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**RESEARCH PAPER**

# Regional Variation in Acceptance of Punjab's Family Planning Programme: A Comparative Analysis of Northern, Central and Southern Regions

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| PAPER INFO | ABSTRACT |
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| <br>**\*Corresponding Author**<br>tpwo.shujabad@gmail.com | This research study is devised to analyze the impacts of those factors which are linked with regions in order to classify and resolve persistent social barriers to the further up-scaling of contraceptive use in the three regions of Punjab. It explores the impacts of three pre-conditions for the use of contraception i.e. readiness, willingness and ability which were recognized in the Coale/ Lesthaeghe framework. Further, in order to regress the use of contraception on these factors, a multilevel logistic model is applied. The sample of 600 women has been taken from six districts of these three regions i.e. North, South and Central Punjab. Results of the analysis depict that there were significant regional variations which can be attributed 50% to the combine effects of Readiness & Willingness. However, Regional variation in Ability has little impact. In all models, the effects of individual factors remain stable after inclusion of regional factors. |

## Introduction

Pakistan, having more than two hundred million populations, is considered the 6th largest populous country of the world. Between the 1950s and 1980s, Pakistan's population rapidly increased as a result of declining mortality and persistently high fertility. High population growth has been acknowledged as a threat to the country's already slow socio-economic development since the late 1950s, and since then its population and health policies have been geared towards lowering the TFR. Fertility levels, however, remained almost stable until the end of the 1980s, and the onset of fertility transition was confirmed only in the 1990s. Since then the TFR has declined very rapidly: from around six children per woman in the 1980s to four children per woman in 2006/7 (NIPS *et al* 2008). Recent estimates indicate a further decline in TFR to 3.3 in 2011 (United Nations Population Division, 2013).

In Pakistan, Family Planning program was started in 1960s but the Contraceptive Prevalence rate is still 36% that is not satisfactory. This problem further aggravates the situation when discontinuity in Contraceptive usage starts. Punjab,thelargest populated province of Pakistan, is facing the more population problems than any other province. There are various development programs introduced by the government for the welfare of the masses but the output of these program proved less effective due to rapid increase in population giant.

## Punjab's Family Planning Program

The Population Welfare Program in Punjab is an on-going endeavor for social development which is based on development and strategically focused population policies which are accepted nationally at large. The main purpose of this program is to attain stabilization of population through sensitizing the individuals, families and communities about the significance of small family norms i.e. adoption of different methods and techniques voluntarily for limiting or spacing the births.

The main objectives of the program are devised to reduce fertility rate, to slow down the population growth up to replacement level, to minimize unmet need and to ensure universal access to family planning methods through maximizing the Contraceptive Prevalence Rate (CPR). Punjab is the 2nd largest province of Pakistan in term of area i.e. 26%, while it has share of 55.6 per cent (an estimated 98.3 million) in the total population of the country. It is also worth mentioning to highlight that the per annum increase in its population is 1.82 million, which has indirect impacts on socio-economic development and the same dilutes the performance of developmental projects (PWD, 2013, p.9).

In the backdrop of above, the vigorous efforts of the different governments to improve the living conditions of the masses through generating more resources are not proving fruitful. Generating more resources for improving the living conditions thus becomes a difficult task. In the past, high population growth has significantly added to the population living below poverty line. Based on the present growth patterns and trends, with population projections for Punjab of 113 million by the year 2020 and 128 million by 2050, the economy would not be able to sustain the growing population, and no improvement in the quality of life would seem possible even under the most favorable assumptions. The present population trend is, therefore, a matter of deep concern and should undoubtedly be a central issue in the overall planning perspective.

The Family Welfare Program in Punjab is based on 1500 Family Welfare Centre at Union Council level, 121 Family Health Clinics and 117 Mobile Service Units at Tehsil level. The focus of these Service Delivery Outlets is provision of FP Methods to the inhabitants of urban, rural and remote areas in order to achieve the policy goals and objectives. These services include, provision of modern contraceptive methods to eligible couples and provision of general medicines for the improvement of health of mother and child.

Population Welfare Department Punjab (PWD) is not the only state institution providing contraceptive services to the eligible couples as it has close liaison with health department and NGOs working in the country but it has the main responsibility to achieve the desired results with the implementation of population welfare program policies. Before 18th amendment this department was in the federal pool but now it is provincial responsibility to make strategies for the achievement of desired high Contraceptive Prevalence rate and reduce fertility rate in the province. There is a need to explore those regional determinants which are hurdles in the acceleration of population welfare program. This study is devised to focus on the province of Punjab after splitting it into three viable and generally accepted regions. This bifurcation is not only based on physical structure but also, environmental, developmental and cultural factors.

