1998 SOUTH AFRICA DEMOGRAPHIC AND HEALTH SURVEY REPORT FOR EASTERN CAPE PROVINCE

SUMMARY REPORT WITH RESULTS FROM IMPACT EVALUATION

MEASURE *Evaluation*
University of North Carolina at Chapel Hill
Tulane University, New Orleans

EQUITY Project
Management Sciences for Health
Eastern Cape Department of Health
Eastern Cape Province, South Africa

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Measure Evaluation

The **EQUITY** Project
...strengthening equitable access to quality health services for all South Africans...

Contributors to the Report

Paul Hutchinson, Tulane University
J. Ties Boerma, University of North Carolina at Chapel Hill
Maria Khan, University of North Carolina at Chapel Hill

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Executive Summary

The purpose of this report is to present results from further analysis of the South Africa Demographic Health Survey 1998 in the Eastern Cape Province and from an impact evaluation of government health services on the health of the Eastern Cape population. The information and findings presented in these pages represent a summary of a more extensive report prepared by MEASURE *Evaluation* and the Equity Project, Eastern Cape Department of Health.[1] The information in these reports contains material and analyses not present in other reports, including the following:

1) Socio-economic Status Analyses: Analyses of health behaviors and health outcomes – including early childhood mortality – by socioeconomic status using wealth indicators calculated from household ownership of common assets and consumer durables;
2) Regional Analyses: Analyses by district council and urban/former Transkei/rural non-Transkei;
3) Adult Health Analyses: Logistic regression indicating factors placing adults at greater risk of hypertension and obesity and children at greater risk of premature mortality;
4) Survival Analyses: Survival analysis of factors associated with age at first sex, age at first birth, and breastfeeding duration;
5) Impact Evaluation: Multilevel analysis (MLA) evaluating the impacts of government health services on the prevalence of modern contraception, unmet need for family planning, childhood immunizations, adult curative care, knowledge and awareness of HIV/AIDS, and delivery care.

Some of the main findings of this report include the following:

1) Poverty: Close to 60 percent of households in Alfred Nzo and 40 percent of households in Oliver Tambo can be categorized as being in the poorest socioeconomic quartile, or poorest 25 percent of the population. Sixty-one percent of households in Mandela district council were in the wealthiest socioeconomic quartile, or richest 25 percent of the population.
2) Orphanhood: Approximately 11 percent of children were orphans, and over 40 percent of children did not live with any parent.
3) HIV/AIDS: HIV/AIDS knowledge was nearly universal, but use of condoms during last sex was low – only 8 percent of sexually active women.
4) Sexual Behavior: The mean age at first sex declined – i.e. women were experiencing sexual debut at younger ages – by one full year during the period 1988-1998.
5) Child Mortality: For the province as a whole, the neonatal, infant, and under-five mortality rates were 25, 61 and 80 deaths per 1,000 live births respectively. These rates were nearly three times higher in the former Transkei.

[1] *1998 South Africa Demographic and Health Survey Report for Eastern Cape Province.* Bisho, South Africa: MEASURE *Evaluation* and EQUITY Project; 2003.

6) Maternal and Child Health: Nearly all women used antenatal care, but a high proportion of women in the former Transkei (37 percent) and other rural areas (26 percent) delivered at home. A rise in the mean birthweight was noted during the period 1993-1998. Even so, 17 percent of children born to women in the poorest quartile were considered to be underweight. This compares with only 1 percent of births to women in the richest quartile. Twelve percent of births in rural areas were considered to be underweight, as compared with only 2 percent of births in urban areas.
7) Adult Health: Nearly half of the Eastern Cape adult sample were categorized as overweight (24.2 percent) or obese (21.1 percent). This corresponded with measured hypertension rates of nearly one-fifth of the adult sample.
8) Impact Evaluation: In rural areas, higher quality of services at government clinics – as measured by indices of staff training, drug and supplies availability, and a higher proportion of filled staff posts – increased the likelihood that a variety of health services (modern contraception, condom last sex, childhood vaccinations, and adult curative care) would be used by women in the community. In the former black homeland of Transkei, training a health worker in the Expanded Program on Immunization (EPI), for example, was associated with an increase of 8.6 percentage points in the likelihood that a child would receive a DPT3 vaccination. Having a community health worker (CHW) at a clinic increased the likelihood by 10.1 percentage points. The policy implication of these results is that targeted improvements in health service quality can have measurable impacts on health service indicators and health outcomes.

Background

The health status of the population of the Eastern Cape Province of South Africa has historically lagged that of many of the other provinces of the country. However, even within the province, substantial differences in health status exist between subpopulations within different regions, racial groups, and income and educational levels. Data from the 1998 South Africa Demographic and Health Survey (SADHS)[2] confirm and quantify the large inequities that exist between the Eastern Cape Province and other provinces in South Africa, as well as within the Eastern Cape, between the former black homelands and the former Cape Provincial Authority. These data paint an epidemiological picture of a society simultaneously experiencing chronic conditions of lifestyle and aging – conditions typically experienced later in the epidemiological transition – while still struggling to address basic childhood and communicable diseases.

The rich data from the 1998 SADHS are augmented here by data on the government health facilities that serve the population of the Eastern Cape. The 1998 Facility Audit – conducted in 621 government clinics across the province by the EQUITY Project through

[2] The SADHS was conducted by the National Department of Health, the South African Medical Research Council (MRC), and the University of the Free State (UFS) with technical assistance by Macro International.

the Eastern Cape Department of Health with assistance from Management Sciences for Health. These data provide a detailed assessment of the quality of care and service availability in the government health system. Extensive data were collected on staffing, training, availability of services, supplies and equipment, and staff adherence to standard treatment guidelines. Using Geographical Information Systems (GIS), the SADHS and Facility Audit data are linked, i.e. households in each SADHS cluster are linked to the closest government clinic. By combining these data sets, it is possible to evaluate the impact of facility quality and availability relative to the effects of individual and household factors such as wealth, education, and region of residence. Multivariate regression analysis then helps to identify key determinants – and obstacles – to using health services.

Much of the data collected in the SADHS and the 1998 Facility Audit have been ably summarized in other documents, most notably *Primary Health Care in the Eastern Cape Province 1997-2000*. That report profiles the health situation in the Eastern Cape Province, documenting health differentials within the province as well as providing an explicit picture of the functioning of clinics within the government health system. Data were culled not just from the SADHS and 1998 Facility Audit, but also from national clinic surveys conducted in 1998 and 2000, Eastern Cape clinic audits, the District Health Information System (DHIS), and a variety of other health data sources. The report paints a broad picture of the divisions that exist within the country and within the Eastern Cape Province and of the changes that have occurred in recent years to ameliorate those divisions.

In June 2000, MEASURE *Evaluation* was asked to perform a retrospective analysis using the combined 1998 SADHS and 1998 Facility Audit. The main objective of the analysis was to determine the impact of the EQUITY Project on improving the health status of the Eastern Cape population. It was noted, however, that the main inputs of the EQUITY Project were focused on aspects of overall health system development – in particular training and capacity building – that would be difficult to distinguish from other health sector inputs in affecting population-based health behaviors and health outcomes. The evaluation was therefore directed towards determining the impacts of government health services as a whole on health behaviors and health outcomes.

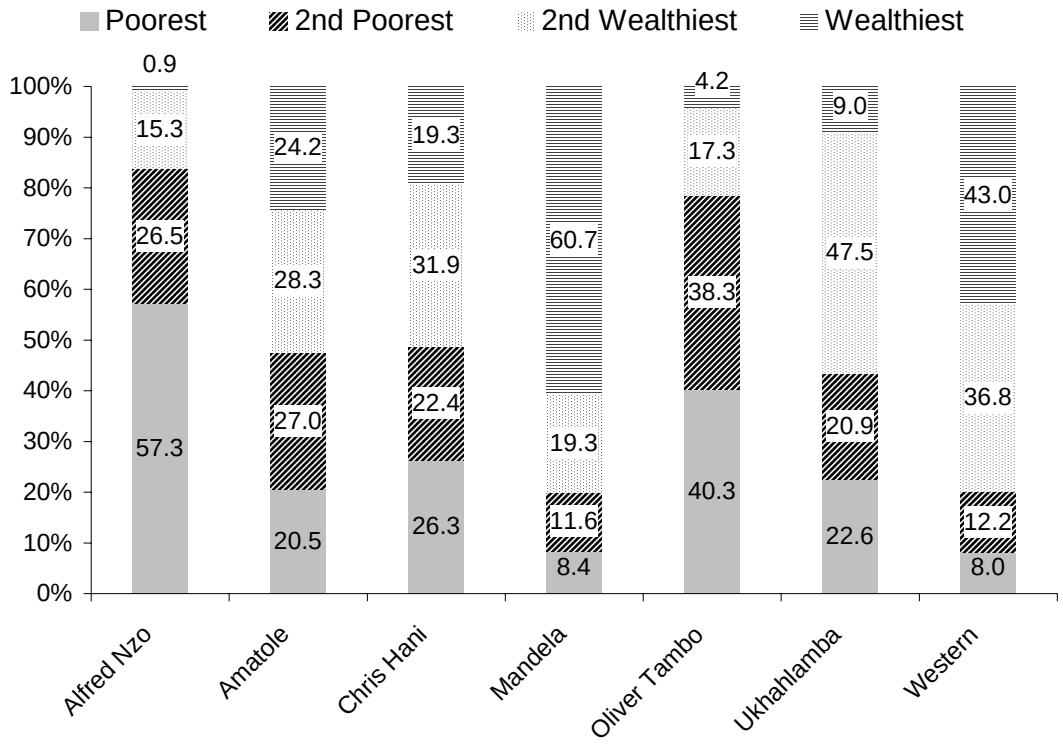
The next section summarizes the sample used in the Eastern Cape Survey, including information on household socioeconomic status, orphanhood, and children's living arrangements. The subsequent section looks at adult and adolescent sexual behavior and HIV/AIDS knowledge. The remaining sections look at fertility and contraceptive use, children's health and mortality, adult health and the evaluation of government clinic impact.

