MEASURE Evaluation

Working Paper Series

Community and Health Facility Influences on Contraceptive Method Choice in the Eastern Cape, South Africa

September 2007

WP-07-99

MEASURE Evaluation is funded by the U.S. Agency for International Development (USAID) through Cooperative Agreement No. GPO-A-00-03-00003-00 and is implemented by the Carolina Population Center at the University of North Carolina in partnership with Constella Futures, John Snow, Inc., Macro International Inc., and Tulane University.

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Printed on recycled paper

This working paper series is made possible by support from the U.S. Agency for International Development (USAID) under Cooperative Agreement No. GPO-A-00-03-00003-00. The opinions expressed are those of the authors, and do not necessarily reflect the views of USAID or the U.S. government.

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Community and Health Facility Influences on Contraceptive Method Choice in the Eastern Cape, South Africa

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Acknowledgements: This research was funded by the MEASURE Evaluation Project, University of North Carolina at Chapel Hill, under the Secondary Analysis Funding Program.

Abstract

Although there have been a growing number of studies that examine how community factors influence contraceptive use, there is a lack of studies that examine how community factors shape contraceptive method choice. This paper uses linked individual and health facility data from the 1998 South Africa Demographic and Health Survey and the 1998 Eastern Cape Facility Survey to explore community and health facility influences on the choice of contraceptive methods other than the injection (the most commonly used method in South Africa). Several pathways of influence between the community and individual contraceptive method choice are identified. Health facility staffing levels and clinic preparedness are significant influences on contraceptive method choice. Other non-health facility related community factors that influence contraceptive method choice include the climate of female autonomy, levels of education, and community socio-economic status. The residual variation in contraceptive use highlights the deficits that exist in current data sets for capturing community influences on contraceptive behavior.

Introduction

South Africa's demographic transition is considerably more advanced than other sub-Saharan African nations. The Total Fertility Rate (TFR) declined from approximately 6.0 in 1980 to stand currently at 2.2 (South Africa Department of Health *et al.,* 2000; US Census Bureau 2007). This has been paralleled by increases in contraceptive use among all four major population groups (Whites, Indians/Asians, Coloreds, and Black Africans) (Burgard 2004; Swartz 2002). Although the national average rate of contraceptive use is 61% (66% urban and 53% rural), the average does not account for wide racial disparities or contraceptive method choice being dominated by injectable contraceptives (30% of all use) (Swartz 2002: South Africa Department of Health *et al.*, 2000). Previous studies of the determinants of contraceptive use in South Africa focused on individual and household level influences, and largely ignored the role of community and health care system factors (Maharaj and Cleland 2005; Burgard 2004; Myer *et al.*, 2002). In general, few studies examine the role of the community context in shaping contraceptive method choice. Although some studies have examined how communities shape contraceptive adoption (Stephenson *et al.*, 2007: Stephenson and Tsui 2002), they focused largely on the role of health service quality (Chen and Guilkey 2002). This paper uses data from the Eastern Cape, a province with poor economic and health indicators, to examine the roles that community and healthcare infrastructure characteristics have on a woman's contraceptive method choice. The papers aims to understand the community factors that shape the choice of contraceptive method, particularly those factors that influence the adoption of methods other than the injection (the most popular contraceptive method in South Africa). Understanding the pathways between community characteristics and

method choice will help develop community-based programs aimed at expanding the contraceptive method mix in South Africa.

