Reproductive health preventive behavior among the female indigenous population of Latin America

Edith Alejandra Pantelides

Principal researcher, Consejo Nacional de Investigaciones Científicas y Técnicas (CONICET), and Centro de Estudios de Población (CENEP), eap@cenep.org.ar

Silvia Mario

Researcher, Instituto de Investigaciones Gino Germani, Facultad de Ciencias Sociales, Universidad de Buenos Aires, silviamario@gmail.com

Paper presented to the XXVI IUSSP International Population Conference
Marrakech, 2009

Introduction

The purpose of this paper is to show the reproductive health prevention situation of the indigenous female population in childbearing ages vis a vis their non-indigenous peers among the urban and rural female population, and among its poorest and less educated segments. The objective is to elicit how much of the indigenous women's situation in reproductive health prevention is related to their ethnicity and how much to the fact of living in rural areas, being poor, uneducated or poorly educated.

We are proposing to look at different aspects of prevention in reproductive health: prevention of unplanned pregnancies, of HIV transmission and of maternal morbidity and mortality. For the first two aspects we will analyze the possession of knowledge that enables effective preventive practices. The possession of cognitive resources, although does not in itself determine behavior, is undoubtedly a condition for the exercise of practices that are in effect preventive.[1] Cognitive resources are not distributed evenly throughout society and when the dispossessed segments of it do not have access to such resources a factor of vulnerability[2] is added to their already vulnerable situation (Palomo Sánchez, 2003). Regarding the prevention of unplanned pregnancies we will also look at different measures of contraceptive use but we will further concentrate in the analysis of factors related to current modern contraceptive use.

Access to health services establishes limits to the ability of exercising practices that would help prevent maternal and child morbidity and mortality. The organization of the health services, their location, and cost generate concrete barriers, but it is also a barrier the existence of discriminatory treatment of indigenous women by health personnel (Seiber and Bertrand, 2002; Del Pópolo and Oyarce, 2005). With regards the prevention of maternal morbidity and mortality, we choose to analyze different aspects of antenatal care and safe delivery, one of which, adequate number of antenatal controls, was selected as the dependent variable for the multivariate analysis.

The indigenous population is in many countries of Latin America among the more disadvantaged segments of the population. It is enormously diverse, composed of many different ethnic groups with their characteristic cultures, including differing languages. Some of they live in easily identifiable areas while others have migrated to the cities and are at different stages of cultural assimilation. Their fertility is generally higher, and their health indicators are worse that those of the non-indigenous population of the same country or region.

Defining who is a member of the indigenous population and who is not is a difficult task faced by all who attempt to collect or use data that discriminate between the indigenous and the non-indigenous population (Bodnar, 1999; Peralta Catalán, 2003; Peyser and Chackiel, 1999; Terborgh et al, 1996) (see more in the section on

---

[1] Results form research conducted in rural Guatemala, for example, show that "contraceptive knowledge is by far the most significant predictor of contraceptive use" (Lindstrom and Muñoz-Franco, 2005: 284).

[2] We use the concept of vulnerability in a loose way. The concept is complex and it has been and it is still being discussed (Sen, 1981; Moser, 1997; Katzman et al., 1999). It has been generally defined as the availability to the individual of material (housing, machinery, transportation jeans, etc.) and financial resources, of human capital (education, health), and of social capital (reciprocity networks, access to information).

methodology). In this paper we have to adopt the criteria used in the secondary data we use in the analysis.

Methodology and sources of data

Two approaches are used for the analysis of data. The first one is a descriptive comparison between indigenous and non-indigenous women along the variables of interest. The second approach is a multivariate analysis to elicit the relative importance of the population characteristics (area of residence, economic situation, educational level) in the differences found between the indigenous women and their non-indigenous peers. We first present some three-variable cross tabulations and finally two multivariate models.

A note of caution is necessary. The definition of "indigenous population" to be used here is per force that used in the sources. We are aware of the difficulties in capturing the indigenous population and of the different ways used to do it (self-identification, language, dress, observation by the interviewer, etc.). We are also aware that in each country different cultures will be subsumed under the denomination "indigenous". Since our focus is on the comparison between indigenous and non-indigenous women in childbearing ages within each country the methodological problem – to which there are no solutions at this stage- is restricted to the inter-country comparison.

Sources of data are DHS and similar surveys taken from 2000 onwards representative of the female population in childbearing ages of Bolivia, Guatemala, Mexico, and Peru, countries where the indigenous population was identified in the surveys and where its numbers in the sample allowed for the application of multivariate analysis.

The following are the surveys used:
Encuesta Nacional de Demografía y Salud, Bolivia, 2003.
Encuesta Nacional de Salud Materno Infantil, Guatemala, 2002.
Encuesta Nacional de Salud Reproductiva, México, 2003.
Encuesta Demográfica y de Salud Familiar, Perú, 2004

Description of the samples

Although all the countries selected for the analysis have a sizeable indigenous population, their weight in the total population is very different as shown in Table 1.

