Sources of Decline in the Level of Intention to Use Modern Contraception among Women of Childbearing Age between 2010 and 2017 in Burundi

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Abstract

Background: In Burundi, the intention to use modern contraception is declining (from 66% in 2010 to 53% in 2016-2017) at a time when the country would like to see it increase to achieve development goals. **Objective**: To analyze the sources of this decline. **Methods**: The decomposition method is implemented. **Results**: The results show that the decline studied is essentially related to the effect of behavior change. Beyond the overall change, it is the standard of wealth and the region of residence that contribute, respectively, to 31% and 6% of the total change. Depending on how high the standard of wealth is, the contribution to this decline is high. Depending on the region, the South, West, and Central East regions contribute the most. **Conclusion**: These results show that beyond the standard of wealth, which cannot be the object of regional differentiation in terms of contraception, there are socio-cultural barriers that must be taken into account in the planning of interventions and FP services supply.

1. Introduction

Several authors agree that countries that have been able to control the general and selective mortality of women and children have relied on increased contraceptive use to control fertility and complete the demographic transition process [3]. Globally, Sub-Saharan African countries, with the lowest contraceptive prevalence rates and some of the highest fertility levels in the world, are those that have not yet achieved fertility control, hence the common term "countries with unfinished transitions" [4,11]

In Burundi, the beginning of mortality erosion would be in the 1930s, a period that coincides with the introduction of new food crops and the beginning of the first vaccination campaigns. These actions led to a considerable reduction in maternal and infant mortality, as well as in mortality in general [8]. Since then, the Burundian population has continued to grow due to a largely positive natural balance. By 1965, fertility had increased rapidly to 7.4 children per woman. The fertility trend line would have marked its inflection point shortly after that date, falling to 7.1 children per woman during the 1970-1971 demographic survey. Five decades after this inflection point, fertility remains at the high bar for completion of the demographic transition. In 2017, it was 5.5 children per woman, after being 6.8 in 1987 and 6.4 in 2010 [6,7].

After nearly 40 years of promotion of Sexual and Reproductive Health by the National Health and Reproductive Program (PNSR), the contraceptive prevalence rate does not reach one-third of women of reproductive age (29% in 2017). From 66% in 2010, the rate of intention to use contraception dropped to 53% in 2016-2017. However, more than 97% of Burundian women know at least one modern contraceptive method [6,7].

This study, in an effort to elucidate the challenges of the demographic transition process in Burundi, examines the sources of the decline in the level of intention to use modern contraception between 2010 and 2016-2017. It hypothesizes that the decline in the level of intention to use modern contraception is consistent with the compositional effect associated with the increase in the proportion of women living in poor households and the increase in the proportion of women working in agriculture and without jobs. In addition, it is due to the performance effect, with women in the Central-Eastern and Southern regions making the greatest contribution to the decline in intentions studied, as well as women of Protestant faith.

To our knowledge, there are no studies that have examined the sources of the decline in the level of intention to use modern contraception. However, we can find authors who mention poverty as being at the root of the lack of intention to control fertility in the context of Southern countries [11]. In Ethiopia, a study showed that the absence of economically profitable employment is a factor in the lack of fertility

control [12]. Region of residence is also indexed in studies conducted in rural Bangladesh [2], as is religion in the work held in Ghana, and Ethiopia [12,1]. Taking household standard of wealth, woman's occupation, region of residence, and woman's religion in the community as the classification variables, this study mines the data from the last two Demographic and Health Surveys of Burundi (DHSB) to verify the hypotheses.

2. Materials and methods

2.1. Data sources: The data are from the second and third DHSBs of 2010 and 2016-2017. Because they were collected on two different dates, they are practically more amenable to analysis of sources of change such as declining levels of contraceptive use intention [5].

2.2. Target population: At the time of data collection, 4225 women in 2010 and 6990 women in 2016-2017, in union and not using modern contraception at the time of the survey, expressed their future contraceptive intentions. In 2010, 70% of these women declared that they intended to use modern contraception, while this proportion decreased to 54.5% in 2016-2017.

2.3. Analysis variables: The application of the decomposition method requires data on the substantive variable, operationalizing the phenomenon under study, and at least one classification variable whose modalities are used to analyze the effect of the change [5]. Thus, the substantive variable is "intention to use modern contraception" and the household's standard of wealth, the woman's occupation, the region of residence, and religion are the classification variables.