Background

Recent years have seen a growth in the application of *social epidemiology*, an approach which emphasizes social conditions as fundamental causes of health and arises from an interest in understanding how individual health outcomes and behaviors are influenced by factors beyond the household-level (Link 1995; Halloran 1991; Koopman 1994; Grady *et al.*, 1993; Chacko 2001; Magadi *et al.*, 2000; Pebley *et al*., 1996; Von Korff *et al.*, 1992; Diez-Roux 2001; Stokols 1992). In a social epidemiology approach, social factors influencing health outcomes are the focus of analysis, and are not simply adjusted for or used as proxies for individual risk factors (Link 1995; Halloran 1991; Koopman 1994). This has been facilitated by the development of multilevel modeling techniques, which provide a robust method for analyzing hierarchically clustered data while allowing the measurement of the influence of community factors and unobserved community effects on health outcomes (Duncan *et al.*, 1998; Diez-Roux 2001; Goldstein 1995; DiPrete and Forrostal 1994). However, many studies of community-influences on health have focused attention on one aspect of the community environment or on characteristics of the healthcare infrastructure in isolation, and there is a dearth of studies that attempt simultaneously to quantify community social, economic, cultural, and healthcare influences on health behaviors.

There has been a recent growth in the number of studies that examine how community contextual factors influence contraceptive use (Stephenson and Tsui 2002:

Stephenson and Tsui 2003; Entwisle *et al.,* 1996; Grady *et al.,* 1993), however, attention to how community-level factors influence contraceptive method choice has been limited. At the community level, studies of contraceptive use have focused on the influence of health service characteristics, primarily the influence of quality of care on contraceptive adoption (Tuoane *et al.,* 2003; Bongaarts and Bruce 1995; Tsui and Ochoa 1992; Oliver 1995). Clear associations have been found between quality of care indicators, such as distance to service and provider attitudes, and contraceptive adoption (Hamid and Stephenson 2006; Katende *et al.,* 2003; RamaRao *et al.,* 2003; Seiber and Bertrand 2002; Magnani *et al.,* 1999; Steele *et al.,* 1999). In a cross country comparison of 15 countries, Blanc *et al.,* has shown that within a year of starting use of a method, between 7% and 27% of women cease to practice contraception for reasons related to the quality of the service environment (Blanc *et al.,* 2002). Additionally, the provision of a range of contraceptive methods at family planning services has been shown to influence contraceptive adoption (Hamid and Stephenson 2006; Steele *et al.,* 1999). However, there is less evidence for the roles of non-health facility community influences on contraceptive use. In a study of community influences on contraceptive use in the U.S., Grady *et al.,* (1993) found rapid population growth, high rates of unemployment, elevated levels of religious affiliation, higher socioeconomic status, and ready access to family planning services were all associated with increased uptake of contraception. Similarly, Degraff *et al.,* (1997) found the presence of family planning services and community-level labor-market conditions and infrastructural development are strong influences on contraceptive use in the Philippines. Some studies have examined other characteristics of the community, including the influence of levels of community economic development

(National Research Council 1993; Nazzar *et al.,* 1995; Diez-Roux 1998; Stephenson and Tsui 2002: Saha 1998), levels of school participation (DeGraff, *et al.,* 1997; Chacko 2001), economic roles of children (Entwisle, Casterline and Sayed 1989; Entwisle and Mason 1985), and community fertility norms (Bongaarts and Bruce 1995; Nazzar *et al.,* 1995; Nsemukila *et al.,* 1999) on contraceptive use. To date, few studies have examined how these community factors shape contraceptive method choice.

In terms of contraceptive method choice, previous studies have demonstrated that indicators of availability (e.g., distance to services or number of contraceptive methods available at a clinic) do not completely explain the contraceptive choices made by women. In a study of contraceptive choice in rural Thailand, Entwisle *et al.,* (1996) show the importance of social networks in shaping individual method choice, suggesting that method dominance within villages reflects a process in which women acquire knowledge from other contracepting women in the village, perpetuating the use of some methods within communities. Thus, the potential exists for community and health facility characteristics to influence the contraceptive choices made by women through the availability of services, the manner in which the services are presented, and the prevailing attitudes towards contraception that may be present in a community. However, an understanding of how community and health facility characteristics influence contraceptive method choice is missing from the literature. This paper explores a range of health facility and community influences on contraceptive method choice in Eastern Cape, South Africa, and examines the community factors that influence women to adopt contraceptive methods other than the injection. An understanding of community-level characteristics associated with contraceptive method choice will inform the development

of community-based family planning programs that aim to expand contraceptive method choice.

