

Patterns of Contraceptive Use at the Edge of Fertility Transition in Zimbabwe

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Abstract

The family planning program in Zimbabwe has been seen as one of the successful models in Sub-Saharan Africa. The program has largely depended on community-based distributors (CBDs) of contraceptives in rural areas and the utilization of stationary facilities in urban areas. The paper examines how the service availability environment has affected contraceptive use among different groups of women. The study uses multilevel models to examine the relationship between service factors and contraceptive use. The most important finding is that in clusters where CBDs operate, women are more likely to use modern contraceptives. Most of the women in rural areas depend on CBDs for their contraceptive supplies, while those in urban areas get their supplies from stationary facilities, that is clinics and pharmacies. The study has also demonstrated the need to sustain the current outreach program in rural areas because a large proportion of the women in rural areas, commercial farms, small towns and resettlement areas depends on contraceptives being distributed to their doorsteps.

Résumé

Le programme de planning familial du Zimbabwe a été considéré comme un des modèles réussis en Afrique sub-Saharienne. Le programme s'était fortement appuyé sur les distributeurs de contraceptifs au niveau des communautés dans les zones rurales et sur l'utilisation de structures fixes dans les villes. Cet article étudie l'impact d'un environnement offrant ces services sur l'utilisation de la contraception par divers groupes de femmes. L'étude utilise les modèles multi-variés pour analyser les rapports entre les facteurs de service et l'utilisation de la contraception. Les résultats obtenus montrent que là où les distributeurs existent, les femmes utilisent plus probablement les contraceptifs. Dans les zones rurales, la plupart des femmes comptent sur les distributeurs pour s'approvisionner en contraceptifs alors que dans les villes, les femmes se ravitaillent dans des structures fixes tels que les cliniques et les pharmacies. L'étude a montré qu'il était nécessaire de poursuivre l'actuel programme de sensibilisation dans les zones rurales car la plupart des femmes de ces zones, des fermes commerciales, des petites villes et des zones de recasement comptent sur ces contraceptifs distribués de portes à portes.

Introduction

Contraception is defined as the practice of methods of preventing or planning conception. Contraceptive methods can be divided into two categories: traditional and modern. Modern contraceptives are easily classifiable and include oral contraceptives, intrauterine devices (IUDs), female and male sterilisation, injections, condoms and the diaphragm. Other practices, which have a direct impact on fertility, have been used. These include prolonged breastfeeding and postpartum sexual abstinence, which are probably used by mothers more for recuperating between births, child survival and child spacing

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rather than for limiting family size. Thus, these methods have not been considered as contraceptive methods although their fertility inhibiting characteristics are well recognised. The use of modern and traditional methods varies by country and societal norms and access to modern contraceptives mainly determine this.

Some factors which have been found to have a positive effect on contraceptive use include the role of the electronic and print media, education and programme intervention. These hypothesised effects have been outlined by Shevasunt and Hogan (1979):

As a theoretical perspective, family planning knowledge is assumed to increase favourable attitudes towards family planning. Both family planning knowledge and favourable attitudes are hypothesised to increase the rate of contraceptive use among women who wish to limit their fertility. Social legitimisation of family planning in the form of positive attitudes held by the husband and by the community provides a favourable climate for the practice of contraception, increasing the rates of use. Better educated women and women working in non-farm jobs are hypothesised to have higher rates of contraceptive use, in large part as a result of their better understanding about reliable methods of family planning. Program intervention in the family planning decision-making process is viewed as being successful to the extent that it directly increases rates of family planning practice by increasing knowledge about and favourable attitudes towards contraception among people at each level of socio-economic development.