The Eastern Cape Demographic and Health Survey Sample

The overall SADHS sample for Eastern Cape Province included 2,756 women aged 15-49, 1,359 children under the age of five, and 3,374 adult men and women in Eastern Cape Province.

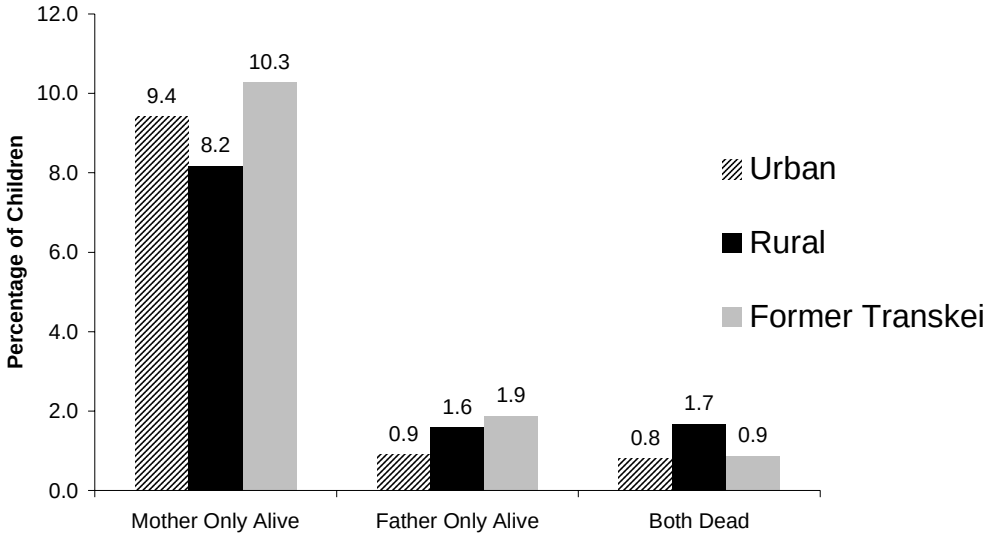
Socioeconomic Status: Using information on ownership of common household assets and amenities, an index of household socioeconomic status was created. Using this index, households were grouped into socioeconomic quartiles from poorest to richest. The poorest district councils were Alfred Nzo – with 57 percent of its population in the lowest asset quartile – and Oliver Tambo – with 40 percent of its population in the lowest asset quartile (Figure 1). The wealthiest district councils were Mandela – with 61 percent of its population in the highest asset quartile – and Western District – with 43 percent of its population in the highest asset quartile.

Figure 1. Distribution of District Council Populations by Asset Quartile



Orphanhood: Twelve percent of children under the age of 15 were orphans (an orphan is any child who has lost a mother, a father, or both parents). Most common were children who had lost only their father (9.5 percent); 1.5 percent had lost a mother only; and 1.1 percent had lost both parents. An additional 3.5 percent were missing information on one or both parents, and therefore did not know whether one or both parents were dead. The rates of paternal and maternal orphanhood were highest in the former Transkei (Figure 2).

Figure 2. Orphanhood Status for Children under Age 15, by Region



Children's Living Arrangements: The most common living arrangement for children was that both parents were alive but the child was living with neither of them (31 percent of children). This arrangement was more common in urban areas (38 percent) and less common in rural non-Transkei areas (20 percent). Other common living arrangements were that the child was living with the mother but not the father (29 perecent) or that the child was living with both parents (22 percent).

Adult Sexual Behavior and Knowledge of HIV/AIDS

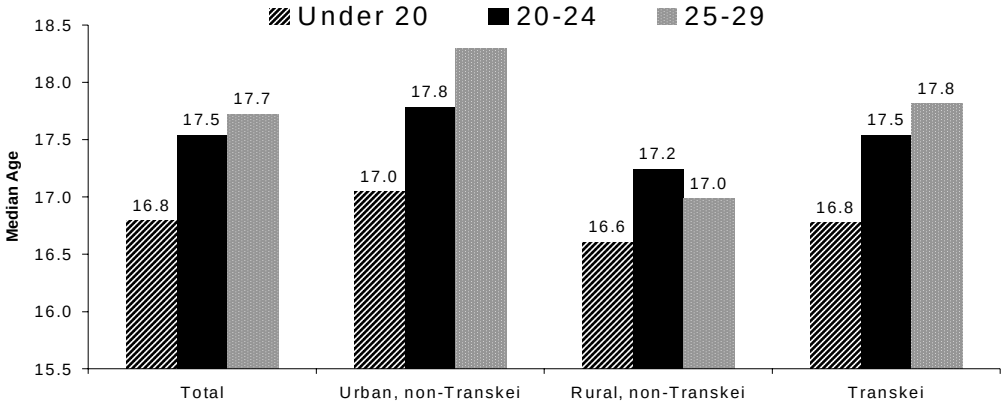
Information was collected from women on the extent of knowledge of AIDS, sources of knowledge, and attitudes and beliefs about HIV/AIDS. The data indicate nearly universal knowledge of HIV/AIDS and mechanisms to prevent transmission but also some misconceptions and stigma related to people with HIV/AIDS. No information was collected from men on knowledge and attitudes regarding HIV/AIDS.

Knowledge and Awareness of HIV/AIDS: Knowledge and awareness of HIV/AIDS among women in the survey was high. Virtually all women had heard of HIV/AIDS and most knew of some means to avoid it – safe sex (87 percent), using condoms (85 percent), and not sharing needles (87 percent). Knowledge and awareness were somewhat lower among poorer and less educated women and women living in Alfred Nzo and Oliver Tambo district councils. Some misconceptions existed regarding transmission

mechanisms, including through mosquitoes, sharing food, or associating with infected individuals. Stigma regarding HIV/AIDS also were apparent among surveyed women. A significant proportion of women (70 percent) believed that health authorities should be informed about an infected individual. Only 17 percent of women reported that they know of someone who was infected or who had died from AIDS.

Age at First Sex: Using survival analysis, the average age at first sex as reported by the women in the survey was calculated to be 16.7 years for women currently under the age of 20, 17.5 years for women 20 to 24 years old, and 17.7 years for women currently 25 to 29 years (Figure 3). These age-specific means for sexual debut indicate that the age at first sex declined over the past decade preceding 1998. Declines were observed in all regions, though the largest declines were observed in urban areas, from 18.3 years to 17.0 years.

Figure 3. Age at First Sex by Age Group and Region of Residence



Condom Use: Condom use during last sex was low – only 8 percent of sexually active women and 5 percent of married women. However, over 60 percent of sexually active women who have ever used condoms reported using them during their last sex. Condom use was higher among more educated women. In fact, among women without any formal education, none reported ever having used a condom. The main reason given for not using condoms was dislike – either the partner disliked using them (39 percent) or the respondent disliked them (26 percent). Other common reasons were because women or their partners preferred sex "flesh to flesh" (10 percent), the women perceived that the risk of getting an STD was low (7.8 percent), and because using a condom suggests lack of trust of the partner (7.2 percent). Lack of availability was cited by only 9 percent of women as the reason for non-use.