2.4. Data quality: the variables used have zero non-response rates. In addition to the substantive variable, the classification variables used meet at least two out of three of the criteria of variability, relevance, and crumbling [5].

2.5. Analysis method: The decomposition method, used to analyze sources of change such as the decline in the level of contraceptive intention, makes it possible to break down the product of the observed social change into elementary components to estimate the relative contribution of two or more factors that contribute to it. The demographic decomposition makes it possible to disentangle the part of the change due to the modification of the structure of the population according to the different social strata, known as the "composition effect", from the part due to the change in behavior concerning the phenomenon studied in all social strata, whether they are at risk or not, known as the "performance effect". Thus, by taking the woman's occupation as a classification variable, the decomposition will make it possible to find the share of change due to the increase/decrease in the number of women in the class of inactive women, farmers, managers, shopkeepers, or others (composition effect) and the share due to the change in attitudes toward contraception in these different socio-professional categories (performance effect). This basic decomposition would make it possible to express the intention to use modern contraception (Y_t) as the weighted average of the contraceptive intentions of each socio-professional category (Y_{it}) by the proportion of women in the same category (W_{it}).

$$Y_t = \sum W_{it} * Y_{it}$$

where i is the socio-professional category and t is the time at the time of observation. By this formulation, the change in contraceptive intentions ($\Delta\hat{Y}$) between two dates t_1 and t_2 can be decomposed into two components that represent the composition effect (the change in the distribution of women across socio-professional categories) and the performance effect (the change in contraceptive intentions across socio-professional categories).

$$\Delta\hat{Y} = \qquad \sum \bar{y}_i * \Delta W_i \qquad + \qquad \sum \bar{w}_i * \Delta Y_i \ (1)$$

Total change =   *Composition effect*   +   *Performance effect*

$$\text{where } \bar{y}_i = \frac{Y_{it_1} + Y_{it_2}}{2} \text{ et } \bar{w}_i = \frac{W_{it_1} + W_{it_2}}{2}$$

Depending on whether the composition effect or the performance effect dominates, the analysis can switch to the advanced decomposition to overcome the lack of detail in the basic or simple decomposition.

Depending on whether the influence of behavioral change in socio-professional categories on the intention to use contraception dominates, the decomposition of the performance effect begins by estimating the relationship between this intention (Y) and socio-professional category (X) according to the regression equation:

$$Y_i = \alpha + \beta X_i + \mu_i$$

Where α represents the baseline contraceptive intention; β, the effect of socio-professional category X_i or, more explicitly, the decrease in the intention to use contraception associated with the unit decrease in the socio-professional category; μ_i the error, which can also be interpreted as the residual effect of factors other than socio-professional category X, not considered in the analysis.

From the above, the variation in contraceptive intention between the two periods is given by:

$$\Delta Y_i = \Delta\alpha + \bar{\beta}\Delta X_i + \bar{X}_i\Delta\beta + \Delta\mu_i \ (2)$$

Where $\bar{\beta}$ is the average change in the socio-professional category effect between the two periods.

Integrating (2) into (1), we obtain the following advanced decomposition:

$$\Delta\hat{Y} = \quad \sum \bar{y}_i * \Delta W_i \ + \ \underbrace{\sum \bar{w} * \Delta\alpha}_{(B1)} \ + \ \underbrace{\sum \bar{w} * \bar{X}_i\Delta\beta_i}_{(B2)} \ + \ \underbrace{\sum \bar{w} * \Delta\mu_i}_{(B3)} \ (3)$$

Total change =   *Composition effect*   +   *Performance effect*

This decomposition, more disaggregated from the performance effect, shows the share of change related to the decline in modern contraceptive intention in each socio-professional category (B1), the differentiation effect of the decline in contra-

ceptive intention according to socio-professional category (B2), and the residual effect of other variables not considered (B3).