In theory, the association between contraceptive use and fertility level shows a negative relationship. Mauldin and Segal (1986) show that as contraceptive prevalence increases, the crude birth rate decreases. However, this relationship has a threshold as Mauldin and Segal (1986) note that this relationship becomes unstable when the crude birth rate falls below 20 ‰ because of changing age structure, delayed age at marriage and increased relative importance of abortion. Contraceptive use can be used as a proxy for the level of fertility as this is based on the high degree of correlation between the fertility rate and contraceptive prevalence rate. Bongaarts and Potter (1983) estimate this relationship using the regression equation:

$$\begin{aligned} \text{TFR} &= 7.3 - 6.4 \times \mu \\ &= 7.3 \times (1 - 0.88 \times \mu) \quad R^2 = 0.72 \end{aligned}$$

The regression equation gives the proportional reduction in the TFR associated with an increase in contraceptive use, μ . The intercept of 7.3 represent the expected fertility in the absence of contraception and 6.4 is the slope which gives the estimate in decline associated with increase in μ , and the relative slope equal to 0.88 gives the proportional decline. Some other regression equations have been used and a strong negative relationship has been found (Nortman

1982; United Nations, 1989; Frank and Bongaarts, 1991). However, this relationship has been found to be weaker in Sub-saharan Africa due to a variety of reasons. First, in Sub-saharan Africa, a substantial proportion of contraceptive use consists of traditional methods which are inefficient and are likely to have a marginal effect on fertility. Second, a lag-effect exists which is introduced by the fact that the contraceptive prevalence rate in any survey would be a current measure, which would not have had time to impact on fertility. Thirdly, the contraceptive prevalence rate is not an effective measure in cases where contraception has been used for short durations or is being used inefficiently.

One of the main objectives outlined by Zimbabwe National Family Planning Council and Ministry of Health is for the widespread adoption of contraception that allows women and couples to control their childbearing and achieve a family size commensurate with their resources and energies. If such an objective has to be realised at the micro-or individual level, then this would be reflected by use of contraception among all population subgroups. At the macro-level, the widespread adoption of contraception is supposed to have an impact on population growth by reducing the fertility level.

Theoretical Framework

The theoretical framework which forms the basis of this analysis is an integration of the intermediate determinants framework proposed by Davis and Blake (1956) and the fertility decision-making model presented by Bulatao and Lee (1983). The Davis-Blake model starts from the premise that reproduction involves three necessary steps: intercourse, conception and completion of gestation. The fertility decision-making theory is based on the notion that as society modernises, changes occur including rational decision-making and changes on the structure of the family. According to Silva (1990):

Parallel to this revolution in fertility levels, an equally significant transformation occurs in the mechanisms, which makes fertility choices possible. This process is conceived as a shift from a situation where fertility is exerted through biological and social mechanisms-sexual taboos for instance-to another in which fertility control results from deliberate decisions on the part of individuals.

The integration of the two approaches supposes that decisions have a direct input in altering the intermediate variables. While it might not be possible to include all the variables and pathways in any one model, it provides a useful start point and guide in selecting the variables which have a direct influence on contraceptive use. In the framework, the proportion of current contraceptive users in a population is a product of new users (adoption), continuing users (continuation) and those who have resumed use (resumption). These can be used to distinguish preadoption and post-adoption stages of contraceptive use. These stages are themselves influenced by socio-economic, cultural and macro factors. Contraceptive use is determined by motivation to regulate fertility, the costs of fertility regulation and programmatic aspects.

Decision-making consists of three elements: knowledge, motivation and assessment of fertility regulation. The initial step involves being aware of the alternatives of influencing one's costs of reproductive behaviour. According to Sheldin and Hollerbach (1981) couples should perceive alternatives to pregnancy and procreation in order for them to wield upon them. However, knowledge alone would not be sufficient to influence fertility regulation although it is a necessary precondition. Knowledge about contraceptives should be accompanied by perceptions about access and availability of methods in order for proper considerations to be given whether to use or not. In order for women to adopt contraception, they should have a perception on the availability and accessibility of the means of fertility regulation, so that they can translate these perceptions into action.

The second stage of the decision-making process involves motivation. Within a population, motivation is influenced by socio-economic, cultural and family life cycle patterns. The concept of motivation has been used widely in the economic models of fertility (Easterlin and Crimmins, 1982, 1985). Easterlin's synthesis framework defines motivation as the balance between supply and demand ($C_n - C_d$) where:

C_n is potential family size, that is, the number of surviving children a couple would have if fertility was not deliberately controlled.

C_d is desired family size, that is, the number of children wanted by a couple given taste considerations and price and income constraints.