Fertility and Fertility Regulation

Fertility

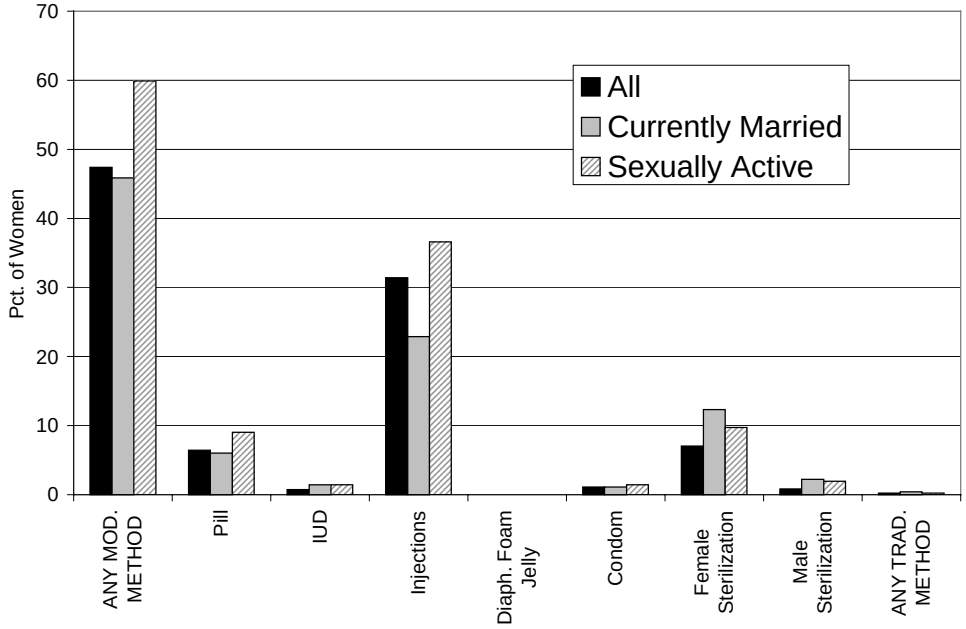
The 1998 SADHS collected information on the complete birth histories of women aged 15 to 49 years of age. This permitted the calculation of total fertility rates, mean age at first sex and mean age at first birth. It also allowed a fuller examination of teenage pregnancies.

Fertility: The total fertility rate for the province was 3.5 live births per woman. This rate varied from a high of 5.0 births per woman in Oliver Tambo to a low of 2.1 births in Western District. Women in rural areas averaged two additional births relative to women in urban areas – 4.3 births versus 2.3 births. Women in the lowest asset quartile also averaged two more births than women in higher asset quartiles. The mean interval between births was 58 months, highest in Western District (86 months) and lowest in Alfred Nzo (48 months) and Oliver Tambo (48 months).

Fertility Regulation

Nearly all women had heard of some form of contraception; and most had, at some point in time, used some form of contraception. Overall, the prevalence of modern contraception was approximately 60 percent of sexually active women, 47 percent of married women, and 45 percent of all women aged 15-49 (Figure 4). Injections were the most common currently used method – 37 percent of sexually active women, 23 percent of currently married women, and 31 percent of all women. Proximity was the main reason for choosing a particular provider. Use of condoms as a form of contraception was extremely low. Only 2 percent of sexually active women used condoms as their regular source of contraception, but ever use of condoms and use of condoms during last sex were somewhat higher – 15 percent and 8 percent respectively.

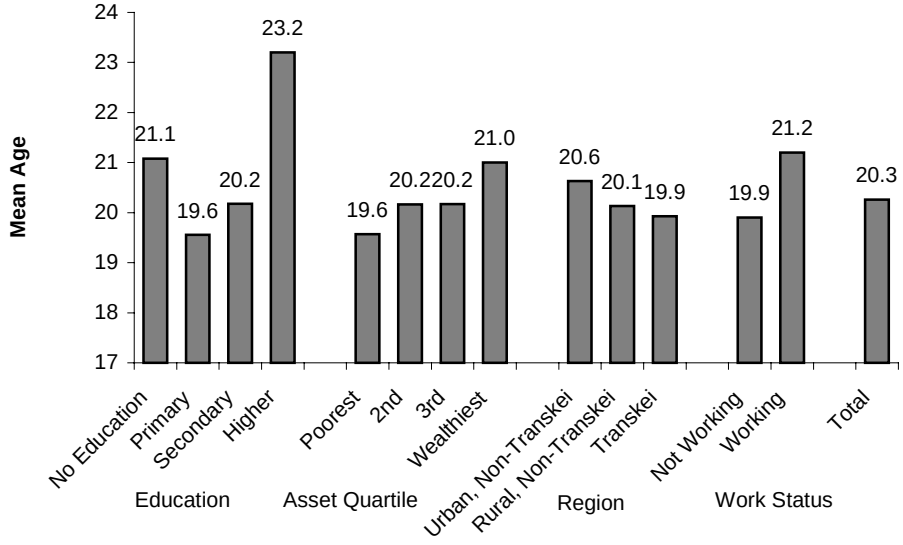
Figure 4. Current Use of Contraceptive Methods by All Women, Married Women, and Sexually Active Women



The unmet need for family planning – the proportion of fecund women who are not currently using contraception and who say that they want no more children (limiting) or want to wait two or more years to have the next child (spacing) – was approximately 21 percent. Most of this need (16.7 percent) was for limiting additional births. Unmet need was highest in the former Transkei (28 percent) and lowest in urban areas.

Age at First Birth: The median age of first birth was 20 years (Figure 5). By the age of 18, approximately 20 percent of teenagers have given birth or are currently pregnant.

Figure 5. Mean Age at First Birth by Education, Assets, Region, and Work Status



Child Mortality and Child Health

The same birth histories that allow calculations of fertility rates also permit calculations of infant and early childhood mortality rates. Information on recent pregnancies and children's health histories permit examinations of use of antenatal care, childhood vaccinations, and recent children's illnesses.

Mortality: For the province as a whole, the infant (less than 1 year) and under 5 mortality rates were 61 and 80 deaths per 1,000 live births (Figure 6). The infant mortality rate in the former Transkei (83 deaths per 1,000 live births) was more than twice that of urban areas (35 deaths per 1,000 live births) and 60 percent higher than other rural areas (51 deaths per 1,000 live births) (Figure 7). There was some evidence of a decline in mortality rates over the period 1983-1998 (Figure 8), though much of this decline was in the early years and there was some evidence of an increase in mortality over the period 1994-1998. Mortality was clearly associated with socioeconomic status; the infant mortality rate for the poorest half of the population was more than twice as high as for the upper 50 percent of the population (Figure 9). Mortality was also associated with the age of the mother, parity, and household amenities. The risk of early childhood mortality was nearly three times higher for children of mothers who were less than 16 years old at the time of birth. Similarly, the risk of mortality was three times higher for parity 7 or higher children and two times higher for parity 4 to 6 children relative to first births. Other factors such as having natural water sources – relative to having piped water – also contributed to greater mortality risk.

