project within the Africa Centre. It is an advanced demographic surveillance system that provides the main vehicle for a multi-disciplinary population studies research programme and a platform for a number of other related reproductive health research projects within the same geographical area. ACDIS covers a resident population of approximately 70,000 people and a total population of 90,000 that includes non-resident household members (e.g. migrant workers).

Add a note on expected consumers of the Hlabisa DSS products….

2.2 Hlabisa DSS Data Collection and Processing

2.2.1 Field Procedures

a) Mapping
The entire health district has been mapped.

You have the strongest GIS capacity of any INDEPTH site. It would be good to amplify this paragraph a bit.

b) Initial Census

ACDIS has only recently been established and commenced its first round of visits to all homesteads in the DSA in February 2000. The entire population within the circumscribed demographic surveillance area constitutes the study sample. In the first round a complete census of all homesteads (places of residence), households (social groups) and individuals has been conducted. Baseline data collection has included descriptive characteristics of homesteads and households, demographic attributes of all individuals and detailed pregnancy and reproductive histories from all women of reproductive age.

c) Regular Update Rounds

Continuous registration and updates of all new and existing homesteads, households and individuals occurs during each round of data collection. All homesteads in the DSA are visited on a 4 monthly basis to register all new individuals and households, to update demographic variables on registered individuals and households, and to record all births, deaths and migrations. Reproductive health questionnaires are completed on all women of reproductive age (15-49 years). In subsequent ‘update' rounds all demographic events and changes in the status of all homesteads, households and individuals in the surveillance area are recorded. Additional modules dealing with subjects such as household socio-economic status, health-related conditions, HIV sero-prevalence or disability may be
added on to routine updates as the need arises. Surveillance will continue for a minimum of 5 years, but will almost certainly be extended beyond this period if the research programme is productive.

Baseline surveys on all women of reproductive age are conducted throughout the duration of the project. Household socio-economic questionnaires are expected to be conducted annually in all homesteads in the DSA. Other surveys such as HIV sero-prevalence surveys, disability surveys etc are likely to be conducted in the future as the need arises. At present no biological samples or direct measurements are taken from DSS subjects.

d) Continuous Surveillance

Births and deaths are recorded and regularly updated as above. Deaths are reported as part of the regular notification of vital events. Every death notification triggers a separate visit by a verbal autopsy nurse who administers a standard 3 part verbal autopsy questionnaire to determine the likely cause of death.

e) Supervision and Quality Assurance

All questionnaires are checked by supervisors when they come out of the field and serial sub-samples further checked by managers at different levels. Supervisors make weekly quality control visits to at least 5% of homesteads visited by fieldworkers in the preceding period during each round to validate interview findings. During the first 2-4 weeks of each round supervisors accompany each of their fieldworkers on weekly supervised visits in which there is an opportunity to support and correct interviewing technique difficulties and misconceptions as early as possible. Additional unannounced spot checks are made in the case of weak or unreliable fieldworkers.
2.2.2 Data Management and Analysis

a) Data Handling and Processing

Data are collected at homestead and household level from a hierarchy of key informants with highest priority given to those key informants with the greatest knowledge about other household members. Individual data is collected preferentially from the individual concerned but in his or her absence from the best-informed key informant. In the case of reproductive health questionnaires all information is collected directly from the woman herself. All questionnaires are entered into a large relational ACCESS database using a customised front-end (programmed in DELPHI 5) specifically developed for ACDIS.

b) Data Quality Assurance and Links to the Field

Data are single punched by two shifts of six data capturers each, and subjected through the data entry programme to a series of validity and consistency checks. All questionnaires with evident errors or omissions are returned to the field for correction and those that are free of errors are archived after data capture. All errors that cannot be corrected by supervisors are returned to fieldworkers for revisits and corrections.

c) Data Analysis and Dissemination

Please add a few sentences here, particularly regarding dissemination plans...
3. HLABISA DSS BASIC OUTPUTS

3.1 Demographic Indicators Generated by the Hlabisa DSS Site

Actual DSS surveillance began in the year 2000 and at the time of this monograph the first annual data set is not yet complete. Hence no indicators can be provided for the moment.

However, can you give at least the sex and age structure of the population at this point? This can be written in narrative form for the broad age classes. We can also turn 5 year age groups by sex into a standard population pyramid so you have at least one graphic in your chapter.

Figure 1. Population pyramid for the Hlabisa DSS Site
4. REFERENCES

Any references or citations useful in setting up the site?
5. ACKNOWLEDGEMENTS

The Africa Centre was established through a large core grant from the Wellcome Trust in the United Kingdom for a minimum period of 5 years. Since then additional funding has been obtained from the National Institutes of Health (NIH) in the USA. Additional funders, such as Centre for International Migration (CIM), a German governmental aid organisation supporting human capacity development in developing countries, have made important contributions to the funding of expatriate scientists.

Do you want to thank your donors here?

Do you want to thank anyone who helped set up the site who are not part of the team?

Do you want to thank any or all team members?
### SUMMARY MATRIX – HLABISA DSS CORE DETAILS AT A GLANCE

<table>
<thead>
<tr>
<th>Feature</th>
<th>Hlabisa DSS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location of DSS Site</td>
<td>South Africa</td>
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<tr>
<td>Surveillance Population Size</td>
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</tr>
<tr>
<td>Ecological Zone</td>
<td>Temperate</td>
</tr>
<tr>
<td>Urban, Peri-urban or Rural</td>
<td>Rural</td>
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<tr>
<td>Purpose of DSS</td>
<td>HIV &amp; reproductive health research</td>
</tr>
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<td>Operating since</td>
<td>2000</td>
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<td>Update Round Frequency</td>
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<tr>
<td>Verbal Autopsy</td>
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<tr>
<td>GIS</td>
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<td>Socio-economic status data</td>
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<tr>
<td>Software System</td>
<td>Custom DELPHI 5/Access Database</td>
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<td>Migration Tracking</td>
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<td>Dependency Ratio</td>
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<td>Total Fertility Rate</td>
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<td>Age Standardized Mortality</td>
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<td>Infant Mortality Rate</td>
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<td>Under five Mortality Rate</td>
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<tr>
<td>Sex Ratio</td>
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</tbody>
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This information will be re-coded and compiled into a single matrix of all DSS Sites.

Please confirm