In the case of the predominance of the composition effect, this could be disaggregated in the advanced decomposition by taking the strategy of decomposition by primary groups according to educational level. Thus, the proportion of women in each socio-professional category (w_i) will be a function of the number of women in that category (n_i) and the rate of education at the secondary level or higher in that same category (s_i).

$$w_i = n_i * s_i$$

The change in the proportion of women between the two dates depends on the change in the number of women (A1) and the high school and above education rate (A2).

$$\Delta w_i = \bar{s}\Delta n_i + \bar{n}\Delta s_i \quad (4)$$

Integrating (4) into (1), the total change is given by:

$$\Delta \hat{Y} = \sum \bar{y}_i * \bar{s}\Delta n_i \quad + \quad \sum \bar{y}_i * \bar{n}\Delta s_i \quad + \quad \sum \bar{w}_i * \Delta Y_i \quad (5)$$

$$\text{Total change} = \underset{(A1)}{\quad} \underset{\text{Composition effect}}{\quad} \underset{(A2)}{\quad} + \quad \text{Performance effect}$$

In the case of the importance of composition and performance effects, the decomposition method allows decomposing the change according to the formula:

$$\Delta \hat{Y} = \sum \bar{y}_i * \bar{s}\Delta n_i \quad + \quad \sum \bar{y}_i * \bar{n}\Delta s_i \quad + \quad \underbrace{\sum \bar{w} * \Delta\alpha \quad + \quad \sum \bar{w} * \bar{X}_i \Delta\beta_i \quad + \quad \sum \bar{w} * \Delta\mu_i}_{} \quad (6)$$

$$\underset{(A1)}{\quad} \underset{(A2)}{\quad} \quad \underset{(B1)}{\quad} \quad \underset{(B2)}{\quad} \quad \underset{(B3)}{\quad}$$

$$\underset{\text{Composition effect}}{\quad} \qquad \underset{\text{Performance effect}}{\quad}$$

Where A1 represents the effect of the change in the distribution of women according to socio-professional categories; A2, the change in women's education; B1, the decrease in contraceptive intention at the base; B2, the differentiation of contraceptive intention according to socio-professional categories; B3, the residual effect of the factors omitted in the regression equation.

2.6. Analysis tools: SPSS software is used for data quality assessment and variable recoding. Microsoft Excel, version 16 is used to analyze the change and make the necessary graphical representations.

3. Results

The simple decomposition shows that the decrease in the intention to use modern contraception is in all cases due to the performance effect. Whatever the classification variable is considered, the composition effect is negligible and sometimes negative. Its highest proportion is 2.16% for the religion variable and drops to -0.8% for the region of residence (Figure 1).

Figure 1: Simple decomposition of the decrease in intention to use modern contraception according to the classification variables
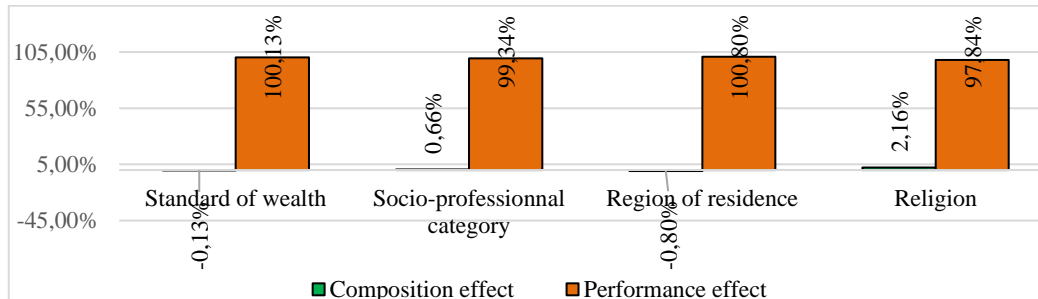
Up to this level, these results show that the decline in the level of intention cannot be attributed to the variation in the number of women according to the various categories of the ranking variables taken into account. Instead, the decline in intentions is due to the effect of changing contraceptive behavior across the different socioeconomic categories of women (performance effect) [5]. Thus, the analysis breaks down this behavioral effect on the decline in contraceptive intention. It distinguishes the part of the change attributable to the overall non-intention to use contraception (basic performance), the part attributable to the unit increase in the classification variable, and the part linked to the effect of the other variables not taken into account [5].