**Literature Review and Theoretical Framework**

Bongaarts (2014) recently reiterated, a family planning program has proximity to widen the gap between desired and actual fertility by raising the demand for family planning. Dissemination of knowledge on the benefits and availability of contraceptive methods will not only lead to higher uptake among those who want to limit their fertility, but might also change the attitudes (or willingness) of the ones that had not considered limiting the number of their off-spring before.

In order to understand the variations in contraceptive use and fertility rate, this study presents an assessment of the level and structure of fertility within the three regions of Punjab, identify barriers that are hampering the use of contraception sustaining high unmet need, and analyze the variations in the performance of the family planning program, using the theoretical framework described below.

Literature indicates that the differences in contraceptive use may result from three explanations (Kimani, 2007, Cammack, 2001). The socio-economic explanations of Contraceptive adoption clearly stipulate that the variations in contraceptive use are due to differences in socio-economic status of the population. The process of development, by raising the costs associated with children and reducing their benefits, induces couples to desire fewer children and to use contraceptives to achieve smaller families (Bongaarts, 1997). Bongaarts & Watkins (1996) also argue that development opens up social networks and channels of communication that promote contraception. Lesthaeghe&Vanderhoeft (2001) developed a more unified framework to explain the success or failure of family planning programs across countries, using the three pre-conditions of Coale (1973) for the adoption of contraception i.e. Readiness, willingness and ability. Readiness measures effects of socio-economic development, willingness would translate the socio-cultural weight and ability could be linked to family planning program capacities and accessibility. The three preconditions are sequentially hierarchical. Readiness is the first condition that should be present to be able to evaluate the two others. Also, ability can only operate if there is willingness.

The aim of this research is to test the role of these preconditions by using a multi-level model in explaining the causes of regional level variations in the use of modern contraceptive methods in Punjabthat captures both individual-level and regional-level effects. Much research has shown thatboth the individual-level and regional-level factorsare responsible for variation in contraceptive use (Elfstrom, 2012; Stephenson et al., 2007).

Three basic concepts will be used in order to measure the behavior of contraceptive users. These three concepts are also known pre- conditions of contraceptive use and this research study conceptualized on these concepts which are readiness, willingness and ability. Under these headings, Coale (1973) introduced a model to measure fertility transition. An exhaustive literature review revealed that there is no study conducted in Punjab even in Pakistan on this simple conceptualization.

## Readiness

The first precondition readiness indicates the fact that the change of behaviour is only possible if that is beneficial or advantageous for the actor. Another thing is that the factor of utility should be evident and must outweigh its disutility. This precondition is primarily associated with the process of decision maker after considering microeconomic cost-benefit calculus.

Itis subjective need to limit child bearing and space birthsaltogether (Cleland, 2001). The assumption is that couples balance benefits against costs attributed to the child in determining desire for want of child. The use of contraception must be advantageous to couples in all respects. This is generally linked to a higher level of urbanization and economic development. However, previous studies have shown that in Punjab the demand for family limitation is in some extent different between the poor and the rich and between the rural dwellers to urban residents. In this regard, Poverty Malthusianism is put forward as an explanation by the different social researchers (Ndaruhuye et al., 2009). Given the lack of land, having an extra child would dilute rather than strengthen household's resources, and rural regions provide few other labor opportunities apart from farming. That is why we expect a different desire for family planning in poor and rural regions compared to urban and more developed regions.

## Willingness

The second pre-condition of FP usage indicates the acceptability of contraceptives in a society or locality on the grounds of religious or ethical legitimacy. This precondition addresses the question that how new forms of behaviours counter the established codes of conduct and traditional beliefs and how these moral objections and fears can be overcome.

For second condition, Coale (1973, p. 65) defines the "calculus of conscious choice". The attitude in favor of adoption of certain contraceptive method is mainly linked with different social scenarios including legitimacy, religious prescription, and code of conduct, ethical considerations, culture and traditional beliefs. Much research in Pakistan (Bawah, 1999; Castle, 1999; Hulton, 2000) has documented resistance in the adoption of modern contraceptive methods due to lack of willingness despite the awareness of the need to limit childbirths. In Punjab, legitimacy will not be a problem as the legislation is the same throughout the province. However, religious opposition may occur, particular among Various Muslim sects (Ndaruhuye et al., 2009; Westoff, 2013).

