Introduction

Much of the literature on unmet needs for contraception in developing countries focuses mainly on estimating the total demand for contraceptives in terms of quantity by estimating the unmet needs in order to adapt the supply and policies to the demand. Perspective that we believe is limited if it does not take into account the fear of side effects, as a new problematic that can affect the potential demand and increase the unmet needs, especially in countries where health system is deficient (Bongaarts, 1995; Baleys, 2008; Lachaud, 2010). In this regard, the objective of our paper is to understand how the fear of side effects of contraceptives may be generated and has spread. Subsequently, we analyze empirically the impact of this fear on the unmet needs for contraception in Latin America.

In the study of Sedgh *et al.* (2007) on the reasons for not using contraception, two main reasons stand out in the case of countries in Latin America and the Caribbean, "Exposure time" and "Health / fear of side effect." In Bolivia, the percentages of married women of 15-49 years old with unmet needs due to problems with the «Health Concern and fear of side effect» among married women of 15-49 years old have increased from 11% in 1989 to 24% in 2003. In Republic Dominican, in 2002, it was 26% among married women of 15-49 years old and 11% among never married women. In Haiti, it was 43% among the first group and 36% the last group. In addition, this same study shows little difference between socioeconomic status and demographic characteristics of women. Therefore, the main question of this work is: controlling all others factors determinants, how fear of side effects/health concerns impacts unmet needs for contraception in Latin America?

To answer this question, we will analyze theoretically and empirically the situation in three countries in Latin America, Haiti, Bolivia and the Dominican Republic for which we have comparative data. The work is divided in three parts: a theoretical analysis, the methodology and a brief presentation of the results.

Fear of side effect and unmet need for contraception: incompatibles terms?

Generally, family economists consider that the use of contraceptive methods responds to a real demand to stop childbearing or to delay a birth (Becker, 1960, 1981). Contraceptive use would only eliminate unwanted childbearing or allow us to choose the exact time when we want having children. From this perspective, any woman who really wanted to use contraceptive methods would find the all necessary information and resources like abortion, abstinence for doing it (Becker, 1976). Thus, the non-use of contraceptive methods corresponds to a lack of motivation, and it does not reflect neither the actual demand nor a need; and, even less an unmet need due to fear of side effects. However, statistics of several countries in different parts of the world show the opposite (Sedgh, 2007). Indeed, as reported by women, apart factor of exposure to risk, fear of side effects would be the second leading cause of unmet needs in the region of Latin America (1 in every 4 women with unmet need in some countries) and it is increasing in many countries in the region (Sedgh, 2007). Therefore, we wonder if unmet needs and the fear of side effects are really incompatible.

Fear of Side Effects and Unmet Needs: What's the connection?

Can the fear (of side effects) influence women decision for not using contraceptive methods, even if she wants to stop childbearing or delay a birth? How can we explain the decision-making for not using any contraceptive method, in spite of needs? A number of scholars have conducted research on the impact of fear, like a psychological factor or even a rational factor, on making-decision in uncertain conditions. Generally, there are three perspectives that explain how the fear can affect the decision-making: Expected Utility Theory (1), Experience personal in the past (2) (retrospective theory) and Social interactions (3). In the following, we will discuss briefly the contributions of various disciplines to an understanding of the effects of fear on the contraceptive behavior or on the unmet needs.

Expected Utility (Gains) Theory: Anticipation effects

One of the first perspectives for understanding the behavior in decision-making is the Expected Utility (or Gains) Theory (EUT) (Schoemaker, 1982, 2010). According to this perspective, to explain the making-decision, the concepts of *uncertainty* and *associated probabilities* are important. Contrary to the neoclassical theory that is based on the assumption of perfect availability and accessibility to information, according to this theory, uncertainty and often imperfect accessibility to information play a key role in decision-making. Gains (and losses) are calculated or anticipated on a probabilistic basis in a context of uncertainty. These expected utility and the associated probabilities are, according to this approach, rationally and objectively calculable and can be maximized (Schoemaker, 1982).