Figure 6. Early Childhood Mortality Rates, 1989-1998

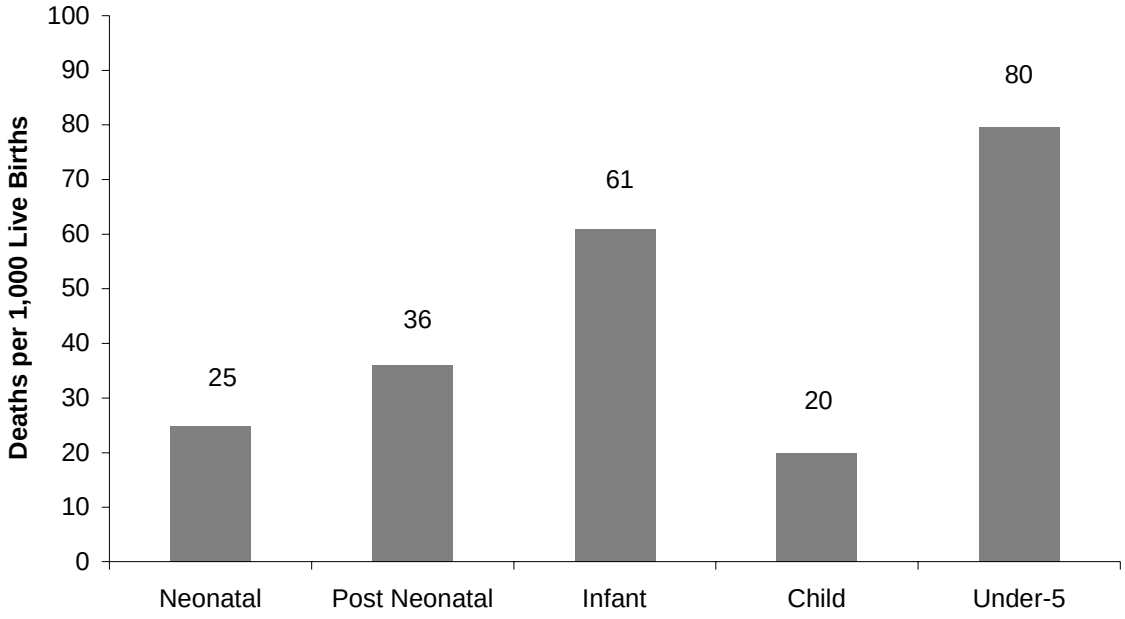


Figure 7. Infant Mortality Rates by Group, 1989-1998

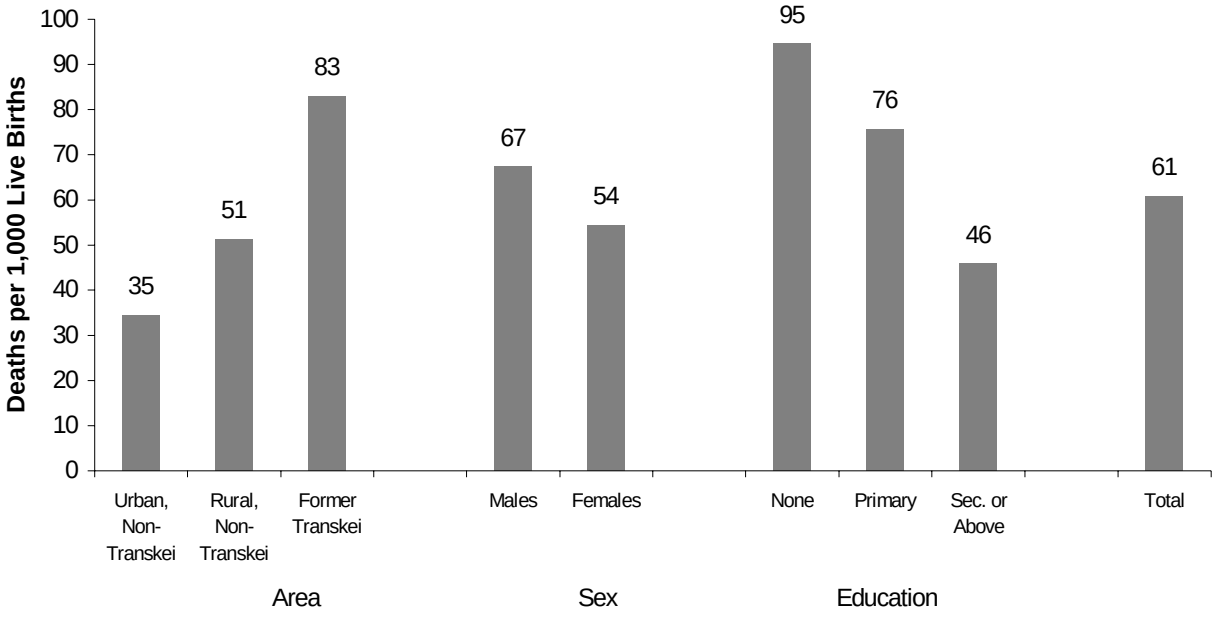


Figure 8. Trends in Childhood Mortality, 1983-1998

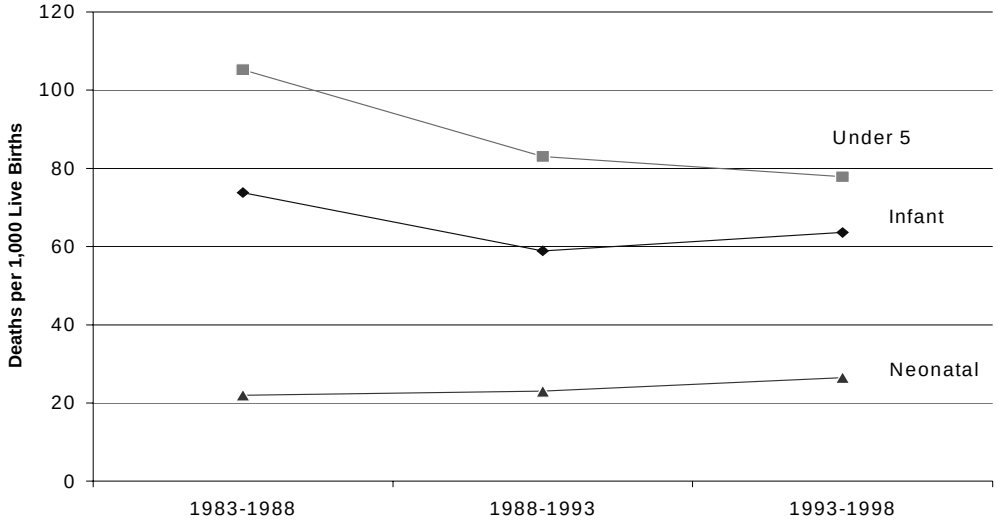
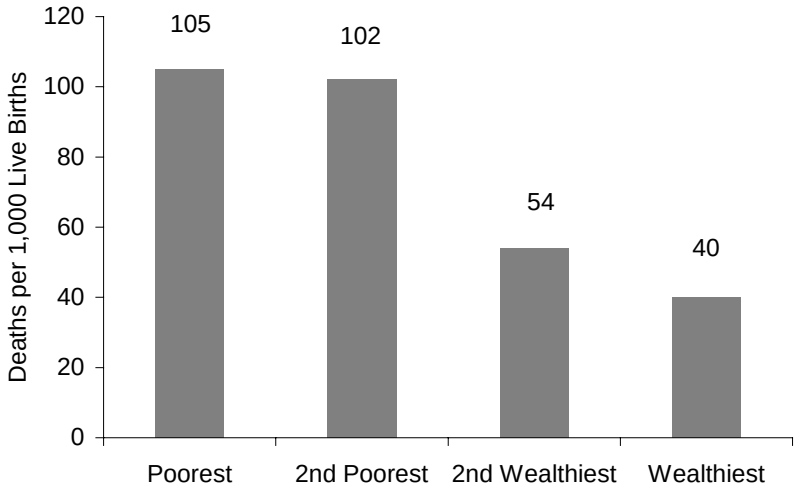


Figure 9. Under 5 Mortality Rates by Wealth Quartile, 1989-1998

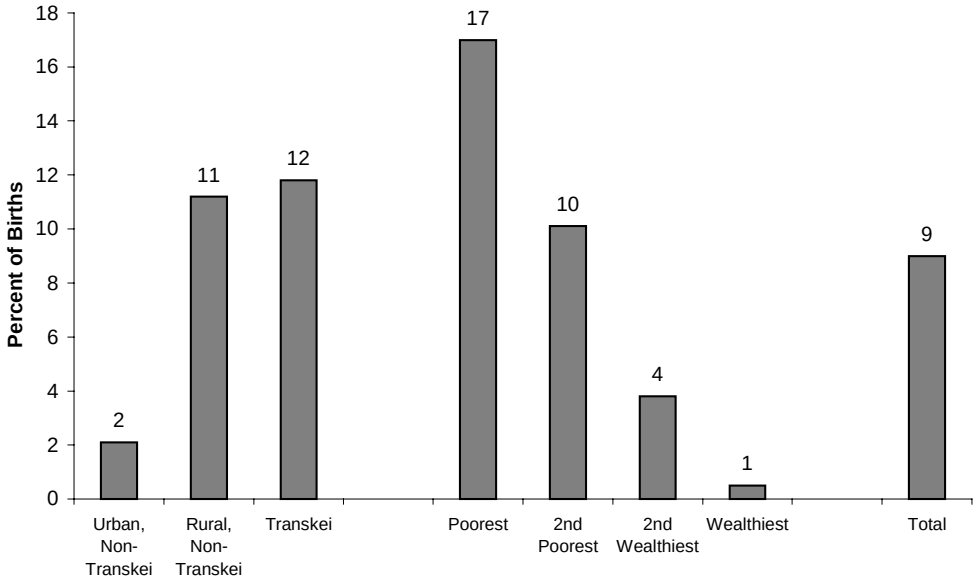


Antenatal and Delivery Care: Antenatal care was used by 95 percent of pregnant women. The majority of women received their antenatal care from a trained nurse or midwife (83 percent); most of the remainder received antenatal care from a doctor (12 percent). Approximately 70 percent of women giving birth in the five years preceding the survey delivered in modern medical facilities. A much higher percentage of women in the former Transkei (37 percent) delivered at home than in other rural areas (26 percent) and in urban areas (4 percent).

Information was also collected on children's birth weight for the 60 percent of children with growth cards on which birth weights were recorded. Only 9 percent of newborns were considered to be underweight (Figure 10). This rate was highest among the poor, in

which 17 percent of newborns were considered to be underweight. Only 1 percent of newborns of wealthy households were considered to be underweight. A positive trend was also noted in birth weights, with the estimated birth weight – including imputed birth weights for children without growth cards – increased from a mean of 2,588 grams in 1993 to 2,773 grams in 1998.

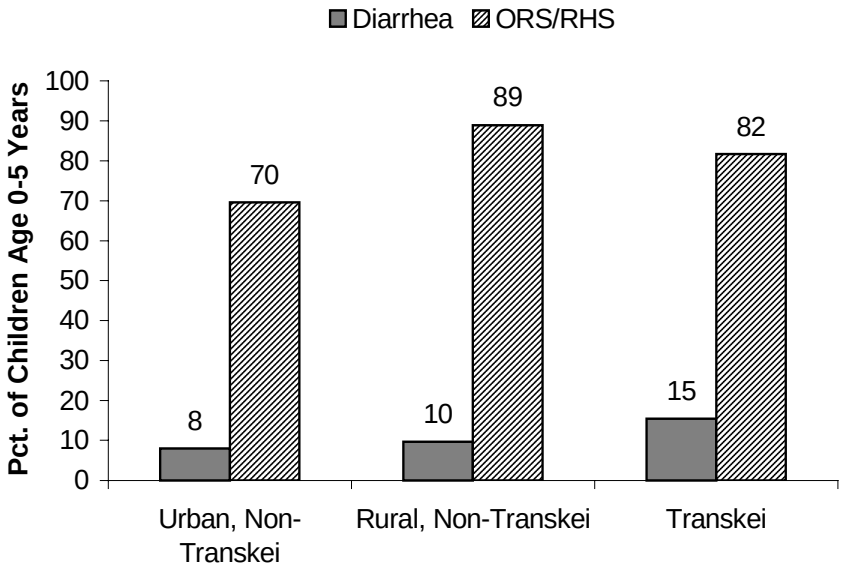
Figure 10. Proportion of Births that Were Underweight



Child Health: Children's health outcomes – diarrhea prevalence, acute-respiratory infection prevalence, immunization coverage – were considerably worse in Alfred Nzo and Oliver Tambo district councils than elsewhere.