**Ability**

The availability of new techniques forms the behaviour of society in the adoption or utilization of that technique; however, the same is largely based on accessibility of those innovations to the masses. In this regard, the cost of that commodity may reduce the factor of ability, even if it has psychological impacts. The intensity of accessibility to new facilitating factor may disappear this third pre-condition. In this scenario, three factors play pivotal role which include access to the services, supply of services and knowledge of contraceptive methods (Cleland, 2001; Lesthaeghe&Vanderhoeft, 2001). Knowledge about contraceptives is almost universal in Punjab with 95% of married women knowing at least one method (MICS, 2014)) and therefore less likely to be a constraint. Access in terms of distance to the nearest health facility also seems to be a minor problem, given the high density of the population (400 people per square kilometre).

Explaining the role of each interaction on fertility preferences and behavior, Rossier and Bernardi (2009, p. 467) rightly argue that the practices and beliefs in a society can be explained on the basis of social influence. The changes in a society even in macro level factors adopt new behavioral beliefs. The fertility intentions of an individual navigate in a complex environment if the institutional role and knowledge of the product is effective and comprehensible.

According to (Bongaarts and Watkins 1996, p. 639) social interaction is multilayered and functions at three levels of aggregation. The reproductive behavior is influenced by these three levels of aggregation. When these social interaction networks connect individuals through migration and language are known as personal networks. In the global society, international organizations, trade cartels and global channels connect the nations throughout the world. All the ideas, information and social norms make favorable environment for the effective contraceptive use.

This research study has conceptualized the model built around the factors related to readiness, willingness and ability. The application of these three preconditions is result oriented in various fields and particularly effective in moral and economic dimensions. The various social science disciplines are connected due

to the use of readiness, willingness and ability model. The economic aspects of social behaviour are covered through readiness precondition; the cultural, social, and religious norms and values are analysed through willingness precondition; and the programme variables are integrated in third precondition that is ability.

This conceptualization provides an integrated overarching framework comprised of three pre-conditions which have different narratives and the same techniques are existed in the various social science disciplines (compare van de Kaa, 1996; Burch, 1996; Lesthaeghe, 1997).

**Table 1**
**Measures of Readiness, Willingness and Ability**

| Pre-conditions | Variables |
|---|---|
| **Ready** | • Want to delay next child for 2+ years<br>• Want no more children or sterilized |
| **Willing** | • Woman approve FP<br>• Discuss FP with partner |
| **Ability** | • Knowledge of contraceptive Methods<br>• Know source of Family planning |

**Material and Methods**

In this research work, there are three reasons for using multilevel regression model which are interlinked with each other. First, it is helpful in dealing with the hierarchical data structures like the one we are using in this study. Individuals are nested within regions. They not only share customs, but more importantly also various health services including contraception, and the structure of these health facilities are organized at district level.

Second, the dependent variable, current use, is measured at the individual level while key independent variables are measured at the regional level. Multilevel modeling is appropriate approach that takes into consideration both individual and regional effects on individual behavior. Third, the multilevel modeling provides information on the proportion of total variation explained by regional-level factors. The modeling allows for random intercepts across regions and assumes fixed effects of individual variables across regions.

This model may be explained into two equations which refers to individual level and regional level factors.

Individual level:

$\text{logit}(C_{ij}) = \alpha_j + \beta X_{ij} + e_{ij}$

Regional level:

$\alpha j = \gamma 0 + \gamma Zj + uj$

$uj \sim (0, \, 00)$

Where:

logit (Cij), the dependent variable, is the logarithm of the odds Cij for the ith individual in the jth region to use a modern contraceptive method. Xij represents individual level variables and γZj represents regional level factors. αj is a random intercept, which varies across regions, and β a vector of fixed coefficients for individual-level factors.

The error term uj is the regional variance and is assumed to have a normal distribution with mean zero and variance 00. It reflects regional differences that are not explained by variables in the model. In order to assess changes in outcome from the different subsets of regional variables, especially the contribution of each factor or category of regional factors in the variation in contraceptive use, we examine six models sequentially. The models show the percentage of regional variation attributable to each category of regional factors.