However, in the context of high uncertainty, the objective probabilities are distorted (or adjusted according to the information held or believes to hold each actor) in subjective probabilities (Allais, 1953, Akerlof and Yellen, 1987). According to Allais (1953), generally, people tend to overestimate (or underestimate) the objective probabilities in function of their beliefs or their reality understanding. This deformation can create some advantages situation for some actors, and some panics situation, stress and fear for others. That will not be without consequences on decision making (economic, financial, and social). This would also explain some irrational, unexpected and volatile (financial) behaviors of some actors on financial market, etc. (Akerlof and Yellen, 1987; Shefrin, 2000; Lee and Andrade, 2011). Similarly, that would not be too different in the decision-making of using health care services (Rosentock, 2005).

Relative to our context, the decision of using (or not using) of health care, specifically contraceptive services, according to the Health Belief Model, depends on several factors: Perceived Severity, Perceived Benefits, Perceived Barriers, etc. (Rogers, 1975; Jobs, 1998; Rosentock, 1974; Rosenstock, Strecher and Becker, 1994). Expected Gains or Perceived Benefits for using contraceptives have been extensively studied and are frequently presented in planning policies, in international conferences of population, and so on. However, we ask us, facing the recent rise of not using due to fear of side effects, if it would be important to assess the uncertainty on side

effects, the perceived severity, the perceived losses (caused by "misuse" or even failure or inadequacy of services) by taking into account the context socio-economic uncertainty and the situation of the health system in which this increasing fear is observed?

There are some studies that suggest us that uncertainty on side effects is considerable and socio-economic losses associated with possible side effects would not be negligible. According to Bongaarts and Bruce (1995), few women received information on side effects and fewer one on how manage these side effects. Regarding to the losses, they could range from direct economic costs associated with possible side effects (or complications), which could be quite high, higher than costs of acquisition of contraception itself. Contrary to acquisition cost, generally, the direct cost of complications are not be covered or insured by the system health or the contraception services. In fact, the rate of medical coverage is under 3% in Haiti, 20% in the Dominican Republic and Bolivia 21.53 % (Coa *et al.*, 2009; Cayemites *et al.*, 2007 and Centro de Estudios Sociales y Demográficos et al., 2008). This situation would not be different in most developing countries. In addition, in cases of secret use of contraceptives by married women (or young and unmarried women), they should pay themselves these costs, with discretion, especially if there was a family or partner opposition. To these costs, we could add the potential indirect social and economic costs: break of the union, complicated relation with family, social rejection and the associated economic consequences. Thus, the fear appears like a self-protection (Sugden, 1985; Larrick, 1993; Bongaarts and Bruce, 1990; Sedgh *et al.*, 2007; Bongaarts and Bruce, 1990; Bruce, 1990).

However, too few studies have been conducted in this context to confirm or refute this hypothesis of anticipation of possible losses. Nonetheless, another factor, often mentioned, is the problem of discontinuation of contraception use. Therefore, we wonder if having a bad experience or having at least one relative who has had a bad experience with using of contraception might influence the perception of women about the contraception use and might generate the fear of side effect.

Discontinuation and Consequences: Memory Effect

If the prospective approach (Expected Utility Theory or Perceived Losses and associated probabilities) is often used to understand the decision-maker behavior, the retrospective approach o memory effect can be so useful for a good understanding of the discontinuation of contraceptive and its consequences. According to this approach, having experienced contraception method in the past and the subsequent advantages (and potential "consequences") would be, in large part, determinant of current (or future) decisions and human action. Experience in the past allows us to feel the sensation caused by the success or failure, feel the non-satisfaction and dislikes and to anticipate this feeling in the future. In short terms, a bad experience or live near someone who has had a bad experience with the contraceptive cannot be neutral in behavior (present and future) of women (Becker, 1974, 1988, Rosentock, 1974; Rosenstock, Strecher and Becker, 1994).