The results show that the most dominant behavioral effect set is that of baseline behavior or the overall behavior change (contraceptive intention) without considering the classification variable. The effect of the basic behavior is 68.56% against 31.09% attributed to the variation of the standard of wealth, the effect of the socio-professional category is 192.73% against -82.46%, the effect of the region of residence is 92.85% against 5.56%, the effect of the religion is 156.08% against -49% (Figure 2). It can be seen that socio-professional category and religion, instead of contributing to the decline in the intention to use contraception, contribute to the decrease in the effect of basic behavior on this decline, which was very considerable [5].

Figure 2: Contribution of the components of the performance effect to the decline in the intention to use modern contraception, according to the classification variables
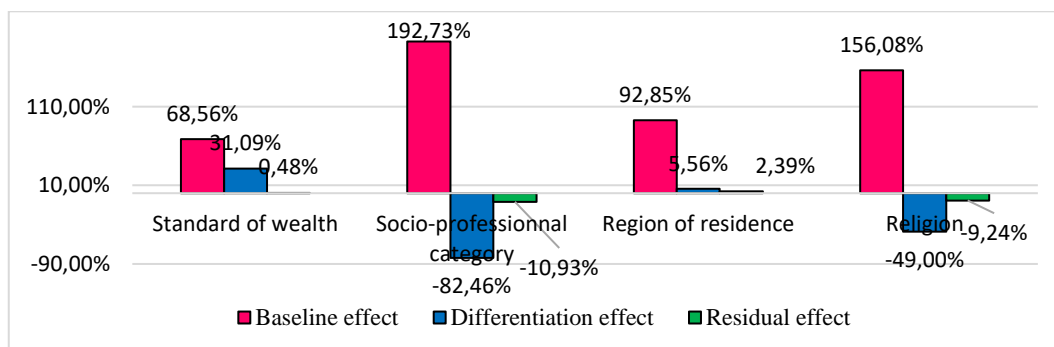
Substantially, it is the standard of wealth that seems to have the greatest behavioral effect among the four variables used, accounting for more than 31% of the decline in the level of intention to use modern contraception. The region of residence explains 5.56% of the decrease, compared to 92.85% due to the base effect (Figure 2).

The distribution of the decline in recorded modern contraceptive intention attributable to differentiation by the standard of living shows that the higher the standard of living, the greater the contribution to the decline in intention to use contraception. The proportions rise from 7% for the very low standard of living to 29% for the high standard of living, passing through 15% for the low standard of living, 21% for the medium standard of living, and 28% for the very high standard of living (Figure 3).

Figure 3: Distribution of the decrease in contraceptive intention attributed to the differentiation effect by the household standard of wealth category
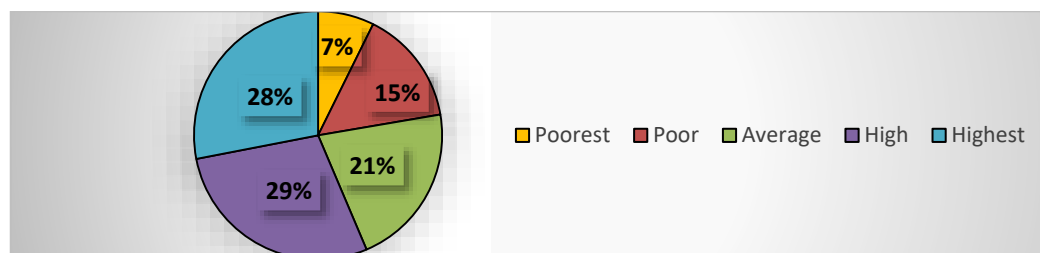
As for the distribution of the decline in the intention to use modern contraception, the results show that the southern region contributes the most to this decline, with a rate of 36%. It is followed by the West (23%), then by the Centre-East (21%), then by the North (11%) and finally by the city of Bujumbura (9%) (Figure 4).