While the above explanation relies heavily on economic theory, it would be sufficient to say that motivation is closely related to reproductive ideals and preferences, which are influenced by the advantages and disadvantages of a large family. These reproductive ideals and preferences are continually reviewed and modified by the family and couple's circumstances throughout the reproductive life span.

The last stage in the decision-making process is assessment, which is the weighing of positives and negatives of adopting contraception. Using Easterlin's economic model again, this is equivalent to the variable costs of fertility regulation which refers to two different types of costs: psychic costs (attitudes and feelings about fertility regulation) and market costs (time and money in learning and using fertility control). If the costs are high, this might result in refusal to adopt the method. Other factors included in the assessment are side effects (perceived or real), availability of services and social norms.

An important consideration is the role of the availability of family planning services in influencing fertility decline. Conventional demographic theory proposes that contraceptive availability accelerates fertility decline already underway and in situations where there is latent demand. The hypothesis to be tested is that contraceptive use is related to the density of static family planning facilities, density of outreach services and overall availability of family planning

services within clusters, or travel times or distance to services.

Determinants of Contraceptive Use: Multivariate Analysis

Contraceptive use is modelled as a prevalence rate, that is, the proportion of current users to all women in sample who are sexually active. Multivariate analysis in this section utilises data from the 1988 and 1994 ZDHS. Using data from both the service availability and individual woman modules, an examination of the relative influence of individual and community factors in determining contraceptive use is made.

The analysis uses a multilevel logistic regression to estimate the effects of individual and community level factors in influencing contraceptive use. The estimating equation is given by:

$$\ln\left(\frac{p_{ijk}}{1-p_{ijk}}\right) = X_{ijk}\beta + W_{jk}\gamma + Z_k\eta + \mu_{jk} + \nu_j$$

where p_{ijk} is the probability that a woman i in the j^{th} cluster and k^{th} province is using contraception at the time of the survey. The terms X_{ijk} , W_{jk} and Z_k are vectors of individual, cluster and provincial-level characteristics, respectively and the terms β , γ and η are the vectors of estimated parameter coefficients. The cluster and provincial-level error terms are represented by $\mu_{jk}(\sim N(0, \sigma_u^2))$ and $\nu_j(\sim N(0, \sigma_v^2))$, respectively. In multilevel modelling, there are options for choosing a nonlinear link function for a model with a response variable with a binary outcome. In this analysis the logit function represented by $\log\{p/(1-p)\}$ is used. The proportion is assumed to have a binomial distribution represented as $y_{ij} \sim \text{Bin}(p_{ijk}, n_{ijk})$ with variance: $\text{var}(y_{ij}/p_{ijk}) = p_{ijk}(1-p_{ijk})/p_{ijk}$. In the above, p_{ijk} is the expected value of the response in the ijk^{th} level. To improve the estimates obtained from the equations, which is the prediction of p_{ijk} , the recommendation by Goldstein and Rasbash (1995) is followed of using the Taylor expansion about the current estimated residuals, or posterior means, that is conditioning on these for each level 2 and higher units and is referred to as penalised or predictive quasilielihood (PQL).

In developing the model to explain contraceptive use, both supply and demand factors are taken into account. The variables chosen as measuring demand and supply factors are listed below.

Demand Factors Reflecting Motivation to Use

- a. *Demographic variables*: represented by age and marital status. The effect of age on contraceptive use may work through several channels. For example, the higher the age, the more contraceptive experience she is likely to have through learning from her own or her spouse's experience. Alternatively, young women may have access to and information about methods of contraception. Marital status is included as a measure of sexual exposure or that married couples are more likely to

communicate better, which can indirectly reflect spousal communication.

- b. *Reproductive history*: measured by children ever born. The effect of parity would be to increase use for high parity women.
- c. *Benefits of contraception*: measured by household consumption, education and work status of the woman. It is hypothesised that the relationship between education and contraceptive use is positive since educated women have more information about and greater access to contraceptive methods and they have more favourable attitudes towards fertility regulation, *inter alia* because education improves communication between husband and wife.
- d. Family life values : measured by female autonomy, which has been constructed from the ability of the woman to make independent decisions on household expenditure and family size.
- e. Exposure to family planning messages : measured by access to Information, Education and Communication campaigns. Also, exposure to both the print and electronic media are included in this category.