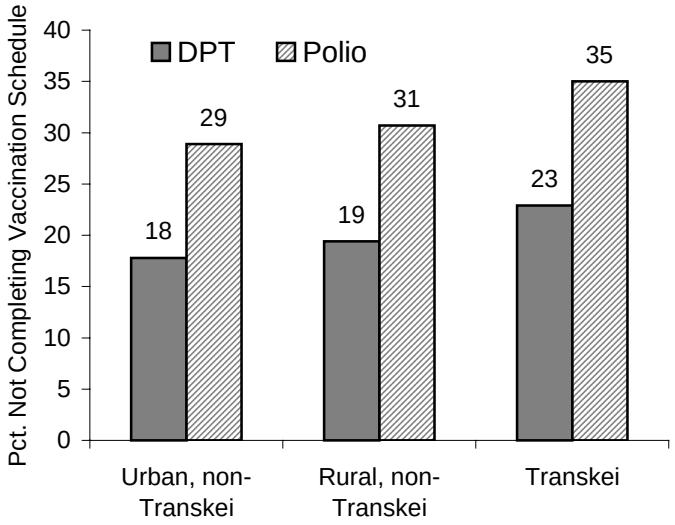
Overall, the prevalence of diarrhea in the two weeks prior to the survey was 12.7 percent in the province as a whole. Diarrhea prevalence was lowest in urban non-Transkei areas (8 percent) and highest in the former Transkei (15 percent). Treatment with oral hydration salts (ORS) or a suitable rehydration solution ranged from 70 percent in urban non-Transkei areas to 89 percent in rural non-Transkei areas (Figure 11). The prevalence of acute respiratory infection (ARI) was 14.6 percent of children under age 5, a rate roughly similar throughout urban, rural, and former Transkei areas. Treatment for ARI was 19 percentage points higher in urban non-Transkei areas (89 percent) than in the former Transkei (70 percent).

Figure 11. Diarrhea Prevalence and Treatment with Oral Rehydration Salts or Recommended Home Solutions



Over half of all children were not receiving the recommended childhood vaccinations (Figure 12). Only 46 percent of children aged 12 to 23 months had received the full set of DPT3, Polio, BCG, measles, and hepatitis vaccinations. Drop-out rates were high. Almost 87 percent of children got their first polio vaccination but only 61 percent completed the series. Over 90 percent received their first DPT but only 68 percent got all three. Eighty percent received their first hepatitis B but only 60 percent received their third.

Figure 12. Drop-out Rates for DPT and Polio by Residence



Breastfeeding: Exclusive breastfeeding was almost non-existent in the Eastern Cape. From birth, most children were given a diet that included water and other liquids. The

median duration of breastfeeding duration was over nine months but varied by region. Children in urban areas were breastfed only five months on average. Breastfeeding duration was longer among poorer households with less hygienic water supplies.

Adult Health

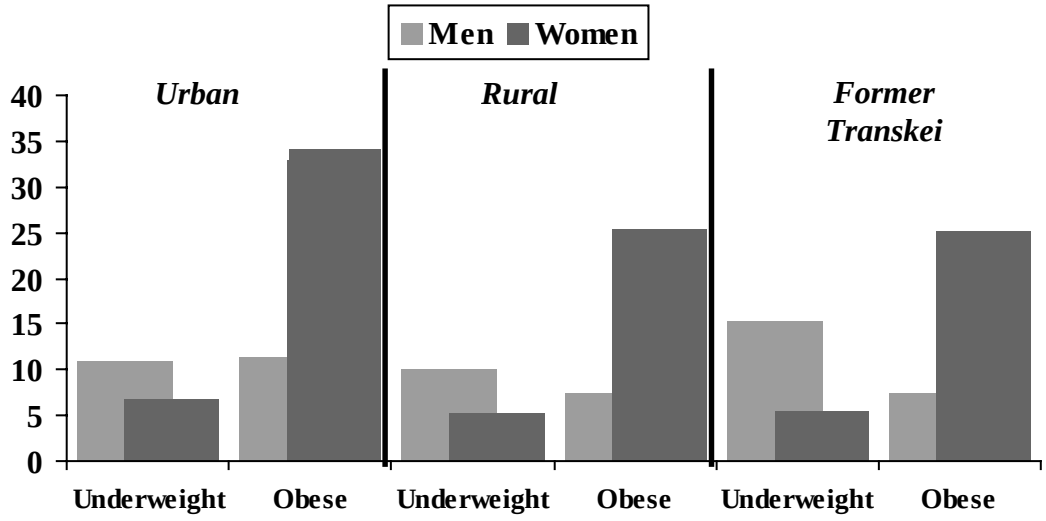
The adult questionnaire collected information on a variety of adult health problems and behaviors. Specifically, information was collected on use of health services, family medical histories, chronic ailments, dental health, occupational health, medications, and habits and lifestyle. In addition, anthropometric data were collected on an interviewed person's height, weight, blood pressure, peak expiratory flow rate (PEFR) and pulse. Combining this information, it was possible to link a variety of clinically measured data with socio-economic and socio-demographic information. The result is a unique epidemiological situation of a society simultaneously experiencing morbidity from both communicable diseases and chronic diseases generally evident further along in the epidemiological transition.

Obesity and Hypertension: Nearly half of the Eastern Cape population was classified as overweight (24.2 percent) or obese (21.1 percent). Women were nearly three times as likely as men to be classified as obese (Table 1). The prevalence of obesity was also considerably higher among individuals who were wealthier – women in the highest asset quartile were 18 percentage points more likely to be obese than women in the poorest asset quartile (37.8 percent versus 20.0 percent) – and among adults who lived in urban non-Transkei areas (Figure 13). Multivariate logistic regression indicated that adults with a standard 4 or greater education were more than three times as likely to be obese, as were adults in the highest asset quartile.

Table 1. Percent distribution of men and women by Body Mass Index (BMI)

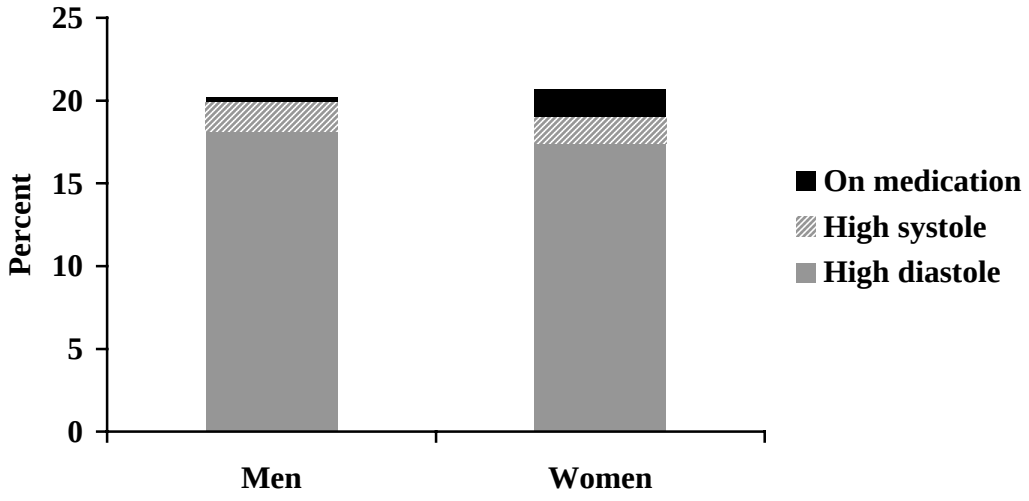
	BMI					
	<18.5 (Underweight)	18.5-24 (Normal)	25-29 (Overweight)	30+ (Obese)	Total	N
Men	11.6	58.0	21.0	9.4	100.0	1310
Women	5.9	39.0	26.3	28.8	100.0	1978
Total	8.2	46.6	24.2	21.1	100.0	3288

Figure 13. Percent Underweight and Obese Men and Women, Comparing Former Transkei with Other Urban and Rural Areas



Nearly one fifth of the adult population was classified – either by measurement or because they were taking medication – as having hypertension (Figure 14). In multivariate logistic estimations, hypertension was associated with older adults, higher levels of education, or with being white or Asian and being in urban areas (relative to being in the former Transkei). Nearly one-third of men and women with no education, for example, were classified as hypertensive as compared with only 19 percent of men and 16 percent of women with a standard 6-9 education. Hypertension in urban men was approximately 7 percentage points higher than in rural men and 9 percentage points higher than in rural former Transkei men. Diabetes was reported by approximately 3 percent of men and 4 percent of women.