**Results and Discussion**

**Table 2**
**Demand for Children**

| Region | No More Children | 1-2 | 3-4 | Undecided | Total |
|---|---|---|---|---|---|
| South Punjab | 35 | 23.5 | 4.5 | 37 | 100% |
| Central Punjab | 57 | 20.5 | 2.5 | 20 | 100% |
| North Punjab | 70 | 16.5 | 1 | 12.5 | 100% |
| **Total** | **54** | **20.16** | **2.67** | **23.17** | **100%** |

**Source:** Survey Results Collected by the Researcher

**Table 3**
**Region * Reasons for using Contraceptives Cross tabulation**

| Region | Spacing | Limiting | Total |
|---|---|---|---|
| South Punjab | 64.47 | 35.53 | 100% |
| Central Punjab | 34.95 | 65.05 | 100% |
| North Punjab | 18.1 | 81.9 | 100% |
| **Total** | **35.93** | **64.07** | **100%** |

**Source:** Survey Results Collected by the Researcher

**Table 4**
**Region * Can you easily Discuss about FP Methods with Your Husband?**
**Cross tabulation**

| Region | YES | NO | Total |
|---|---|---|---|
| South Punjab | 24.5 | 75.5 | 100% |
| Central Punjab | 41 | 59 | 100% |
| North Punjab | 59.5 | 40.5 | 100% |
| **Total** | **41.67** | **58.33** | **100%** |

**Source:** Survey Results Collected by the Researcher

**Table 5**
**Region * Who Decide in Family to Use Contraceptive? (Cross tabulation)**

| Region | Myself | Husband | Both | Mother in Law | Others | Total |
|---|---|---|---|---|---|---|
| South Punjab | 10.5 | 48.5 | 22 | 12.5 | 6.5 | 100% |
| Central Punjab | 19.5 | 35 | 38.5 | 4.5 | 2.5 | 100% |
| North Punjab | 25 | 27.5 | 43.5 | 3 | 1 | 100% |
| **Total** | **18.33** | **37** | **34.66** | **6.67** | **3.34** | **100%** |

**Source:** Survey Results Collected by the Researcher

**Table 6**
**Region * How Many Methods Do You Know About Contraceptive Cross tabulation**

| Region | How Many Methods Do You Know about Contraceptive | | | | Total |
|---|---|---|---|---|---|
| | No Method | 1-3 | 4-6 | More than 6 | |
| South Punjab | 7.5 | 62.5 | 20 | 10 | 100% |
| Central Punjab | 5.5 | 32.5 | 27 | 35 | 100% |
| North Punjab | 4 | 25 | 47 | 24 | 100% |
| **Total** | **5.67** | **40** | **31.33** | **23** | **100%** |

**Source:** Survey Results Collected by the Researcher

**Table7**
**Region * From Where You Get Contraceptive Methods (Cross tabulation)**

| Region | Never Get | Family Welfare Centre | Health Deptt. | NGO | Market | Total |
|---|---|---|---|---|---|---|
| South Punjab | 32 | 21.5 | 24.5 | 5.5 | 16.5 | 100% |
| Central Punjab | 25 | 32 | 28 | 3.5 | 11.5 | 100% |
| North Punjab | 17 | 21 | 29 | 10 | 23 | 100% |
| **Total** | **24.67** | **24.83** | **27.17** | **6.33** | **17** | **100%** |