Factors Affecting Cost of Contraceptive Use

- a. *Economic costs* : measured by access and time to supply, the availability of a community-based distributor or mobile clinics and the economic circumstances of the household.
- b. *Normative costs* : measured by access to print and electronic media
- c. *Social costs* : measured by woman's decision-making role in fertility and use of household income.

In developing the model to explain contraceptive use, important statistical considerations have to be taken into account. An efficient way to estimate the model would be to use structural equations which would cater for the different pathways, thereby including both endogenous and exogenous factors which influence contraceptive use. This would entail using specialised software, for example LISREL that would provide an elaborate expression of the model in terms of latent variables and multiple indicators. However, the models have been fitted as a reduced-form model and this is statistically adequate since the ZDHS collected information, which can be used to satisfactorily measure individual, household, and community characteristics. In order to avoid estimation bias, endogenous variables are excluded from the reduced-form model. So, contraceptive use is regressed directly against the exogenous variables, and the parameters implied by the model reflect the net impact of individual, household, community characteristics and service availability on contraceptive use.

The results of fitting the above models are presented in Table 1 and the relative odds (exponentiated coefficients) of using contraception are shown for

each variable. The odds ratios presented in Table 1 show the contribution of each variable to predicting contraceptive use after controlling for other variables. An important consideration to be included is whether service availability factors and investments, which have been made in social and health services, have benefited all the population subgroups in the country. This is examined in terms of differentials in programme impact across residential strata and different cohorts of women. The models are fitted in three stages. First, micro-data from the ZDHS individual and household files are used to examine the effect of these variables on contraceptive use. The second stage involves adding community level variables, which will facilitate the analysis of the impact of the developmental process in variation in contraceptive use. Third, service availability factors are included in the models.

Table 1 : Odds Ratios for the Three-Level Logistic Regression Model for Current Contraceptive Use among Sexually-Active Women.

Variable	Rural		Urban		All Areas	
	1988	1994	1988	1994	1988	1994
Current age						
15-24	1.10	0.92	0.95	1.08	1.02	0.98
25-34 (Reference)	1.00	1.00	1.00	1.00	1.00	1.00
35-39	0.37***	0.51**	0.56***	0.53***	0.43***	0.53***
Woman's educational level						
None	0.66***	0.63***	0.70	0.85	0.66***	0.65***
Primary (Reference)	1.00	1.00	1.00	1.00	1.00	1.00
Secondary or higher	1.70***	1.60***	1.26	1.44**	1.52***	1.54***
Woman's work status						
None (Reference)	1.00	1.00	1.00	1.00	1.00	1.00
Working	0.96	1.40***	0.75	1.23	0.92	1.34***
Marital status						
Not married (Referen.)	1.00	1.00	1.00	1.00	1.00	1.00
Currently married	1.67***	2.19***	1.84***	1.82***	1.75***	2.04***
Parity						
0-2	0.37***	0.52***	0.53***	0.38***	0.43***	0.47***
3-5 (Reference)	1.00	1.00	1.00	1.00	1.00	1.00
6+	1.41***	1.55***	1.20	1.01	1.33**	1.39***
Female Autonomy						
Independent decisions	1.21	1.28***	1.05	1.02	1.22	1.19***
Somebody else decides (Reference)	1.00	1.00	1.00	1.00	1.00	1.00
Household Consumption Scale						
Low	1.00	1.00	1.00	1.00	1.00	1.00
High	4.40***	1.34	1.41**	1.19	1.84***	1.16
Exposure to Media						
No (Reference)	1.00	1.00	1.00	1.00	1.00	1.00
Yes	1.14	1.30***	1.82***	1.04	1.34***	1.25***