Study Setting

The third most populous province in South Africa, Eastern Cape is also the second poorest province, containing the country's highest unemployment rate of nearly 50% (Mahlalela *et al.,* 2001). Prior to 1994, Eastern Cape was divided into three regions — Cape Provincial Authority and two independent black homelands Ciskei and Transkei. Post-Apartheid, the governmental structures were divided into seven district councils (Mahlalela *et al.,* 2001). Eastern Cape experiences some of the worst health indicators in South Africa, falling below the national average in child mortality and childhood immunization. The Total Fertility Rate in Eastern Cape Province of 3.5, well above the national figure of 2.9, is paralleled by a relatively low modern contraceptive prevalence of 59% (South Africa Department of Health *et al.,* 2000). As in most of South Africa, the injection is the predominant contraceptive method used by women in Eastern Cape, with 37% of women aged 15-49 reporting use (South Africa Department of Health *et al.*, 2000). Eastern Cape has the lowest percentage of women who report receiving family planning messages in the print media (31% compared to 54% for South Africa), and the second lowest percentage of demand for family planning met (68.4% compared to 83.8% for South Africa) (South Africa Department of Health *et al.,* 2000). Family planning services are almost universally available at government clinics in Eastern Cape, and quality of care indicators, such as method availability and uninterrupted electricity supply, are higher than the national average (van Rensberg *et al.,* 2001; MEASURE

Evaluation and EQUITY Project 2004). In contrast, Eastern Cape government clinics have the lowest proportion of doctors in any province except Northern Province (van Rensberg *et al.*, 2001; MEASURE Evaluation and EQUITY Project 2004).

Data and Methods

Individual, household and community-level data for this analysis come from the 1998 South African Demographic and Health Survey (SADHS). The DHS uses a stratified multi-stage cluster sample design to collect a nationally representative sample of women of reproductive age (15-49). Questionnaires are conducted with all eligible women in each sampled household, collecting data on fertility, family planning, and child health, in addition to demographic and socioeconomic data. A full description of the study design can be found at http://www.measuredhs.com. The 1998 Eastern Cape Facility Survey (ECFS) collected information from 624 government clinics, which were selected on the basis of proximity to the Primary Sampling Units (PSUs) surveyed in the 1998 SADHS. PSUs are the enumeration blocks used in the sampling of the DHS and comprise twenty to thirty households. Detailed information was collected from interviews with nurses on staffing and recent staff training, supervision visits, availability of drugs, supplies and basic infrastructure, service availability, emergency services, transportation, and referrals. In terms of family planning services, information was collected on the number of family planning methods offered by the facility, whether each of the methods was in stock, and the training received by staff on family planning. The data from the 1998 ECFS was linked to the 1998 SADHS using the Global Positioning System coordinates for the facilities and households, such that each household was linked to the

closest government clinic. Using the geographical center of each of the 209 SADHS enumeration areas as the approximate location of household, the distance was calculated from the center of the enumeration area to the closest government clinics for which data were available from the 1998 ECFS and which had geographic coordinates from GIS data. Each enumeration area was linked in this manner to the five closet clinics (MEASURE Evaluation and EQUITY Project 2004). Overall, 174 of the 624 clinics were linked to SADHS PSUs, and the remaining clinics were located in areas that were not as proximate to the populations for which information was collected in the SADHS.

The 1998 SADHS collected a sample of 11,752 women aged 15-49, and the sample was restricted to women interviewed in the Eastern Cape Region (n=2756). Women who report they have never had sexual intercourse (351), are currently pregnant (100), are infecund (30), or are not currently using a method of contraception (1097) were excluded from the analysis, producing a sample of 1165 women aged 15-49.