Living a bad experience with some medicate would result in dissatisfaction, discontinuation (at least temporarily). If, generally, the objective probabilities to contact some side effects or complications health are very low (when all conditions are fulfilled), the very high rates of discontinuation in developing countries make us doubt about women's experiences with contraception or the quality of contraceptive system. For example, Ethiopia (Africa) has a record rate of discontinuation of 43%, the Dominican Republic (Latin America), a rate of 38% and Indonesia (Asia), 18% (Population Reference Bureau, 2008). This discontinuation is generally higher among women of 15-19 years (Blanc *et al.*, 2010). The main reason advanced by married women with unmet needs to explain their stopping is the side effects and health concerns. Indeed, Latin America and the Caribbean, the percentage of married women with unmet needs who stopped the using of contraception because of the fear of side effects / health concerns varies around 38 to 42%. The same reason of stopping among married women with unmet needs is also prevalent in other developing countries in Asia and Africa (Sedgh *et al.*, 2007). Thus, we question us if the fear of side effect is only individual or subjective problem or a lack of motivation, or if it is other things like as lack of knowledge for good use, lack information on side effects and how to manage it, in others words, bad quality of services in promoting terms or health education, etc. (Bruce, 1990; Bongaarts and Bruce, 1995, Lachaud, 2010).

A bad experience not only implies a discontinuation of contraceptive use, but also, should involve, firstly, an immediate refusal for reusing as Reported by Frost, Finer and Singh (2007), "*Women who are dissatisfied with their method are at high risk for stopping use and is experiencing period of unprotected risk of pregnancy*. P. 80 ". But also, it can affect the decision of women for using another contraceptive method even more effective and more adequate (Rosentock, 2005). And secondly, it should involve a diffusion process by social interactions affecting, primarily, closest people to the person who has experienced this (bad) experience and so on (Montgomery and Caterline, 1996).

Fear of side effects and Unmet need: Social Interactions

We believe the other part to contact fear of side effects is the process of diffusion by interaction between women. This diffusion can be done directly, that is to say in the immediate environment of a woman who experienced it, and indirectly or a wider environment (Baileys, 2008; Montgomery and Caterline, 1996). The position of a woman in one of these different environments would play on her perception of side effects.

One of the main theories developed to understand the adoption of the expansion of contraception in developing countries is the diffusion theory, more precisely the diffusion by Social Interactions (Montgomery and Casterline, 1996). According to this theory, the diffusion is the basis of the acceptation or the refusal of new contraception technologies by women. To understand the process, the authors pointed out two important aspects of the diffusion: Social Learning and Social Influence.

Social Learning, according to Montgomery and Casterline, in uncertainties context, allows women to make some assessment by themselves and between themselves (personal networks), by talking and interacting on new events, new contraceptive technologies but equally by talking about the perceived benefits, perceived severity and potential problem like potential side effects. This process facilitate women to come to some consensual acceptance (or a refusal) face a new situation. Thus, after have experimented side-effects, this experiment would be subject to discussion and interpretation by women, at least among women who are close with those who lived the experience. It is this interpretation which would give

the fear of side effects all its strength or weakness (Montgomery and Casterline, 1996, Bailey and Matthews, 2008).

By Social Influence, the authors highlight the pressures and social norms, institutional and even religious. If social learning is done in a more restricted frame, Social Influence takes into account the overall structural context, institutional frame, legislation, etc., and, therefore, takes longer to change. In most developing or poor countries, institutional structures, especially the institutions of health and contraceptive services are generally low, neglected or limited, poorly distributed geographically, ill-equipped to not let some concerns and fear about their quality, their services and, in some cases, their personal. Bruce (1990) explains that sometimes the providers responsible for giving direct information are ill-equipped for themselves. Not to mention, legal standards that should ensure the quality of these services, the health insurance are almost nonexistent in some countries and in this sense, could enhance the fear of side effects (Heath, Chip and Tversky, Amos Bruce, 1991; Coa *et al.*, 2009; Cayemites *et al.*, 2007; Centro de Estudios Sociales y Demográficos *et al.*, 2008)..