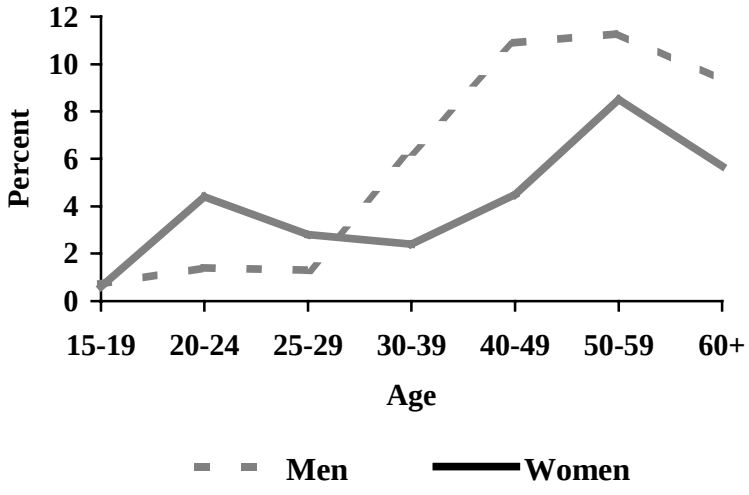
Figure 14. Prevalence of High Blood Pressure among Men and Women



STD Symptoms: Approximately 14 percent of men aged 15+ reported symptoms of a genital discharge syndrome (GDS), and 4 percent reported symptoms of genital ulcer syndrome (GUS). The odds of GDS were higher among older men and men with a Sub A- Standard 3 education and men who smoked or drank, but were lower among men in the former Transkei.

Tuberculosis: Approximately 4 percent of women and 6 percent of men reported having ever had at least one episode of tuberculosis (TB) confirmed by clinic personnel (Figure 15); 22 percent of those occurred in the past year. Reporting of TB was higher among poor and less educated adults. Ever reporting of TB was higher in the former Transkei.

Figure 15. Percent of Men and Women Who Have Ever Had Tuberculosis, by Age



Adult Curative Care: A significant proportion of adults (18 percent) reported having used a government hospital or clinic in the past month, but a significant proportion also reported having used a private doctor, hospital or clinic (12 percent). Satisfaction was higher at private providers. Use of private care was positively correlated with income.

Lifestyle: Close to 40 percent of men and 10 percent of women reported that they smoke. Sixty percent of men and one-fifth of women reported that they drink either daily or on weekends. Smoking rates were lower in the former Transkei than elsewhere, but drinking rates were higher.

Impact Evaluation of Service Availability and Quality on the Demand for Health Care Services

The extensive data on the health and health care behaviors available in the 1998 SADHS can be linked with other sources of data, such as the 1998 Facility Audit, to provide a more nuanced view of the different factors affecting the health of the Eastern Cape Population. This section combines data from the 1998 SADHS and the 1998 Facility Audit to analyze how the characteristics of households, individuals, and health care clinics combine to influence the use of different primary health care services.

The methodology used to examine these inter-relationships is multilevel analysis using statistical techniques such as maximum likelihood probit or logit estimation or ordinary least squares linear regression. These statistical techniques allow us to examine, simultaneously, the effects of multiple sources of influence on individual health outcomes or health care seeking behaviors. These multiple sources of influence can arise from multiple levels: from the individual and household level, including factors such as socioeconomic status, levels of education, age, parity, or knowledge and awareness of health services; from the community level, including factors such as norms, attitudes and stigma surrounding health, health maintaining practices, or health services in general; or from the health facility level, including such factors as proximity of health services, ranges and types of services, quality of care, staffing, or availability of key drugs and supplies.

Multilevel regression analysis has advantages over simple bivariate analyses, which seek to examine the relationship between two variables – education and use of family planning, for example. A researcher may find a strong positive relationship between the level of education that a woman has and the likelihood that she will be using modern contraception, and naively conclude that education is the sole cause of the higher levels of contraceptive use. But bivariate analyses may hide important confounding relationships, such as the strong correlation between levels of education and living in urban areas, which may mean that services are closer to individuals; or between education and socioeconomic status, which may mean that women are better able to afford to use health services or to use health services of higher quality. A simple bivariate analysis may therefore overstate the effects of education on the likelihood that a woman uses modern contraception; more educated women may in fact be more likely to use

modern contraception, but they may also be more likely to live closer to health services and be better able to afford those health services. In contrast, the statistical techniques of multilevel regression analysis allow us to tease out the independent influences of these multiple types and levels of factors, determining the relative influence of each – income, education, awareness, community attitudes, proximity, quality of services, or availability – on contraceptive use.

In the Eastern Cape analysis, we know that many of the health outcomes and behaviors are far worse in the former Transkei than elsewhere. However, we also want to know what the principal associative factors are that help to explain these differences. Is it that women in former Transkei are more remotely located, making accessing health services more difficult? Or is it that lower levels of education in the former Transkei are associated with women placing a lower value on health services or having a lesser knowledge of their benefits or availability? Or is it that the services that are available at government clinics in the former Transkei (and their alternatives) are of a lower quality, thereby reducing their effectiveness when they are used or making individuals less likely to use them? Finally, as is likely, is it some combination of all of these factors or is it simply something unique about the former Transkei?

Using information on the Global Positioning System (GPS) positions of the areas in which surveyed households reside and the positions of government clinics in the 1998 Facility Audit, it was possible to link households with the government clinics that were closest to them. By linking households to the facilities that are in the areas in which they live, we can obtain additional information on factors – specifically those factors that are related to the facilities themselves and not to individuals and households – that may affect whether or not people use health services such as modern contraception. By looking at how far away the clinics are, the type of staff that they have, the services that they offer, and the existence of necessary drugs and supplies, it is possible to determine the influences of service quality and accessibility that affect people's decisions to seek care or not. Then, using multivariate regression techniques such as maximum likelihood probit or ordinary least squares regression, it is possible to test many of the questions above about the relative effects of individual, household and facility characteristics on individual behaviors. Using these methodologies, we can have a more explicit understanding of the reasons why a woman, for example, does or does not use antenatal care, deliver with a doctor, have her children immunized or take her children to a doctor when they are ill.

In order to examine with greater statistical rigor the questions discussed above, we use the combined data from the SADHS and the Facility Audit to perform multilevel analysis on several different health behaviors that may be influenced by the characteristics of individuals, households and clinics:

- use of modern contraception and unmet need
- childhood immunizations (DPT3, Polio3, Measles, Full Coverage)
- use of antenatal care and delivery assistance at birth
- use of government health facilities by adults in the past 30 days
- knowledge and awareness of HIV/AIDS.

The analysis focused solely on access to services in rural areas – both former Transkei and other rural areas. This was because the Facility Audit did not collect information on all of the facilities in the province – just government clinics. In urban areas, there are likely to be many other providers of health care than those government clinics. Without information on these other providers, we have an incomplete picture of the range of services available to households. This may lead us into erroneous conclusions about the effects of quality and service availability of government clinics. For example, a household in an urban area may be located next to a very good government clinic, perhaps better than rural government clinics, but choose never to use it because there are even better private clinics nearby. Without information on these private clinics, we may make the erroneous conclusion that being near a very good government clinic decreases the likelihood that government clinics will be used. As a result, we look only at rural areas, where we can be more confident that in areas where there are government clinics, there are far fewer alternatives. In cases of services that are supplied predominantly by government facilities – pills, injections, condoms, delivery assistance – we can have a good sense of the actual choices that women make since the choice generally reduces to either using the government clinic or doing nothing.

Much of this analysis also distinguishes between behaviors – the use of specific health services – by households in the former Transkei and households in other rural areas. Specifically, we are interested in all of the questions asked above: are households in the former Transkei different from those in other rural areas in ways that affect whether they use government clinics? Or are government clinics in the former Transkei different from those in other rural areas in ways that affect their use?

Using data from the 1998 Facility Audit and subsequent surveys, it is possible to note considerable improvements in the quality of the health care system in Eastern Cape Province (Table 2). From 1997 to 1999, the percentage of clinics offering the nine basic primary health care services at least five days per week increased from 42 percent to 64 percent; the availability of key antibiotics (ciprofloxacin and benzathine penicillin) increased from 55 percent to 75 percent; the percentage of STD cases treated appropriately increased from 54 percent to 70 percent; and the percentage of clinics with condoms tripled from 27 percent to 76 percent.[3]