The dependent variable for analysis is categorical and groups women as injection users (reference category), pill or condom users (other temporary methods), IUD, and female or male sterilization users (permanent methods). The 1998 SADHS data set has a hierarchical structure, with women nested within households and households within PSUs, thus violating the assumption of independence of ordinary logistic regression models. A multilevel modeling technique was employed to account for the hierarchical structure of the data and to facilitate the estimation of community (PSU) level influences on contraceptive method choice. The multilevel modeling strategy accommodates the hierarchical nature of the data and corrects the estimated standard errors to allow for clustering of observations within units (Goldstein 1995). Multilevel models allow the

identification of clustering in contraceptive method choice (also known as the random effect), providing a measure of the extent to which the odds of reporting the use of each contraceptive category vary between communities. The multilevel models also control for a range of individual, household, health facility, and community-level factors thought to influence the outcome. A multi-nomial multilevel model was fitted to the categorical outcome of contraceptive method choice, using the MLWiN software package (CMM 2007). The model is written as:

$$\log\left(\frac{\Pi_{ij}^{(s)}}{\Pi_{ij\ (t)}}\right) = \beta_0^{(s)} + \beta_1^{(s)}\chi_{ij} + \upsilon_j^s, s = 1,\ldots t-1$$

If γ_{ij} is the categorical response for woman *i* in district *j*, then the probability of being in category *s* is denoted by $\Pi_{ij}^{(s)}$, where $\upsilon_j^{(s)}$ is a community-level random effect assumed to be normally distributed with mean *0* and variance $\sigma_u^{2(s)}$. The random effects are contrast-specific, as indicated by the *s* subscript, because different unobserved community-factors may affect each contrast. Thus, the intra-community correlation in contraceptive use may vary by type of method. However, the random effects may be correlated across contrasts: $Cov\left(\upsilon_j^{(s)}, \upsilon_j^{(r)}\right) = \sigma_u^{(s,r)}, s \neq r$. Correlated random effects would thus arise if there were unobserved community-level factors that affected the choice of more than one method.

The variables to be entered into the model are grouped into individual, household, health facility, and community variables (Table 1). The choice of individual and household independent variables is informed by previous studies on the factors influencing contraceptive method choice. The choice of community and health facility

factors is informed by a review of literature on the dimensions of quality of care and community environments that have been shown to influence reproductive health behaviors. Table 1 shows all the health facility and community factors considered in the analysis, although only those that proved to be significantly associated with contraceptive method choice are presented in the final model (Table 2). In terms of health facility characteristics, the analysis considered distance to the facility, staffing levels, staff training in family planning and reproductive health, availability of family planning and reproductive health services, and the presence of family planning methods. For community-level factors, the analysis considered levels of male and female education, levels of employment, community-level indicators of female autonomy, levels of child mortality, prevailing demographic behaviors, and community knowledge of family planning. Community-level factors are derived from individual data by aggregating individual responses to the PSU level without the index response.

Results

There were distinct differences in the individual, household, health facility, and community-level factors that were significantly associated with the adoption of each of the contraceptive methods modeled (Table 3). Only one individual-level factor had a consistent relationship with contraceptive method adoption. Relative to Black African women, Colored and White women were significantly more likely to report using both the pill and a more permanent method of contraception (IUD or male or female sterilization) than the injection. Women who reporting working outside the home had a significantly higher likelihood of using the pill than the injection, but there was no effect

of employment status on the choice of a more permanent method of contraception over the injection. Women residing in urban areas were less likely to be using the pill than the injection, but were significantly more likely to be using a more permanent contraceptive method than the injection. Women with more than five children were more likely than women with no children to be using a more permanent method of contraception than the injection. There was no significant relationship between parity and the choice of the pill over the injection. Relative to women aged 40-49, women aged 15-34 were significantly less likely to be using a more permanent method of contraception than the injection. There was no significant relationship between age and the choice of the pill over the injection. Women living in wealthier households were more likely to be using a more permanent method of contraception than the injection.