In sum, the different perspectives that we just review suggest us that the fear of side effects may affect the decision-making for contraceptive use. Indeed, weakness of the health system in developing countries, the record rates of discontinuation due to side effects and social interactions can theoretically generate, enhance or contribute to convey the fear of side effects and develop seemingly irrational behavior in women who want to stop childbearing or to postpone a birth. However, we ask ourselves if we can find some empirical evidences of the effect of fear on the use of contraception? At least, if after controlling all other factors, including number of children wanted, this influence would persist?

Thus, the objective of the second part of our paper is to estimate the net effect of the fear of side effects on unmet needs.

Methodological approach

This paper uses the last Demographic Health Surveys (DHS) data collected in Haiti (2005-06), Bolivia (2008) and Dominican Republic (2007). These data were built on large representative samples, 10 757 women for Haiti, 16 939 women in Bolivia and 27 195 women in the Dominican Republic. These surveys are focus on reproductive health, use of health care services, morbidity, and infant and maternal mortality. They provide rich information and questionnaires are standardized. This allows us to make statistical inferences and some comparisons between countries (Coa *et al.*, 2009; Cayemites *et al.*, 2007 and Centro de Estudios Sociales y Demográficos et al., 2008)

The dependent variable of our research is "Unmet needs" in which are included unmet needs for spacing and unmet needs for limiting. It is important to remember by definition and by measure unmet need a situation is contingent on the non-use. That is to mean, to measure if a woman has unmet need or not, it is obligatory to know if this woman does not use any contraceptive method. Thus, at a first time, we are considered only women who do not use any contraceptive method. But, the problem is, the not using is not randomly but systematically selected and can be modeled. Do not consider this selection situation would bias the estimated effect (Lachaud, 2010). For taking into account this selection problem, we are used the Heckman Selection Model (we will be back on it).

The independent variable of interest is “fear of side effects/health concerns” Thus, we considered this variable like a dichotomous variable "fear of side effects/Health concerns" or "not", combining women response to the questions on reasons of not using a contraceptive method: fear of side effect, interference on body and health concern.

We used various control variables such as "socioeconomic status" calculated in the DHS, "educational level of women", "marital status", "age" and "area of residence. To measure the preference of women about family size, we calculated the variable “if a woman had already the number of kids wanted”, differencing the number of kids she has with his ideal number. And, only for Haiti, we added the variable "religion" because it is unavailable in the other two countries.

Model specification

To perform our analysis the selection model Heckman (HeckProbit) with a two-stage procedure was used.

Firstly: We undertook the Selection Model (Probit)

$P(N_i)= W_i\alpha + e_i$

N_i = 1, if the woman does not use any contraceptive method

N_i = 0, otherwise

And secondly, we undertook the Unmet Needs Model (Probit)

$P(Y_i) = X_I\beta + u_i$

$P(Y_i)=P(Y_i)$, if $N_i = 1$;

Si N = 0, there is no observation for Unmet Needs

With:

$P(N_i)$ = probability for a woman i don't use actually any contraceptive method or "Not using", this variable is not observable and "N", dichotomous observable variable.

N_i = 1, the woman i don't use any contraceptive method

W is the Matrix of explicative variables of Prob (N_i)

α: Coefficients Matrix column for Prob (N_i)

ei: Error terms for selection Model

$P(Y_i)$ Probability for a given woman i have unmet needs

β: is the Matrix of explicative coefficients of $P(Y_i)$

ui: Error terms of Unmet Needs model

if the distribution of P(N) is Normal and E(e) = 0 y V(e) = δ_e (E: Esperance and V: Variance)

and

The distribution of Prob(Y) is Normal And E(u) = 0 y V(u) = δ_u

P(N=1 | w) = $\Phi(W'_i\alpha)$, with Φ is the function is the standard normal cumulative distribution

Values are estimated Unmet Needs, with N =1:

$$E(Y_i \mid N=1, x_i) = x'_i\beta + E(u_i \mid N=1)\, x'_i\beta + \mathbf{E}(u_i \mid e_i > W'_i\boldsymbol{\alpha}) \quad (1)$$