Figure 4: Distribution of the decrease in the level of contraceptive intention attributed to the differentiation effect by region of residence
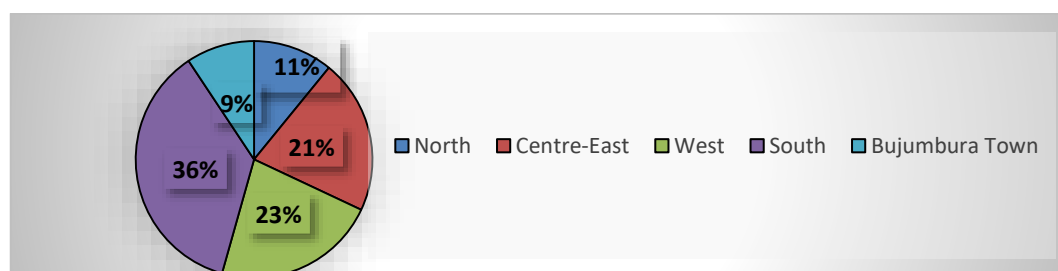
4. Discussion

The purpose of this study was to find the sources of the decline in the level of intention to use modern contraception among women of childbearing age in union between 2010 and 2017. Using the decomposition method, the study sought to

determine whether the decline in the level of intention to use modern contraception was related to the change in the structure of the female population according to the standard of wealth and socio-professional categories between the two dates (composition effect) and to the change in behavior according to the region of residence and religion.

The simple decomposition shows that this decline is not due to the distribution of women of childbearing age in the different categories at the two dates, regardless of the classification variable. On the other hand, it is the effect of behavioral change in the modern contraceptive intention that is observed for all the classification variables. For socio-professional category and religion, the constant is that these variables contribute to the decrease in the level of contraceptive intention in the social system as a whole since the differentiation of groups shows that they would be in favor of an increase in this level. For the other two variables, the results show that differentiation by well-being category absorbs 31% of the effect of change in contraceptive behavior, while differentiation by region of residence absorbs about 6%. The higher the well-being quintile, the greater the contribution of each standard of living category to the decline in contraceptive intention. By region, the South (36%), the West (23%), and the Central East (21%) contribute the most to this decline.

These results invalidate the hypothesis of a compositional effect of standard of wealth and socio-professional category while showing that the level of well-being acts on the other hand through a performance effect. As for the hypothesis of the performance effect of region of residence and religion, they partially confirm it, showing a 6% contribution of the differentiation of women according to the region to the overall decrease in the level of contraceptive intention.

Although no decomposition analysis of contraceptive intention was found, these results are comparable to other studies that use other methods in many respects. For example, results from a study conducted in Ghana [1] show that higher household wealth decreases the propensity to intend to use modern contraception. This is contrary to the results found in Ethiopia which show that household poverty sustains the non-intention to use modern contraception [12].

Within these results where high living standards seem to be the source of lower levels of contraceptive intention, the threshold effect of wealth standards could be argued, with minimal material comforts stimulating childbearing in middle-income households [10]. However, the threshold effect would not be sufficient to explain this downward trend in contraceptive intention. Indeed, in Burundi, where the same data do not seem to prove that the household's standard of living is statistically associated with contraceptive non-intention, one must interrogate the socio-cultural context data [9]. This would justify the differentiation effect of region of residence as a source of lower contraceptive intention among women, since regional differences in contraceptive use would be due to differentiation in terms of socio-cultural habits rather than in terms of income or material comfort, in a country where nearly 90% of the population lives on agriculture and livestock [8].

5. Conclusion

Noting a discrepancy between, on the one hand, the aspirations of Burundi's National Development Plan (PNDB) to reduce fertility to achieve national development goals and, on the other hand, the decline in the level of intention to use modern contraception among women aged 15-49 in union, this study seeks to highlight the sources of this change. Using data from the last two DHSBs, the decomposition method is used to test whether the decline in the level of contraceptive intention is related to the distribution of women in different social categories according to classification variables or the effect of behavioral change in these same categories between 2010 and 2017.

The simple decomposition shows that this decline is not due to the distribution of women of childbearing age in the different social categories on the two dates, regardless of the classification variable. Instead, it is the effect of behavioral change in the overall socio-cultural system of the country, which can also be differentiated by welfare/standard of wealth quintile and region of residence.

These results indicate the effect of significant structural changes in household socioeconomic development on family planning. Beyond the standard of living/well-being, socio-cultural characteristics must be invoked, with related regional variations. The South, West, and East Central regions should be prioritized for advocacy and decision-making.

Limitations: Focusing on the sources of decline in contraceptive intention has the merit of setting the stage for analysis by breaking down the observed change in contraceptive intention. However, as acknowledged by the pioneers of this methodology, it remains the descriptive analysis and does not control the effects of other variables.

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Conflicts of interest: We declare that there are no conflicts of interest.

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