At the community-level, women living in communities where a large percentage of women controlled their own earnings were more likely to be using both the pill and more permanent methods of contraception than the injection. Higher mean age of first sexual intercourse among women in the community was associated with a significantly increased likelihood of using the pill over the injection, but had no influence on the adoption of permanent methods. Women residing in communities with a higher mean spousal age difference were more likely to be using a permanent method of contraception over the injection. Women living in communities in which a higher percentage of women had only primary education were less likely to be using the pill than the injection. Residency in a community with a higher mean score on the household asset index was also associated with a significantly increased likelihood of using the pill or a more permanent method of contraception over the injection.

At the health facility-level, women who lived in communities in which there was a higher number of doctors present at health facilities were more likely to be using both the pill and more permanent methods of contraception than the injection. The number of community workers in a community significantly reduced a woman's likelihood of using the pill over the injection, but had no affect on the adoption of more permanent contraceptive methods. The number of nurses at the health facility who had received training on HIV/AIDS reduced the likelihood of a woman choosing the pill over the injection. Women who lived in communities in which the health facility had more expired contraceptive methods in stock were more likely to be using a permanent method of contraception than the injection. Similarly, women in communities in which the health facility scored higher on the facility assets index were more likely to be using a permanent method of contraception than the injection.

The community-level random intercept term remained significant for all categories after the inclusion of the individual, household, health facility, and community variables in the model. Thus, there remains significant community-level variation in contraceptive method choice in the Eastern Cape above and beyond the variables already accounted for in the model.

Discussion

The results highlight several community factors that are associated with contraceptive method choice in this setting. Women living in communities that were wealthier and had higher levels of female autonomy (as indicated by control over earnings) were more likely to be using either the pill or a more permanent method of

contraception than the injection. Similarly, women in communities with higher levels of education and higher mean ages at first sex (indicative of higher levels of female autonomy) were more likely to be using the pill than the injection. The results suggest a profile of communities in which the uses of injectable contraceptives dominate — communities that are characterized by poorer socio-economic environments and environments of low female autonomy lacking in social and economic opportunities for women. Previous studies have highlighted wide racial disparities in contraceptive use in South Africa. Although Black Africans account for 77% of the population, 61% exist in poverty and the 58% contraceptive prevalence is lower than that found in other groups (80% of Whites, 76% of Indians/Asians, and 69% of Coloreds) (Swartz 2002). Choice of contraceptive method follows racial stratification (Swartz 2002). Whites, who rely less on public family planning services, utilize a wider range of modern contraceptive methods (Swartz 2002: South Africa Department of Health *et al.*, 2000). The Black African and Colored populations rely heavily on contraceptive injections (accounting for 35% and 27% of use among these populations respectively). The disparities that exist in method choice across racial groups may be the product of inequitable access to knowledge and services, or to individual preferences that predominate among some population groups. The analysis sample is comprised predominantly of Black Africans (85.7%), thus the results may be reflecting the concentration of injection use in poorer Black African communities in the Eastern Cape. Variations in contraceptive choice seem to be present only in those communities with greater levels of socio-economic development.

The concentration of injection use in poorer Black African communities may reflect the targeting of family planning efforts towards areas with the greatest demand.

The potential biasing effect of the non-random placement of health services has been highlighted in studies that have examined the impact of public health interventions on individual health outcomes (Angeles *et al.*, 1998; Gertler and Molyneaux 1994; Pitt *et al.*, 1993). Gertler and Molyneaux (1994) note panel data can control for the non-random placement of services of program inputs by measuring the multivariate correlations between changes in the health outcomes and the explanatory variables. However, as is the case with the 1998 SADHS, most commonly available data sources for the study of the determinants of contraceptive use in less-developed nations are cross-sectional in nature.