**Source:** Survey Results Collected by the Researcher

## Multilevel Regression Results

**Table 8**
**Multilevel random coefficients of selected variables on current use of modern Methods**

| Variable | Mod 1 | Mod 2 | Mod 3 | Mod 4 | Mod 5 | Mod 6 |
|---|---|---|---|---|---|---|
| **Constant** | 0.288*** | -0.028 | 1.677* | 1.231 | -0.168 | -1.922** |
| **Regional Level Factors** | | | | | | |
| *Readiness* | | | | | | |
| Desire 4 child + (%) | | | -0.012** | | | 0.014*** |
| Demand FP (%) | | | 0.031*** | | | 0.022** |
| *Willingness* | | | | | | |
| **% women app FP** | | | | 0.021*** | | 0.014*** |
| **% Discuss FP with Partner** | | | | -0.014** | | -0.011** |
| *Ability* | | | | | | |
| **Aver. Cont. Meth** | | | | | -0.110 | |
| **FP Enviro index** | | | | | 0.093 | |
| Individual-level characteris | | | | | | |
| **Woman's education (ref. No ec** | | | | | | |
| Primary | | 0.185** | 0.181** | 0.173** | 0.186** | 0.165** |
| Secondary | | 0.250** | 0.246** | 0.243* | 0.251** | 0.236* |
| Higher | | 0.711*** | 0.687*** | 0.717*** | 0.710*** | 0.685*** |
| **Wealth index (ref. Poor** | | | | | | |
| Poor | | 0.168* | 0.156* | 0.175* | 0.165* | 0.163* |
| Middle | | 0.487*** | 0.473*** | 0.495*** | 0.483*** | 0.481*** |
| Richer | | 0.585*** | 0.571*** | 0.592*** | 0.581*** | 0.577*** |
| Richest | | 0.543*** | 0.528*** | 0.566*** | 0.538*** | 0.552*** |
| **Woman's age (ref. 15-24** | | | | | | |
| **25-34** | | -0.098 | -0.104 | -0.106 | -0.097 | -0.116 |
| **35+** | | -0.391*** | -0.400*** | -0.401*** | -0.391*** | 0.416*** |
| **No. of children (ref. 1-** | | | | | | |
| **3-5** | | 0.144* | 0.150** | 0.142* | 0.144* | 0.151** |
| **6+** | | -0.097 | -0.087 | -0.094 | -0.096 | -0.081 |
| **No Child** | | -3.918*** | -3.911*** | -3.919*** | -3.917*** | 3.911*** |
| **/lnsig2u** | -2.064 | -2.102 | -2.983 | -2.814 | -2.135 | -3.780 |
| **Sigma_u** | 0.356 | 0.350 | 0.225 | 0.245 | 0.344 | 0.151 |
| **rho** | 0.037 | 0.036 | 0.015 | 0.018 | 0.035 | 0.007 |

\* p<0.10          \*\* p<0.05          \*\*\* p<0.01

## Discussion

In this study, the most interesting aspect is the regional variation. With only a constant term included (model 1), the regional error variance is 0.356. This value has no direct substantive meaning because the error variance is arbitrarily set to 1.00 in the multilevel model. Rather, our attention is focused on how much this variance changes by inclusion of explanatory variables in the model. The model including

individual variables reduces the error variance slightly to 0.350, indicating that the regional variance is independent from individual factors.

Looking at the individual factors, the results are consistent with prior research. As is expected, contraceptive use is more likely among women more educated, or who live in richer households. Women with higher educational level are as two times ($\beta$=0.711) more likely to use modern contraception than the uneducated. A significance difference appears between poor and richer women: the first two groups display similar pattern as do the three higher quintiles. Younger women are more inclined to use contraception than older women.

The number of living children exhibits a curved pattern with contraceptive use. Contraceptive use is higher among women with three to four children than those with fewer or more children.

We present the results sequentially from the first precondition to the last because of the hierarchical order. There is no need to test availability if there is no willingness and much less without readiness.

The readiness indicators exhibit significant coefficients after controlling for individual's variables. The coefficient is negative for the percent of women desiring larger families (4 or more) indicating that the presence of a high proportion of women wanting larger families reduces the likelihood to use modern contraceptive methods. In contrast, the presence of a great number of women in the region desiring either to limit their family size or to space births increases the log odds of adopting contraception. Readiness appears to be a substantial differential factor. Controlling for readiness, the remaining regional variance drops to 0.225. Readiness captures about 36% of the total regional variance. The effects of individual factors remain stable.

The willingness factors are also significant. The coefficient is negative for the percentage of religious and positive for the percentage of women approving family planning. The parameters of individual factors are not affected by the inclusion of the regional willingness variables. The regional variance declines by 31 % to 0.245. This means that the regional differentiation is partially due to differences in willingness.

The inclusion of variables related to ability hardly changes the regional variance, which declines only from 0.356 to 0.344, indicating that indicators of family planning supply do not play a differentiating role in contraceptive use. The effects of individual factors do not change.

By combining both readiness and willingness in the same model, ability indicators being excluded because they are not significant, the results of individual variables and regional factors remain unchanged compared with the previous models. However, the combination of readiness and willingness in the same model

diminishes the regional variance by more than half, from 0.356 to 0.151 = 58%. This means that the lower contraceptive use level in some regions is due to both i.e. lower readiness and lower willingness.