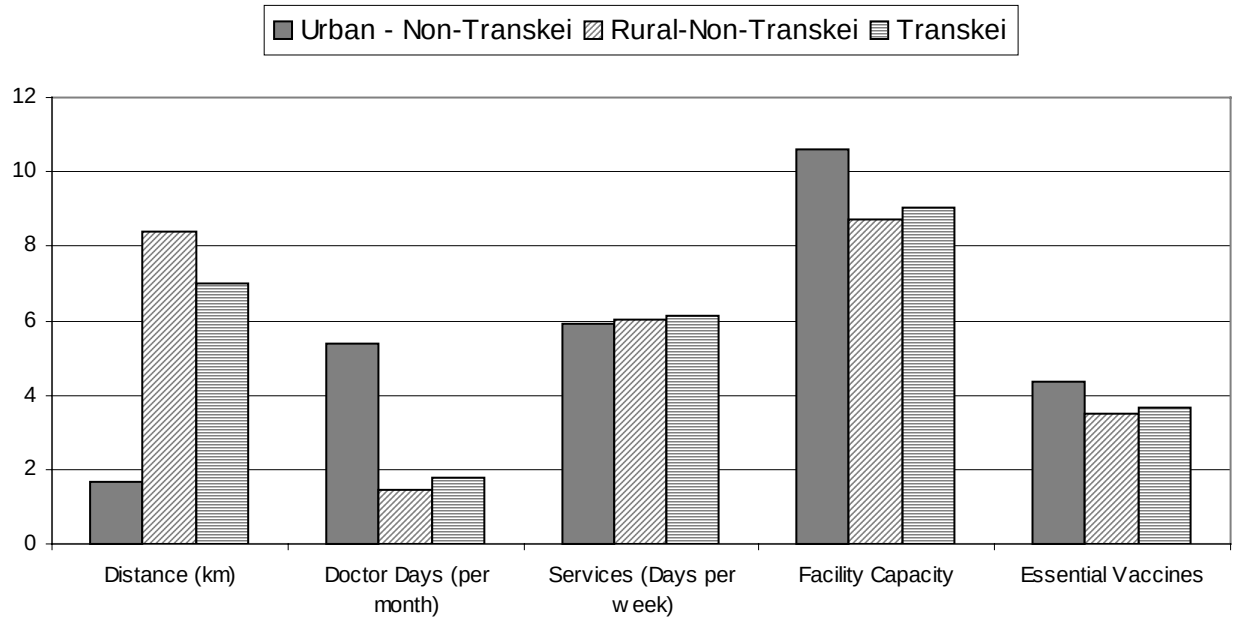
[3] Management Sciences for Health (MSH). *Indicators of Health Status and Health Services in the Eastern Cape Province & South Africa.* Bisho, South Africa: MSH; 2000.

Table 2. Changes in quality of care indicators

	1997/1998	1999/2000
Percentage of Clinics with These Services:		
All 9 PHC services at least 5 days per week	42	64
MCH services 5 days per week	51	93
Clinics with a supervision visit in past month	64	77
Percentage of Clinics with These Supplies:		
Ciprofloxacine and benzathine penicillin	55	75
Cotramoxazole	64	80
Clinics with 7 indicator drugs	59	92
Clinics with catchment area maps	13	82
Clinics with condoms	27	76
Percentage of Clinics Meeting These Performances:		
STD cases treated appropriately	54	82
TB treatment completion	49	60
Correct clinical treatment of diarrhea	41	82

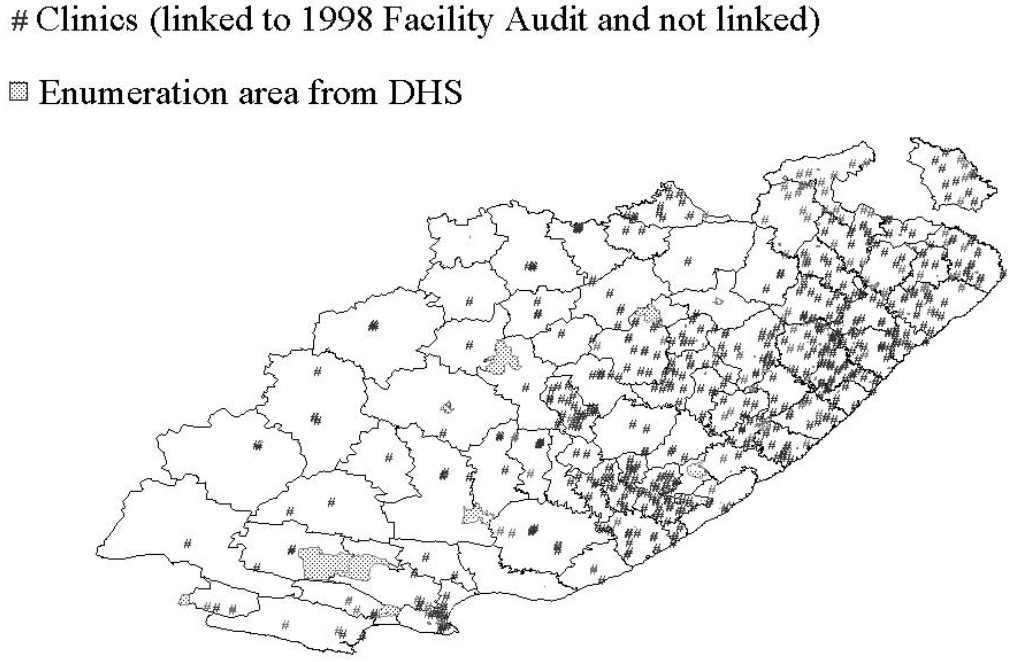
The substantial improvements in the quality of government facilities may have done much to reduce differences in the quality and availability of government health services in the former Transkei and elsewhere. Differences in the quality and availability of services at government clinics in the former Transkei and other rural areas were less than what might be expected and therefore seem unlikely to explain differences in health behaviors. For example, clinics in both areas on average offered six essential services at least five days per week (Figure 16). Clinics in the former Transkei, in fact, scored higher on an index of facility capacity that measured availability of vaccines, drugs, and equipment and on an index of the availability of five essential vaccines. The number of days per month that a doctor was present, on average, at a government clinic was also slightly higher in clinics in the former Transkei. In terms of physical accessibility, clinics in the former Transkei were also 1.3 kilometers closer (7.0 kilometers versus 8.3 kilometers) to women than clinics in other rural areas. In both areas, approximately 90 percent of nursing posts were filled.

Figure 16. Facility Characteristics by Region



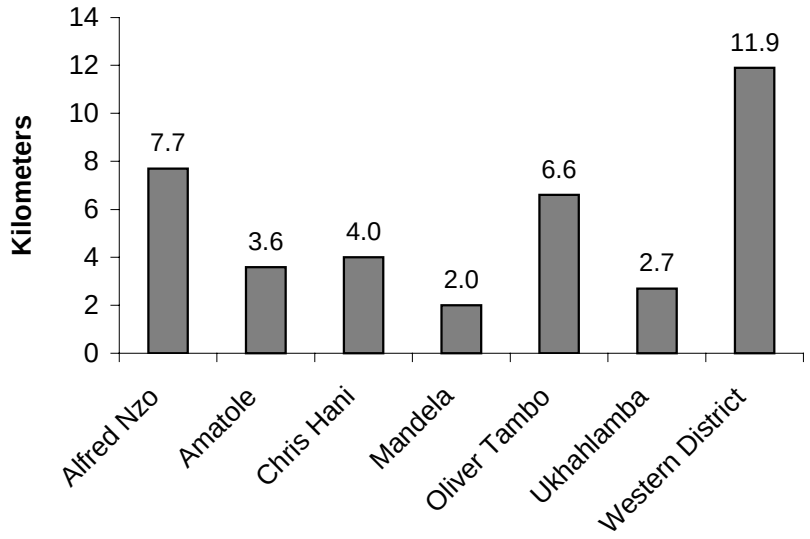
In order to assess the effects of health services on individuals' health outcomes – and therefore the potential contributions of the EQUITY Project – it was necessary to link each household with the corresponding health services available to it. GIS data were used to precisely locate the government clinics in the Facility Audit and the enumeration areas in the SADHS (Figure 17). Using the geographical center of each of the 209 SADHS enumeration areas as the approximate location of households, the distance was calculated from the center of the enumeration area to the closest government clinics for which data were available from the 1998 Facility Audit and which had geographical coordinates from GIS data. Each enumeration area was linked in this manner to the five closest clinics. The characteristics of these government clinics in the Facility Audit data were then linked to the households in the enumeration area. This information was then used to depict the service supply environment in which individuals and households live.

Figure 17. Linking the DHS Data with the Facility Audit Data



Using this methodology, it was possible to calculate the mean distance from each enumeration area to the closest clinic. Overall, it was found that households were farthest from a government clinic in Western district (11.9 kilometers) and Alfred Nzo (7.7 kilometers) and closest in Mandela (2.0 kilometers) (Figure 18).

Figure 18. Mean Distances from Enumeration Areas to Closest Clinic for District Councils



Estimation Results and Policy Simulations

Many individual, household and facility characteristics were examined in detail to determine their effects on the use of essential health services. Using the MLA estimation results, the effects of changes in different individual and facility characteristics can be simulated. The results and the subsequent simulations indicate that individuals were more likely to use facilities that were of measurably higher quality, regardless of where the individuals lived.

A higher proportion of allocated staff posts that were filled, as well as the type of staff present, had discernible impacts on several outcomes. For example, having all nursing posts filled at the local government clinic increased the likelihood that a woman would use modern contraception by approximately 5 percentage points in both the former Transkei (from 32.3 to 37.5 percent of women) and other rural areas (from 56.6 to 61.3 percent of women). For DPT3 vaccinations, the impacts were larger in the former Transkei – nearly 20 percentage points – but negligible in other rural areas. Having a CHW at a clinic increased the likelihood that a child would receive a DPT3 vaccination by 20.1 percentage points in the former Transkei and by 16.9 percentage points in other rural areas. Other staffing variables, such as the number of days that a doctor was present at the clinic per month, had mixed results, yielding no impacts on the use of modern contraception nor on the use of condoms in the former Transkei but positive effects on condom use in non-Transkei rural areas.