Health facility characteristics that were associated with method choice indicate a relationship between quality of health facilities and method choice. More doctors present at health facilities increased the use of both the pill and more permanent methods of contraception, suggesting that health facilities with higher staffing levels may be more equipped to counsel on and provide a greater range of contraceptive methods. Women residing in communities in which the health facility scored high on the facility asset index were more likely to be using a permanent method of contraception, suggesting a relationship between facility preparedness and the ability to offer a range of contraceptive methods. The presence of more community health workers in a community significantly reduced the adoption of the pill over the injection. In terms of method delivery, the pill and the injection are both easily provided in a home setting by community health workers. Thus, there may be a preference among community health workers for the provision of injectable contraceptives.

The community and health facility variables included in the analysis do not fully explain community-level variation in the decision to adopt a contraceptive method other

than the injection. The presence of community residual variation in contraceptive method choice may reflect the absence of variables that are either not commonly collected in community surveys or less tangible factors that are difficult to quantify in surveys. The latter may include the presence of social networks within communities that act as vehicles for the transmission of contraceptive knowledge. Social networks provide women with access to information on contraception, and methods may become popular in communities through the transmission of positive experiences from early adopters (Entwisle *et al.,* 1996). The residual variation in contraceptive method choice observed here may be reflecting the absence of social network data in the SADHS (1998) data. The residual variation in contraceptive method choice may also reflect the lack of data that captures structural elements of the community environment. Community-level factors such as the presence of employment opportunities or institutions that facilitate social interactions may influence contraceptive method choice by providing access to economic and social resources. Additionally, beliefs surrounding particular contraceptive methods that prevail within a community may be a strong influence on a woman's choice of contraceptive. Yet, such forces are hard to measure in a large social survey and are absent from the current data.

There are several limitations to this study. First, there is a lack of non-health facility data collected directly at the community-level, resulting in the reliance on community indicators derived from individual responses. While this has proven to be an effective proxy for community data (Blakely and Woodward 2000), the continued presence of community-level variation in contraceptive method choice demonstrates the need to collect data that directly measures some of the community forces on

contraceptive behavior. Second, the health facility data was collected for government health facilities only. The private sector serves approximately 15% of family planning users in South Africa, with higher levels of private sector utilization among the White and Asian populations (Swartz 2002). Gready *et al.,* (1997) found that many South African women reported negative experiences of government operated family planning services, and had greater confidence in services offered by the private sector. Thus, the data are not capturing the complete service environment in the community, and it may be possible to explain more of the variation in contraceptive use with data representative of all family planning service providers.

Conclusion

This study has provided an important step towards understanding the numerous ways in which the contraceptive method choice is influenced by community characteristics, and has also provided new information on the synergistic effects of the community and health facility environments on contraceptive choice. However, significant community variation in contraceptive method choice remains, highlighting the need for focused attention on the collection of community-level data on the structural, behavioral, and cultural dimensions of community environments. From a methodological perspective, more emphasis needs to be placed on the collection of community level data that can reduce unexplained variations in contraceptive behavior. Also a longitudinal approach needs to be adopted to allow the disentangling of the effect of program targeting on contraceptive method choice. From a program perspective, community-level family planning focused interventions should be aimed at the structural elements of

communities that currently shape contraceptive behavior. In particular, there are clear community and health facility characteristics that are associated with the decision to adopt a method other than the injection. The results point to the need to focus attention on expanding contraceptive method uptake and availability among poorer, predominantly Black African communities in the Eastern Cape, and the need to encourage the uptake of other contraceptive methods that is observed in communities with indicators of greater socio-economic development.