$\mathbf{E}(u_i \mid N=1)\, x'_i\beta = 0$ y $E(u_i \mid e_i > W'_i\boldsymbol{\alpha})$ (1) $= \rho\delta_e\delta_u \frac{\varphi(W'i\boldsymbol{\alpha})}{\Phi(W'i\boldsymbol{\alpha})}$ (2), with δ, the variance

and φ density function

And substituting equation (2) in (1), we have:

$$E(Y_i \mid N=1, x_i) = x'_i\beta + \rho\delta_e\delta_u \frac{\varphi(W'i\boldsymbol{\alpha})}{\Phi(W'i\boldsymbol{\alpha})} \quad (3)$$

Here, we have to use a Probit to estímate Unmet Needs:

$$E(Y_i \mid \text{No using}=1, x_i) = x'_i\beta\hat{} + a^{\lambda_i\hat{}}, \quad (4) \quad \text{with } \rho\delta_e\delta_u = a,\ \rho = \text{cov}(u_i, e_i)$$

$$\text{And } \frac{\varphi(W'i\boldsymbol{\alpha})}{\Phi(W'i\boldsymbol{\alpha})} = \lambda_i$$

if $\rho = \text{Cov}(u_i, e_i) = 0$ ==> there is not selection effect.

This model allows us to circumvent the selection problem related to the definition of unmet Need, by modeling in a first step the "not using" and calculating a correction factor of selection bias, and in a second step, by modeling a model unmet Needs using the correction factor. To avoid the problem of correlation between the women of the same household was used clustering technique per household and standard deviations are adjusted to be more robust.

In the following we briefly present some key results of the analysis of different models fitted to the second definition of fear of side effects.

Results

Sociodemographic Profile of female Population

In table 1, we present sociodemographic profile of the women population for Haiti, Dominican Republic and Bolivia. Clearly, in all three countries, women population is relatively young, more than 1 for every for 4 women are between 15-19 years old and more than 1 for every 5 women for Dominican Republic and Bolivia. The average age for these women varies around 28 or 29 years old. Percentages of women who living in union (Married women+ living together) ranges from 57% to 60% in all three countries, but in Dominican Republic, "living together" is preponderant at 41.9%.

A large difference is observed in education terms between Haiti and both others countries. In Haiti, around 1 for every 5 women has no education while less 1 for every 20 women has at least a primary level. In terms of number of kids wanted, in all three countries, more than 67% of women they do not have yet the number of kids wanted. If the parity is already high, this can mean that the level of preference still high in matters of fertility in all three countries. Contrary to Dominican Republic and Bolivia, the women population living in rural area is still important in Haiti (53.5%) and more than 90% of women say they are Catholics and Protestants (Adventists, Witness of Jehovah, etc.).

Table 1. Percentage distribution of Women population of 15-49 years old (in Haiti-2005-06, in Dominican Republic-2007 and in Bolivia-2008)

Variables	Haiti %	Bolivia %	Republic Dominican %
Age			
gr15_19	25.1	20,8	20,5
gr20_24	18.6	16,2	16,6
gr25_29	16.4	16,2	14,6
gr30_34	11.6	13,9	13,9
gr35_39	10.8	12,7	13,4
gr40_44	8.7	10,6	11,6
gr45_49	8.7	9,7	9,4
Mean	28.2	29,5	29,7
Marital Status			
Married women	44.9	37,8	14,8
Living Together	14.4	22,2	41,9
Never married	31.6	31,7	24,0
Widowed/divorced/not living together	9.1	8,3	19,3
Education			
No education	23.2	4,6	3,2
Primary	39.3	41,1	38,2
Secondary and Higher	37.5	54,3	58,5
Number of Kids wanted			
Childbearing preference not reached	73.7	67,2	81,2
Wealth Index			
Poorest women	15.4	15,5	15,7
Poorer women	16.4	17,2	19,2
Middle	18.5	20,6	21,0
Richer and Richest	49.8	46,8	44,1
Religion			
Catholic	49.9	…	…
Protestant/Methodist/Adventist/witness of Jehovah	45.1	…	…
Other	5.0	…	…
Residence Area			
Rural	53.5	34.0	28.2
Urban	46.5	66.0	73.8
N	10757	16939	27195