Stratum of Residence						
Communal (Reference)	1.00	1.00	-	-	1.00	1.00
Urban	-	-	-	-	1.27	1.33***
Commercial farming areas	1.15	1.38**	-	-	1.24	1.88***
Educational Opportunities						
Within 5 km (Reference)	1.02	1.06	0.85	0.82	0.97	1.06
More than 5 km	1.00	1.00	1.00	1.00	1.00	1.00
Transport System in Cluster						
Dry weather road	0.92	0.95	-	-	0.91	0.94
All weather road	1.00	1.00	-	-	1.00	1.00
CBD in Cluster						
No CBD Visits (Reference)	1.00	1.00	1.00	1.00	1.00	1.00
CBD available	1.19	1.37***	1.22	0.85	1.24**	1.18**
IEC/Mobile Clinic in Cluster						
Not Available	1.00	1.00	1.00	1.00	1.00	1.00
Available	0.99	0.91	1.14	0.95	1.01	0.94
Access to Family Planning Hospital						
Motorised <=10km	1.00	1.00	1.00	1.00	1.00	1.00
Motorised >10km	0.70	1.18	0.88	1.11	0.80	1.30
Walking/Other <=10km	0.46	0.84	0.82	1.32*	0.60	1.15
Walking/Other >10 km	0.67	1.14	1.35	1.24	0.82	1.30
Access to Family Planning Clinic						
Motorised <=10km	1.00	1.00	1.00	1.00	1.00	1.00
Motorised >10km	1.40	0.96	1.29	0.67	1.55*	0.93
Walking/Other <=10km	1.03	0.89	1.13	0.76	1.12	0.84
Walking/Other >10 km	1.19	1.05	1.00	1.36	1.28*	1.01
Availability of Pharmacy in Cluster						
Available	1.48	1.20	1.44**	1.31	1.32*	1.18
Not available	1.00	1.00	1.00	1.00	1.00	1.00
Availability of Private Doctor						
Not available	1.00	1.00	1.00	1.00	1.00	1.00
Available	1.53	0.89	0.88	0.79	1.15	0.87
Random Effects						
Cluster-level variance	0.11	0.11	0.00	0.04	0.07	0.08
	(0.06)	(0.06)	(0.00)	(0.04)	(0.04)	(0.04)
Provincial-level variance	0.00	0.04	0.00	0.02	0.00	0.05
	(0.00)	(0.03)	(0.00)	(0.04)	(0.00)	(0.02)

*** Significant at 1% ** Significant at 5% * Significant at 10%.

This applies to all subsequent tables

The likelihood ratio statistics for each model are presented below:

	Urban 1988	Urban 1994	Rural 1988	Rural 1994	Total 1988	Total 1994
Model 1	1462.04	1863.27	2845.60	4557.04	4314.07	6439.40
Model 2	1460.06	1860.99	2830.72	4555.73	4301.63	6427.31
Model 3	1440.26	1850.88	2798.46	4532.17	4278.02	6410.49

Although the table above presents the results for the full model, likelihood ratio statistics were estimated for each set of variables as follows:

Model 1 : Cons + Individual Characteristics + Household Characteristics

Model 2 : Cons + Individual + Household Characteristics + Community Characteristics

Model 3 : Cons + Individual + Household Characteristics + Community Characteristics + Service Availability.

Individual and Household Characteristics

The results in the last two columns of Table 1 show the effects of various covariates on the total sample of sexually active women. The effects of age on contraceptive use show significant differences between middle-aged and old women. The results show that women aged 15-24 have no significant differences in probabilities of using contraception when compared to those aged 25-34. The patterns by age for both surveys are consistent. In both surveys, old women are less likely to use any form of contraception and the results are significant at 1%. Low usage at old ages can be attributed to lack of exposure or early onset of permanent sterility and hence these women will no longer have any need for contraception or this could be a cohort effect.

Woman's education is an important determinant of contraceptive use. Significant differences can be observed among women of all educational categories when considering the whole sample. Woman's work status show that women who are not working are less likely to adopt contraception compared to those doing some form of economic activity for all sexually-active women. However, the 1988 data does not show significant differences.

The two demographic variables included in the model, parity and marital status show significant results. Currently married women are more likely to use contraception than their unmarried counterparts. Women with less than two children are less likely to use contraception than those with 3 to 5 children. High parity women are more likely to use contraception than middle parity women.