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Table 1. Individual, Household, Community, and Health Facility Variables Considered in the Analysis of Contraceptive Method Choice

Characteristic	Operational Definition
Individual	
Woman's Age	Self-reported age in years: 15-19, 20-24, 25-29, 30-34, 35-39, 40-49
Parity	Self-reported number of children ever born: none, 1-2, 3-4, 5+
Place of residence	Place of residence at time of interview: urban or rural
Woman's educational attainment	Self-reported highest level of education achieved: none, primary, secondary, higher
Race	Self-reported race: White, Black African, Asian/ Indian, Colored
Employment status	Respondent reports working outside the home: yes or no
Marital status	Self-reported marital status at time of interview: single, married, cohabiting, widowed or divorced, or in a non-cohabiting union
Spousal age difference	Calculated from respondent's reporting of her own and her husband's ages
Exposure to HIV/AIDS information	A summative index of the number of sources from which the respondent reports she has heard of HIV/AIDS; radio, television, newspaper, pamphlet/poster, clinic, friends, partner, or relative (range 0-8)
Age at first intercourse	Respondent's report of the age in years at which she first had intercourse: <15, 16-20, 21+
Physical violence from partner	Respondent's report of whether she experienced physical violence from her partner in the 12 months prior to the survey
Household	
Household size	Self-reported number of people living in the household at the time of the interview
Asset score	Summative index of ownership of household goods: piped water, electricity, flush toilet, radio, television, refrigerator, bicycle, motorcycle, car, formal floor material (vinyl, carpet, tile, concrete or wood), formal wall material (cement, corrugated iron/ zinc, brick); range 0-11
Community	
Asset score	Mean asset score for all household in the PSU
Spousal age difference	Mean spousal age difference for all respondents in the PSU
Female primary education	Percentage of women in the community with only primary education
Female employment	Percentage of women in the PSU who report working outside of the home
Control of earnings	Percentage of women in the PSU who report controlling their earnings
Age at marriage	Mean age at marriage for women in the PSU

Physical partner violence	Percentage of women in the PSU who report experiencing physical violence from their partners in the 12 months prior to the survey
Female approval of family planning	Percentage of women in the PSU who report that they approve of family planning
Male approval of family planning	Percentage of men in the PSU who report that they approve of family planning
Age at first sex	Mean age at first sex for women in the PSU
Female knowledge of family planning	Summative index of number of sources from which women in the PSU report that they have heard of family planning; television, radio, print media, friends, health workers
Child deaths	Proportion of births in the PSU in the 3 years prior to the survey that resulted in infant or child death
Health Facility	
Distance to service	Distance in kilometers to the nearest government health facility
Presence of Doctors	Number of part-time and full-time doctors at the health facility
Presence of nurses	Number of part-time and full-time nurses at the health facility
Nurse posts filled	The proportion of nurse posts that are currently filled at the health facility
Presence of community health workers	The number of community health workers that are currently working in the community
PHC training	The number of nurses with more than 6 months training in primary health care
Family Planning training	The number of nurses who have received training in family planning in the 12 months prior to the survey
HIV/AIDS training	The number of nurses who have received training in HIV/AIDS in the 12 months prior to the survey
Number of contraceptive methods available	The number of contraceptive methods in-stock at the time of the survey
Expired contraceptive methods	The number of methods of contraception available at the health facility that have expired
Other reproductive health services	The number of reproductive health services offered at the clinic: pre-natal, post-natal and delivery care, STD and HIV diagnosis and counseling
Facility Assets	A summative index measuring the infrastructural capacity of the health facility: condoms available in reception, map of catchment area on display, adult scale, infant scale, telephone, fax machine, two-way radio, refrigerator, stethoscope, sphygmomanometer: range 0-10
Drugs available	Health facility has 14 commonly used drugs available: range 0-14

Table 2. Distribution of Individual, Household, Community, and Health Facility Variables Significant in Model of Contraceptive Method Choice