Sources : Calculated by the author from DHS Haiti (2005-06), Bolivia(2008) and Republic Dominican (2007)

Health Insurance, Contraceptive Use, Unmet Needs and Fear of Side effects

In table 2, we present the using of health services by women population for all three countries. According to the statistics, the percentage of medical coverage is very low in Bolivia, only 1 for every 5 women and quasi don't exist for Haiti (2%). That is to mean, the health system care is very limited and weak, not to mention the quality of its services. The statistics show that the contraceptive use is worst in Haiti. Only 22.9% of women of 15-49 years old are using a contraceptive method while the unmet needs (among women who don't use) are 32.6%. This situation is so critical. In spite of the situation is better in both others countries, the contraceptive use level are still relatively weak, 41.5% in Bolivia and 54.0 in Dominican Republic and, the unmet needs are high, 22.4% in Bolivia and 18.6% in Dominican Republic.

Regarding to the fear of side effects among women with unmet needs, in Haiti the situation is still worst. More than 41% of women with unmet needs are fear of side effects. But, the situation is also critical in both others countries where 16.6% (in Bolivia) and 17.9% (in Dominican Republic) of women with unmet needs are fear.

Table 2. Use, need and Health Insurance

Variables	Haiti %	Bolivia %	Republic Dominican %
Covered by Health insurance	2.0	21.5	…
Contraceptive use	22.9	41.4	54.0
Unmet needs (among women who don't use)	32.6	22.4	18.6
Fear among women who don't use	19.9	5.9	4.4
Fear among women with unmet needs	41.3	16.6	17.9
N	10757	16939	27195

Sources : Calculated by the author from DHS Haiti (2005-06), Bolivia(2008) and Republic Dominican (2007)

Heckman Selection Model

We conducted a Heckman selection analysis on unmet of all women population of 15-49 years for all three countries. The multivariate concentrates on the impacts of fear of side effects on the unmet needs, controlling for age, marital status, education level, residence area, if the number of kids wanted is reached and religion We undertook the selection model and test it. All analysis are pondered and clustered by household. Analysis highlights very interesting results.

Selection Effect

The results show an important problem of methodology if we did not take into account the selection effect. In fact, in all three countries, table 3 (in annex) shows the covariate of error terms of selection model and unmet needs are statistically different of cero (significant at 1%). That is to mean not consider this selection in modeling unmet needs would bias statistically the results. Additionally, factors that affect probability of "not using" can affect indirectly unmet needs, like the variable education level that affect only indirectly the unmet in Haiti and Dominican Republic by affecting the not using.

Fear of Side Effects Impacts

Table 3 (in annex) shows strong evidence of fear of side effects impacts on unmet needs in all three countries. In all models fitted, the impact of fear of side effects is significant at 1%. For performing the analysis of the impact, we present in table 4 the average probabilities of having unmet needs and the relative risks.

Controlling all others factors, as it shows in table 4, the fear of side effects is the most important factor explaining the unmet needs in all three countries. The average probability for a woman of 15-49 years old have needs unmet (taking into account the selection effect and all others factors are constant) is 0.163 in Bolivia, 0.315 in Dominican Republic and 0.457 in Haiti. But, in Dominican Republic, the relative risk or the probability for a woman who has fear are three and an half more than probability for a woman who hasn't fear (3.58) while in Haiti, this relative risk is 2.12 and 1.26 in Bolivia. That is to say the impact of side effect is more important more important in Dominican Republic than both others countries.