Household characteristics (female autonomy, household assets, exposure to

print and electronic media) present results which are not very consistent over the two surveys, but there are some significant results which are worth pointing out. Women who are likely to use contraception are from high or middle social class, those who are exposed to media and those who can make some independent decisions about household income and fertility. The influence of both the electronic and print media on contraceptive use is remarkable in Zimbabwe, where women who are exposed to the media are likely to use contraception.

The cluster-level and provincial level variances in Table 1 are interpreted as the unexplained cluster or provincial variation after controlling for the effects of other variables specified in the model. Neither the cluster nor the provincial level variances for the total sample in 1988 are significant, indicating the inclusion of most variables, which would explain cluster and provincial variation. However, the random part of the model for the total sample in 1994 indicates that there is an unexplained significant heterogeneity between clusters and provinces that cannot be explained by the fixed part of the model.

In the first four columns, odds ratios are presented for women stratified by place of residence. In rural areas, the effect of education is significant. Women with no education are less likely to use contraception and use among women with secondary education is higher than those with primary education. The pattern for the variable indicating whether the woman was working at the time of the survey is similar for rural areas to the total sample, where it is significant in the 1994 survey only.

The results for consumption scale in rural areas present interesting results. This variable is highly significant in the first survey and insignificant in the second survey. This would be indicative of a remarkable performance of the family planning programme, which has managed to remove differences in use by social class. Also, the role of the media in rural areas has changed over time, from being insignificant in 1988 to being highly significant in 1994.

In urban areas, old women are less likely to use contraception when compared to women aged 25-34, and the odds ratios for young women are not significantly different from the comparative group. The odds ratios are insignificant for all educational categories in urban areas except women with secondary or higher education in 1994. Also, there are no significant differentials by work status. This can be inferred to reflect that the programme has managed to cater for all population subgroups in urban areas. The differentials by parity in urban areas show low usage among women with less than two children compared to those with three to five children. Although the results for those with six or more children are not significant in 1988, these women are more likely to use contraception than the comparison group. Household decision-making is an insignificant factor in urban areas. Factors, which measure social class, consumption scale and exposure to media, have changed from being insignificant in 1988 to being significant in 1994, a reflection that as the programme has been developing it has managed to address all social classes.

Community Characteristics

The expansion of social services and infrastructure since 1981 has been one of the major achievements of the Zimbabwe government. It should be noted however, that the placement of these facilities has been part of the development process. When examining causal model of contraceptive use, these development processes relate to the mechanisms, which the process leads to spatial and temporal variations in contraceptive use. Here, three factors are included which reflect community characteristics (strata, community education and community transportation).

In columns 5 and 6 of Table 1, there is a strong relationship between contraceptive use and strata. Contraceptive use is higher in urban and commercial farming areas, although in the 1988 survey the results are insignificant. When examining rural strata only, women in commercial farms are more likely to use contraception than women in communal areas. In the Zimbabwean case, these stratum differences tend to reflect the spatial distribution of the population in relation to access to services. The main difference between communities in commercial farms and rural areas is the distribution of the population, where in commercial farms, the population is highly nucleated and any innovation is likely to have a greater impact on a nucleated settlement than a dispersed one. Also, in commercial farms, the population tends to be small comprising of owners, workers and their families and hence the programme would be addressing almost a homogeneous group in commercial farms. The other variables, which reflect community characteristics, are not significant predictors of contraceptive use. There are no indications that in more developed clusters, that is, with a secondary school within 5 kilometres or with a good transportation network, there is greater usage than in underdeveloped clusters.

Service Availability Factors

For the total sample, women who live in clusters with a CBD are likely to use contraception. Other outreach programmes, that is, mobile clinics and IEC campaigns do not have a significant impact on contraceptive use. Stratifying by place of residence, the presence of a CBD has significant influence in rural areas, indicating that CBDs in rural areas are being effective in motivating women to use contraception. The role of CBDs in rural areas, which is not significant in the first survey but becomes significant in the second survey shows the maturing of the programme. The role of CBDs could have had a small impact on contraceptive use in the 1980s as this was the time when the programme was being extended to rural areas, and dealt more with imparting knowledge rather than raising prevalence rates.