In non-Transkei rural areas, incremental changes in an index of facility capacity were calculated to increase the likelihood that a woman used a condom during her last sexual episode by 3.4 percentage points, from 6.2 percent to 9.6 percent. Similar increases in the former Transkei would increase contraceptive use by 2.4 percentage points, from 37.9 percent of women to 40.3 percent of women.

In many cases, the effects of facility characteristics had different impacts in the former Transkei and in other rural areas. Greater availability of supplies and equipment increased contraceptive use by 2.4 percentage points in the former Transkei but had no measurable effect elsewhere. Recent supervision visits by local health officials – perhaps a proxy for higher clinic quality – increased the likelihood of contraceptive use by 5.6 percentage points in the former Transkei but by 9 percentage points elsewhere. Having a community health committee at a clinic increased condom use during last sex by 6.5 percentage points in non-Transkei rural areas but by only 2.2 percentage points in the former Transkei.

Training

The 1998 Facility Audit collected information on whether clinic staff had received additional in-service training in specific areas such as family planning, child health and other essential health services. Additional training would be expected to augment the capacity of the local clinic to deliver effectively essential services and therefore to increase the likelihood that essential services would be used by women. In several cases, this appeared to be true.

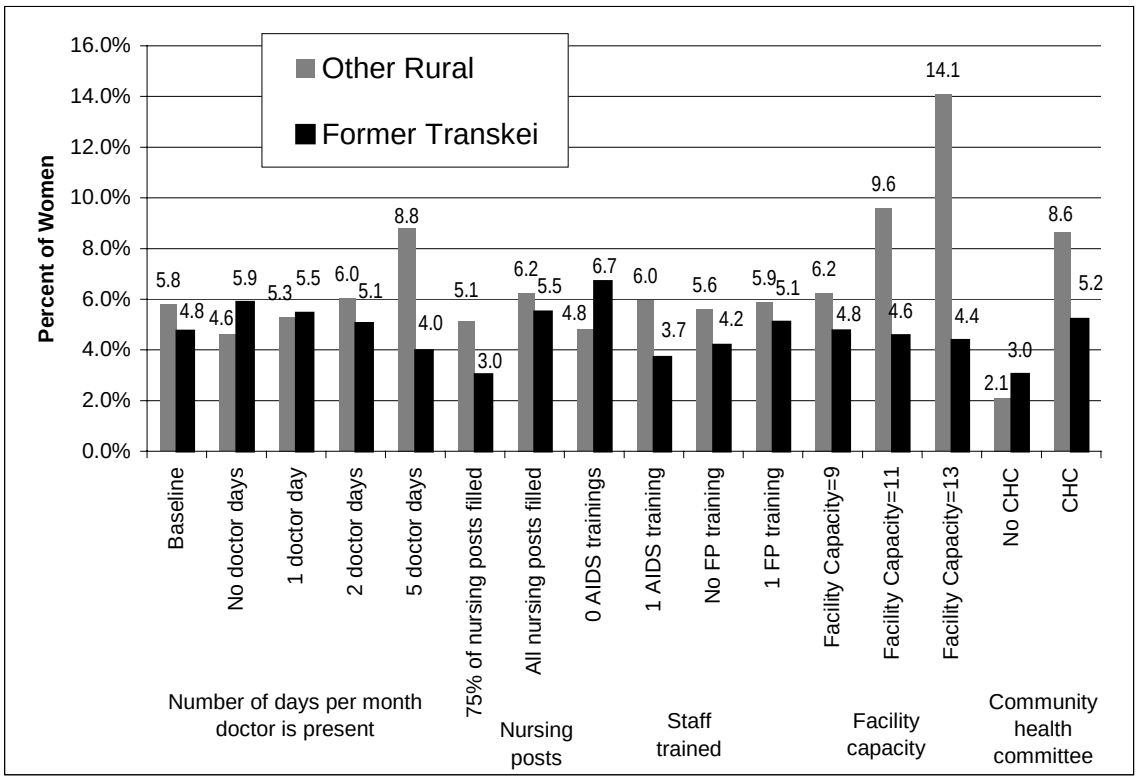
Recent training of staff in EPI increased the likelihood that a child in the former Transkei was vaccinated by 8.6 percentage points – from 54.8 percent to 63.4 percent of children 12 to 35 months. In other rural areas, it had negative impacts on vaccinations. Other impacts of staff training were considerably smaller. Training of staff in HIV/AIDS increased the likelihood of condom use during last sex in non-Transkei rural areas by only 1.2 percent and did not increase condom use elsewhere. Training in family planning increased condom use by 0.3 percentage points in non-Transkei rural areas and by 0.9 percentage points in the former Transkei.

Education, Wealth, and Individual Characteristics

While facility characteristics have measurable effects on the use of key services, the characteristics of individuals themselves seem to have considerably larger effects. In non-Transkei rural areas, use of a condom during last sex – while low for all individuals – was predicted to be seven times higher for women with a secondary education than for women with no education and four times higher than for women with only a primary level education (Figure 19). In the former Transkei, the gap was similar; having a secondary level education would increase condom use during last sex by 7.4 percentage points – from 0.3 percent for women with no education to 7.7 percent for women with a secondary level education. The predicted effects of education on modern contraceptive use were even larger. In the former Transkei, having a secondary level education increased modern contraceptive use by 8 percentage points relative to having only a primary level education and by 27 points relative to having no education. In non-Transkei rural areas, nearly two-thirds of women with a secondary education would use modern contraception but only half of women with primary education would.

Wealth had a similarly strong effect on the use of health services in both the former Transkei and other rural areas. Relative to being in the poorest asset quintile, women in the former Transkei in the highest asset quintile were 14.6 percentage points more likely to use modern contraception (34.1 percent versus 48.7 percent). This differential was similar in non-Transkei areas. In the former Transkei, women in the highest asset quintile (13.5 percent) were four times as likely to use a condom during last sex as women in the poorest asset quintile (3.4 percent). The difference across women in non-Transkei areas was only 2.9 percentage points.

Figure 19. Simulated Effects on Use of Condom Last Sex, Former Transkei and Other Rural Areas



Policy Conclusions

This report has attempted to use data from the 1998 SADHS to reveal strong disparities within the Eastern Cape Province between different regions and population sub-groups. The differences are most stark between the former Transkei and other regions of the province. This should hardly be a surprise to those familiar with the province, but perhaps the size of some of the disparities and the factors that affect those disparities are a cause for surprise.

This report has also pointed out some other interesting phenomenon. Among the Eastern Cape population, an epidemiological phenomenon is occurring. Residents of the Eastern Cape are afflicted by conditions generally seen later in the epidemiological transition – obesity, hypertension, heart problems – while children continue to be afflicted by basic

childhood illnesses. One third of women are considered to be obese and approximately one fifth of adults are suffering from hypertension. Most of the latter group is not receiving treatment. Only half of all children, on the other hand, are receiving the full set of vaccinations, and child mortality in some areas is akin to levels seen in countries of considerably lower income levels.

This report has also traced the impacts of facility quality and service availability on health behaviors and health outcomes. Results have been presented from multilevel analyses in which we link the SADHS with the 1998 Facility Audit of government clinics in the Eastern Cape. Results from these analyses indicate that individual, household, and clinic characteristics influence the decision about whether to use available health services. On the individual side, the most important characteristics are wealth, as measured by our index of household assets, education, and location (urban non-Transkei, rural non-Transkei, Transkei). For nearly all health indicators, adults, women, and children in urban areas fare better than those in rural non-Transkei and Transkei. These effects are observed even when we control for the other factors, such as higher levels of education, wealth, and clinic quality and availability in urban areas. The differences between rural non-Transkei areas and the former Transkei are considerably smaller, but still measurable.

The multilevel results provide some reason for concern. In several of the estimations, training of health workers shows significant impacts on whether health services are used. However, the 1998 Facility Audit indicates that a disproportionate amount of training of health workers occurred in regions with already high health indicators, rather than in those areas where health indicators are the worst. This would seem to be contrary to what is necessary to redress regional inequities. Further, we find that staffing indicators – doctor days per month and percentage of nursing posts filled – significantly affect use of services. This means that, if additional doctors and nurses could be placed in the previously underserved areas of the former Transkei (either through redistribution or new hiring), we might expect significant improvements in health outcomes. On the positive side, therefore, there is evidence that historical inequities can be redressed at least in part by improving the quality of health services and increasing the availability of trained staff.

An additional use of the estimation results is to combine these data with data collected elsewhere on the costs of different reform strategies. In such a way, it is possible to perform basic calculations of the cost-effectiveness of different reform strategies. For example, using the results from the first estimations examining modern contraceptive use, we find a smaller impact on contraceptive use from increasing the number of days that a doctor is present at a clinic as compared with filling all nursing posts. However, adding an additional nurse full-time at a clinic could be more expensive than having a doctor visit a few more days per month. As a result, the latter could be more cost-effective. Such analyses are possible but, without adequate data on the costs of different interventions, are beyond the scope of this work.