Table 4: The average probability of a woman who does not use a contraceptive method has unmet needs in all three countries

	Haiti			Bolivia			Dominican Republic		
Variables	Average Prob.	Relatifs Risks	P	Average Prob.	Relatifs Risks	P	Average Prob.	Relatifs Risks	P
Gr15_19	0,258	1		0,131	1		0,093	1	
gr20_24	0,262	1,016		0,103	0,786	***	0,080	0,860	*
gr25_29	0,225	0,872	**	0,090	0,687	***	0,077	0,828	*
gr30_34	0,229	0,888		0,079	0,603	***	0,044	0,473	***
gr35_39	0,231	0,895		0,071	0,542	***	0,035	0,376	***
gr40_44	0,211	0,818	*	0,064	0,489	***	0,032	0,344	***
gr45_49	0,145	0,562	**	0,046	0,351	***	0,028	0,301	***
Married women	0,258	1		0,131	1		0,093	1	
Living Together	0,294	1,140	***	0,130	0,992		0,104	1,118	***
Single	0,056	0,217	***	0,011	0,084	***	0,024	0,258	***
Widowed/divorced/not living together	0,034	0,132	***	0,015	0,115	***	0,050	0,538	***
No education	0,258	1		0,131	1		0,093	1	
Primary	0,256	0,992		0,120	0,916	**	0,084	0,903	
Secondary and Higher	0,241	0,934		0,096	0,733	***	0,086	0,925	
No fear	0,216	1		0,129	1		0,088	1	
Fear	**0,457**	**2,116**	***	**0,163**	**1,264**	***	**0,315**	**3,580**	***
Poorest women	0,258	1		0,131	1		0,093	1	
Poorer women	0,252	0,977		0,098	0,748	***	0,088	0,946	
Middle	0,222	0,860	***	0,089	0,679	***	0,085	0,914	
Richer and Richest	0,220	0,853	***	0,075	0,573	***	0,080	0,860	**
Catholic	0,258	1							
Protestant/Methodist/Adventist/witness of Jehovah	0,259	1,004							
Other	0,284	1,101							
Rural	0,244	1		0,127	1		0,085	1	
Urban	0,276	1,131	**	0,134	1,055		0,100	1,176	**

Sources : DHS : Haiti (2005-06), Bolivia(2008) and Republic Dominican (2007)

Socioeconomic Characteristics Effects

The socioeconomic characteristics show some quite interesting effects on unmet needs. Firstly, we have to highlight that unmet needs is higher among young women of 15-19 years in Dominican Republic and Bolivia, and among 15-19 and 20-24 years in Haiti. That is to say unmet needs are concentrated in young women population in all three countries. However, this age effect is not statistically very significant in Haiti.

Regarding to exposure factors, the trend of parameters estimate for marital status is similar in Haiti and Dominican. Living together (respectively to married women) make increase probabilities for having unmet by 14.0% (0.01) in Haiti and by 11.8% in Dominican Republic (0.01) while being single or widowed /divorced decreases theses probabilities. In all three countries, education level tends to reduce probabilities of having unmet needs but this trend is only significant in Bolivia. However, we have to note that education level impacts indirectly unmet needs in all three countries by affecting the probability of not using (table 3, in annex).

Other variable very interesting is the economic status. In fact, a better economic status reduces probability for having unmet needs in all three countries. However, this reduction is much more important and significant in Bolivia than both others countries.

Finally, we find two surprising results. Firstly, living in an urban area increases the probability for having unmet needs. This result is significant at 5.0% in Haiti and Dominican Republic. That is to say if living in an urban area reinforce the idea of women of these countries on controlling family size and, by the way create the needs of contraception, to satisfy these needs created, it's insufficient. Probably, this could be related to the quality of contraceptive services and not to the accessibility because, generally, all health services are concentrated in urban areas. Secondly, in Haiti, not being Catholic impacts indirectly unmet needs by increasing probabilities of no using (table 3, in annex).

Conclusions

This paper has set out to understand and measure the impact of fear of side effects on unmet needs in three countries in Latin America, Haiti, Bolivia and Dominican Republic. In all three countries, the impacts of side effects on unmet needs are considerable. If ours findings are not uncommon, this paper tried to estimate this effect, controlling all others factors and taking into account the selection effect by modeling contraceptive use. Results show in all three countries the selection effect is so important and, methodologically, it is necessary to consider this problem.