The effect of access to stationary facilities produce mixed results, which are difficult to generalise upon. From the 1988 surveys access to a family planning hospital shows a positive relationship with contraceptive use for the whole sample, which seems to indicate that distant clusters from family Planning hospitals have higher usage irrespective of the mode of transport available. One

common feature is that the factors, which are significant in one survey, are not in another, and that the relationship of a factor might be positive in one survey and negative in another.

When the models are stratified by place of residence, access factors are not significant in urban areas, except in the 1994 survey where facilities which are within walking distance of less than 10 kilometres have higher usage. When considering rural areas alone, access factors are not significant for both surveys. Also, the effect of other stationary facilities, pharmacies and private doctors, are not significant in both rural and urban areas, except for the 1988 survey where usage is high in urban clusters with pharmacies.

Cohort Effects

The models specified above have been fitted separately for women who are less than 35 and those who are over 35 years old and the results are presented in Table 2.

Although the models include all the variables, the results presented in Table 2 show the odds ratios for service availability factors only, as household, individual and community factors maintain the relationships of being significant as was discussed previously. This approach of differentiating between young and old cohorts helps in understanding whether service availability factors have differential effects on young and old women.

The influence of service availability differs between young and old women. Among women who are aged less than 35 years, the availability of a CBD in the cluster is significant in 1988 but insignificant in 1994. This asserts the importance of easy access to contraception in the early stages of the programme. Also access to stationary facilities especially hospitals with family planning is significant in 1988 and insignificant in 1994. The results in 1988 show that where access is costly in terms of transport and distance, there is less usage of modern contraception among young women. Also, the influence of other stationary like availability of a pharmacy with contraceptives is an important predictor of use among women in the 1988.

The results for old women (aged 35 years and over) present some unexpected results. Women who live in clusters where access is more costly are likely to use contraception. For example, where the mode of transport is not motorised and distance more than 10km, usage is high. However, these access factors become insignificant in 1994. A more interesting pattern emerges for availability of CBDs in the cluster. Although this factor is insignificant in 1988, it becomes significant in 1994 indicating that as the programme develops, the availability of CBDs becomes an important factor in influencing use among old women. This is the opposite of what has been observed for young women where the importance of CBDs becomes insignificant as the programme develops.

Table 2 : Odds Ratios for the Three-Level Logistic Regression Model for Current Contraceptive Use among Sexually-Active Women for Different Cohorts.

Variable	<35 Years Old		=>35 Years Old	
	1988	1994	1988	1994
CBD in Cluster				
No CBD (Reference)	1.00	1.00	1.00	1.00
CBD available	1.33***	1.04	1.09	1.57***
IEC/Mobile Clinic in Cluster				
Not Available	1.00	1.00	1.00	1.00
Available	0.93	1.01	1.21	0.85
Access to Family Planning Hospital				
Motorised <=10km	1.00	1.00	1.00	1.00
Motorised >10km	0.62***	1.34**	1.65	1.30
Walking/Other <=10km	0.54***	1.27	1.03	1.00
Walking/Other >10 km	0.61***	1.25	1.96**	1.40
Access to Family Planning Clinic				
Motorised <=10km	1.00	1.00	1.00	1.00
Motorised >10km	1.37	0.81	2.18**	1.17
Walking/Other <=10km	1.20	0.79	0.90	0.92
Walking/Other >10 km	1.52**	0.91	0.79	1.25
Availability of Pharmacy in Cluster				
Available	1.36***	1.09	1.28	1.29
Not available	1.00	1.00	1.00	1.00
Availability of Private Doctor				
Not available	1.00	1.00	1.00	1.00
Available	1.36*	0.86	1.66*	1.04
Random Effects				
Cluster-level variance	0.07 (0.04)	0.09 (0.04)	0.07 (0.06)	0.08 (0.05)
Provincial-level variance	0.00 (0.00)	0.04 (0.03)	0.00 (0.00)	0.11 (0.07)

Educational Effects

The approach, which has been used for measuring cohort effects, is used here to measure educational effects. Three models are fitted for each of the educational groups: none, primary and secondary plus. The results are presented in Table 3.