**Conclusion**

Despite the dramatic overall increase in contraceptive use, striking differences in contraceptive use have appeared between regions. According to many researches (MICS, 2011), intra-country contraceptive differences result from individual characteristics and/or regional specificities. Thus, this thesis has been interested to find out which factors explain this difference. The aim has been to look beyond individual characteristics and test the regional-level factors by considering theCoale (1973) and Laesthaeghe&Vanderhoeft C. (2001) model which is based on three preconditions for the adoption of modern contraceptive methods which include readiness, willingness, ability.

Results of the study do not show any evidence regarding effect of ability in the regional variations of the contraceptive use. However, the resultsconfirmed that the regional variations in contraceptive use in Punjab are due partially to regional factors, especially those related to readiness and willingness conditions. Our results did not show any evidence regarding effects of ability.

Contraceptive uptake was lower in regions with higher proportion of women desiring many children, with higher proportion of religious believers or a higher proportion of women disapproving family planning. These regions are Central and Southern part of the province. The religious beliefs of the women living in these areas plays dominant role in disapproving the contraceptive use.

The conclusion is that the persistence of pro-natalist attitudes and the weak willingness to use contraception associated with social barriers are the most common issues that prevent women from using modern contraceptive methods. Access and availability of family planning services are not sufficient conditions for contraceptive adoption. Moreover, this study also highlights the need of political commitment for the contraceptive uptake. It also displays that economic and socio-cultural barriers among the rural dwellers and poor people may be removed through a strong and impressive Family Planning Program.

# References

Bongaarts, J. (1997). *Trends in unwanted childbearing in developing world. Studies in Family planning, 28* (4), 267-277.

*Bongaarts, J. & Watkins S. C. (1996).Social interactions and contemporary fertility transitions. Population and Development Review, 22 (4), 639-682.*

Cammack, M. & Heaton T. B. (2001).*Regional variation in acceptance of Indonesia's family planning, Population Research and Policy Review, 20, 565-585.*

Cheema, A. (2008). *The Geography of Poverty: Evidence from the Punjab, The Lahore Journal of Economics Special Edition (September 2008)*, 163-188.

Cleland, J. (2001). *Potatoes and pills: an overview of innovation- diffusion contributions to explanations of fertility decline. In Diffusion processes and fertility transition: selected perspectives (ed. J. Casterline). Washington, DC: National Academy Press.*

Coale, A.J. (1973). *The demographic transition reconsidered. In IUSSP – Proceedings of the International Population Conference. Liège, Belgium: Eds. Ordina.*

Elfstrom, K.M. (2012). *The role of place in shaping contraceptive use among women in Africa,PLoS One. 2012;7(7):e40670. doi: 10.1371/journal.pone.0040670.*

Kimani, M. (2007). *Trends in contraceptive use in Kenya 1989-1998: The role of socioeconomic, cultural and family planning factors. African Population Studies,* 21 (2), 3-21.

Lesthaeghe, R.&Vanderhoeft, C. (2001).*Diffusion Processes and Fertility Transition: Selected Perspectives,National Academy of Sciences, Bookshelf ID: NBK223854.*

Mahmood, N. &Ringheim, K. (1997).*Knowledge, Approval and Communication about Family Planning as Correlates of Desired Fertility among Spouses in Pakistan. International Family Planning Perspectives, vol. 23, no.3, 122-145.*

National Institute of Population Studies (NIPS) (2007). *Pakistan Demographic and Health Survey 2006-07. Islamabad, Pakistan: National Institute of Population Studies (NIPS), Macro International; 2006.*

Ndaruhuye, M. D., Broekhuis A. &Hooimeijer P. (2009).*Demand and Unmet Need for Means of Family Limitation in Rwanda. International Perspectives on Sexual and Reproductive Health, 35 (3),* 122–130.

Rossier, C. and Bernardi, L. (2009). *Social Interaction Effects on Fertility: Intentions and Behaviors. European Journal of Population 25(4): 467–485. doi:10.1007/ s10680-009-9203-0.*

Stephenson, R.,Baschieri, A., Clements, S.,Hennink, M.,&Madise, N. (2007). *Contextual Influences on Modern Contraceptive Use in Sub-Saharan Africa, Am J Public Health. 97(7): 1233–1240.*

United Nations Population Division, (2013). *World Population Prospects: The 2012 Revision. http://esa.un.org/wpp/unpp/panel_indicators.htm.*

Westoff, F. C. (2013). *The Recent Fertility Transition in Rwanda.Population and Development Review, 38 (supplement),* 169–178.