Secondly, we found that the fear of side effects is the most important factor for a good understanding of unmet needs in all three countries. That is to say this fear is one of the most important barrier for contraceptive use, even among women with unmet needs. However, we can say, this fear could be the result of, firstly, memory effects after a bad experience with contraceptive by viewing the record rate of discontinuation contraceptive due to side effects or health concern in Dominican Republic where the impact is also more important. Secondly, that could be or could be completed by interactions social. These interactions social, as explain Montgomery and Casterline (1996), can be explained by social learning and social influence. Both causes of fear of side effect can be explained, at least partially, by the health system limits in improving its quality of services and promoting health education of women.

Thirdly, we found that unmet needs are higher among young women and also among ones who are living in urban areas. Finally, religion affects indirectly unmet needs by impacting on probability for not using. However, further studies are needed to confirm these trends.

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Annex

Table 3: Models Heckman

Dep. variable : Unmet needs Vs No Unmet needs						
	Haiti		Bolivia		Republic Dominican	
Variables	**Coeff.**	**P**	**Coeff.**	**P**	**Coeff.**	**P**
Gr15_19						
gr20_24	0,019		-0,203	***	-0,122	*
gr25_29	-0,168	**	-0,330	***	-0,147	*
gr30_34	-0,137		-0,435	***	-0,528	***
gr35_39	-0,126		-0,506	***	-0,650	***
gr40_44	-0,223	**	-0,565	***	-0,679	***
gr45_49	-0,574	*	-0,758	***	-0,724	***
Married women						
Living Together	0,171	***	-0,008		0,172	***
Single	-1,364	***	-1,558	***	-0,883	***
Widowed/divorced/not living together	-1,508	***	-1,250	***	-0,420	***
No education						
Primary	-0,012		-0,150	**	-0,113	
Secondary and Higher	-0,099		-0,365	***	-0,100	
fear/No fear	0,830	***	0,179	***	0,944	***
Poorest women						
Poorer women	-0,029		-0,268	***	-0,049	
Middle	-0,185	***	-0,354	***	-0,069	
Richer and Richest	-0,270	***	-0,574	***	-0,135	**
Catholic						
Protestant/Methodist/Adventist/witness of Jehovah	0,009		…		…	
Other	0,105		…		…	
Urban	0,127	**	0,037		0,100	**
_cons	-0,185	**	0,132	***	-0,804	***
Selection Model						
No Use/Use	**Coeff.**	**P**	**Coeff.**	**P**	**Coeff.**	**P**
Gr15_19						
gr20_24	-0,266	***	-0,573	***	-0,402	***
gr25_29	-0,288	***	-0,660	***	-0,532	***
gr30_34	-0,244	***	-0,808	***	-0,700	***
gr35_39	-0,165	**	-0,780	***	-0,901	***
gr40_44	-0,117		-0,693	***	-0,910	***
gr45_49	0,081		-0,080		-0,764	***
Married women						
Living Together	-0,044		-0,009		0,034	
Single	0,744	***	1,424	***	1,401	***
Widowed/divorced/not living together	0,817	***	1,092	***	0,563	***
Preference (not reached)	0,393	***	0,105	***	0,485	***
No education						
Primary	-0,132	**	-0,213	***	-0,240	***
Secondary and Higher	-0,385	***	-0,400	***	-0,150	***

(continued on the next page)

Table 2: Selection model (continued from the previous page)

No Use/Use	Coeff.	P	Coeff.	P	Coeff.	P
Poorest women						
Poorer women	-0,239	***	-0,196	***	-0,110	***
Middle	-0,407	***	-0,371	***	-0,132	***
Richer and Richest	-0,518	***	-0,518	***	-0,124	***
Catholic						
Protestant/Methodist/Adventist/witness of Jehovah	0,142	***	…		…	
Others	0,145	*	…		…	
Urban	0,113	**	0,033		0,064	**
_cons	0,833		0,854	***	-0,144	*
Athrho	1,078	***	2,749	***	1,232	***
Wald test of indep, Eqns (rho=0)		***		***		***

Sources : DHS : Haiti (2005-06), Bolivia(2008) and Republic Dominican (2007)
P Significant levels : *** 1%, ** 5% and * 10%