Characteristic	Percentage	Mean (range)
Individual		
Contraceptive Method		
Injection	68.6	
Pill	14.6	
IUD, Male or female sterilization	16.8	
Woman's Age		
15-19	17.1	
20-24	20.0	
25-29	17.1	
30-34	14.6	
35-39	15.0	
40-49	16.2	
Place of residence		
Urban	48.6	
Rural	51.4	
Race		
Black African	85.7	
Colored/ Asian	8.9	
White	5.4	
Parity		
None	24.4	
1-2	23.2	
3-4	31.9	
5+	20.5	
Employment status		
Not working	73.4	
Currently employed	26.6	
Household		
Asset score		4.2 (0, 11)
Community		
Percentage of women who control their earnings		3.2 (0, 100)
Mean age at first sex for women		16.1 (11.6-22.3)
Mean spousal age difference		2.32 (0-12.1)
Percentage of women with only primary education		29.6 (0-100)
Mean asset score for households in the community		4.17 (0-11)
Health Facility		
Number of doctors present at health facilities		0.3 (0, 4)
Number of community health workers in PSU		30.1 (0, 301)

Number of nurses with training in HIV/AIDS in the last 12 months		1.3 (0-16)
Number of contraceptive methods in stock that have expired		0.3 (0-2)
Facility Asset Score		7.3 (2-10)

Table 3. Multilevel Multinomial Model of Contraceptive Method Choice among Sexually Active Women 15-49 in Eastern Cape Province, South Africa; Numbers shown are Relative Risk Ratios and 95% Confidence Intervals

	Pill v Injection	IUD, Female or Male Sterilization v Injection
Individual		
Woman's age (40-49)		
15-19	0.72 (0.35, 1.46)	*0.04 (0.01, 0.06)*
20-24	0.69 (0.35, 1.38)	*0.04 (0.01, 0.06)*
25-29	0.79 (0.39, 1.60)	*0.05 (0.01, 0.07)*
30-34	0.96 (0.47, 1.97)	*0.18 (0.10, 0.32)*
35-39	0.98 (0.46, 2.07)	0.70 (0.42, 1.14)
Place of residence (Rural)	*0.51 (0.32, 0.81)*	*1.41 (1.04, 2.83)*
Urban		
Race (Black)	*2.18 (1.20, 3.97)*	*2.64 (1.43, 4.89)*
Colored	*5.98 (1.62, 9.52)*	*5.96 (3.03, 8.14)*
White		
Parity (None)	0.54 (0.33, 0.89)	0.87 (0.26, 2.92)
1-2	0.56 (0.31, 1.01)	1.92 (0.63, 5.84)
3-4	0.53 (0.25, 1.13)	*3.19 (1.05, 6.12)*
5+		
Employment status (Not working)	*2.53 (1.65, 3.87)*	1.22 (0.80, 1.87)
Currently employed		
Household	0.94 (0.86, 1.03)	*0.90 (0.80, 0.99)*
Asset Score		
Community		
Percentage of women in the PSU who control their own earnings	*3.16 (1.84, 5.14)*	*2.78 (1.68, 4.61)*
Mean age at first sexual intercourse for women in the PSU	*1.26 (1.12, 1.41)*	1.09 (0.98, 1.20)
Mean spousal age difference in the PSU	1.04 (0.95, 1.15)	*1.18 (1.08, 1.29)*
Percentage of women with only primary education	*0.14 (0.05, 0.38)*	0.91 (0.38, 2.20)
Mean household asset score in the community	*1.06 (1.03, 1.11)*	*1.11 (1.02, 1.21)*
Health Facility		
Number of doctors present at health facilities	*1.48 (1.19, 1.85)*	*1.38 (1.12, 1.69)*
Number of community health workers	*0.89 (0.79, 0.99)*	0.99 (0.98, 1.02)
Number of nurses with training in HIV/AIDS in the last 12 months	*0.91 (0.83, 0.99)*	0.97 (0.90, 1.04)

Number of contraceptive methods in stock that have expired	0.78 (0.28, 2.12)	*2.08 (1.03, 4.46)*
Facility Asset Score	1.11 (0.99, 1.24)	*1.15 (1.03, 1.29)*
Community-level random intercept	*2.035 (0.200)*	*3.432 (0.321)*

Figures in italics are significant at P<0.05