One common feature among all educational categories is the change in the relative risks for availability of CBDs in the cluster between the survey period. The availability of a CBD in the cluster, which is insignificant in 1988 for all educational groups, becomes significant in 1994. This suggests that the effect of the CBD programme has been effective in motivating women to use contraception in recent years. Also, except for a few significant categories,

access to family planning hospitals is not significantly associated with a greater probability that a woman has adopted contraception. Access to family planning clinics is highly significant among those with no education. Despite access being more difficult in terms of distance and transport to family planning clinics, there is high usage in these clusters.

Table 3 : Odds Ratios for the Three-Level Logistic Regression Model for Current Contraceptive Use among Sexually-Active Women by Educational Group.

Variable	No Education		Primary		Secondary or higher	
	1988	1994	1988	1994	1988	1994
CBD in Cluster						
No CBD Visits (Reference)	1.00	1.00	1.00	1.00	1.00	1.00
CBD available	0.90	2.01**	1.17		0.96	1.71***
		*		1.22**		
IEC/Mobile Clinic in Cluster						
Not Available	1.00	1.00	1.00	1.00	1.00	1.00
Available	0.85	0.82	1.06	0.90	1.14	0.82
Access to Family Planning Hospital						
Motorised <=10km	1.00	1.00	1.00	1.00	1.00	1.00
Motorised >10km	0.90	1.85	0.80	1.35	1.23	0.79
Walking/Other <=10km	0.68	1.49	0.62*	1.27	1.06	0.64
Walking/Other >10 km	0.94	3.15*	0.83	1.31	1.05	0.93
Access to Family Planning Clinic						
Motorised <=10km	1.00	1.00	1.00	1.00	1.00	1.00
Motorised >10km	2.76	1.47	1.27	0.90	0.78	1.80
Walking/Other <=10km	2.58**	0.77	0.85	0.89	0.78	1.44
Walking/Other >10 km	3.42**	1.09	0.92	1.06	0.90	1.51
Availability of Pharmacy in Cluster						
Available	0.81	1.07	1.76**	1.16	1.24	1.15
Not available	1.00	1.00	1.00	1.00	1.00	1.00
Availability of Private Doctor						
Not available						
Available	1.00	1.00	1.00	1.00	1.00	1.00
	1.92	0.67	0.89	1.16	0.83	0.99
Random Effects						
Cluster-level variance	0.22	0.22	0.08	0.12	0.00	0.00
	(0.15)	(0.14)	(0.04)	(0.06)	(0.00)	(0.00)
Provincial-level variance	0.00	0.00	0.00	0.02	0.00	0.00
	(0.00)	(0.10)	(0.00)	(0.04)	(0.00)	(0.00)

Discussion

The changes which have been occurring to family planning in Zimbabwe have been documented in this chapter. The prevalence rate for modern contraception is 31% among all women and 42% among married women. This is the second

highest rate recorded in Sub-Saharan Africa. The changes in method-mix show a decline on the reliance on the pill and increasing usage of the condom and injectables. Also, use of traditional methods has been on the decline. However, use of long-term and permanent methods like sterilisation and IUD's remain very low in Zimbabwe. The reason for this lies in the heavy reliance on an outreach programme which has been successful in marketing the pills at the expense of clinical methods.

The contraceptive revolution in Zimbabwe shows that the pioneers in adopting family planning methods were young and middle-aged, high parity women, better-educated women, urban women and those in high social classes. The trends indicate that use of modern contraception is spreading to rural areas and less-privileged women. The role of the media in this revolution is quite remarkable as women who are exposed to any form of media are twice as likely to use contraception.

The availability of CBDs in clusters is associated with high contraceptive usage. This is a positive finding as public health policy has aimed to make available CBDs to all communities in Zimbabwe. The results for access to stationary facilities, though statistically insignificant, have a relevant predictive value. There is a need to improve the effectiveness of stationary facilities in dispensing contraception in areas where such facilities exist and provide new ones in clusters where stationary facilities are not available.

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