Table 1. Bolivia, Guatemala, Mexico and Peru. Women 15-49 years old. Sample size and percentage of indigenous population in the sample

Country and year of survey	Sample size (females 15-49)	% indigenous In the sample
Bolivia (2003)	17638	54.3
Guatemala (2002)	9155	41.9
Mexico (2003)	19498	10.7
Peru (2004)	6251	13.6

The age structure of the samples calls our attention: in all except the one for Guatemala the non-indigenous female population is as young as or somewhat younger than the indigenous (Table 2), which is unexpected given the higher fertility of the latter. However, census data show that, for example, the weight of women 15-19 years old is in fact similar among indigenous and non indigenous females in Guatemala and Mexico (around 10.5% in both countries) mirroring what happens in the samples. The Bolivian sample seems to be biased since, according to the census, the indigenous 15-19 years old women weight less than the non-indigenous women (12.2% for indigenous and 9.4% for non-indigenous)[3] (www.cepal.cl/celade). Different definitions of "indigenous" may be part of the explanation of the survey-census differences.

Table 2. Bolivia, Guatemala, Mexico and Peru. Women 15-49 years old. Age structure and percentage of sexually initiated and of sexually active.

Age groups	Bolivia		Guatemala	
	Indigenous	Non indigenous	Indigenous	Non indigenous
15-19	19.2	25.0	18.3	16.9
20-29	32.7	33.6	37.9	36.4
30-39	27.2	24.9	27.5	28.0
40-49	20.9	16.5	16.3	18.7
Total	100.0	100.0	100.0	100.0
n	9570	8068	3839	5316
Sexually initiated	79.4	82.2	82.6	81.8
Sexually active within last four weeks	59.8	61.3	74.7	75.2
	Mexico		Peru	
	Indigenous	Non indigenous	Indigenous	Non indigenous
15-19	18.7	20.0	18.6	19.6
20-29	32.6	32.0	26.1	31.7
30-39	27.8	27.8	30.5	27.7
40-49	20.9	20.2	24.8	21.0
Total	100.0	100.0	100.0	100.0
n	2087	17411	853	5398
Sexually initiated	76.5	74.3	83.9	76.4
Sexually active within last four weeks	59.8	72.6	69.6	66.2

Other characteristics of interest are the percentage of women sexually initiated and the percentage sexually active in the four weeks preceding the survey. Except in Peru, where the percentage of sexually initiated is higher among the indigenous women, in the other three countries the differences between the two sub-populations are small and in different directions. Regarding the sexually active, the exception is now Mexico, with higher percentages of non-indigenous than indigenous women that are sexually active, while there are only small differences in the other three countries.

According to the 2000 round of censuses 53.4% of the indigenous population in Bolivia, 32.0% in Guatemala, and 35.8% in Mexico leave in urban areas (Del Popolo, Oyarce and Ribotta (2009). However, the indigenous population resides in rural areas

---

[3] Data for Peru not available.

en higher proportion than the non-indigenous, with very large differences registered in Mexico and Peru. Other selected socio-economic characteristics show that they are in average poorer, live in worse housing conditions and have lower educational attainment than non-indigenous women in the countries under study. The smaller relative differences between the two sub-populations are seen in Bolivia (Table 3).

Table 3. Bolivia, Guatemala, Mexico and Peru. Women 15-49 years old. Socio-demographic characteristics

Selected characteristics	Bolivia (2003)		Guatemala (2002)	
	Indigenous	Non indigenous	Indigenous	Non indigenous
Rural residence	39.7	27.8	76.7	59.3
Water supplied piped into dwelling	18.9	30.1	*11.1	*37.4
Earth as main floor material	30.3	24.2	67.5	32.4
Educational attainment up to incomplete primary	53.4	36.8	85.4	54.8
Poorest household**	17.8	11.4	42.8	22.1
	Mexico (2003)		Peru (2004)	
Rural residence	60.3	22.0	94.0	27.8
Water supplied piped into dwelling	24.6	67.7	40.8	66.6
Earth as main floor material	50.0	12.0	81.7	30.0
Educational attainment up to incomplete primary	43.2	19.7	62.0	19.3
Poorest household**	***41.9	14.0	n/a	n/a

Note: * In Guatemala the percentages are of houses with private toilet facilities. The data are not exactly comparable with those of the other countries.

    ** The variables used to measure poverty are not the same in each survey. In some cases a set of variables is combined to obtain a wealth index, in others only income data is used to stratify the households. We have chosen in all surveys the lowest category.

    *** In Mexico 15% of households do not have data on income.

Knowledge related to preventive behavior

To effectively prevent the occurrence of unplanned pregnancies, some basic knowledge is needed: about the ovulatory cycle if the decision is to use a "natural" method based on the knowledge or detection of that cycle, and about the existence of mechanical or hormonal methods otherwise. The question used to elicit knowledge about the ovulatory cycle was not the same in all surveys. In Bolivia, Guatemala and Peru the question was similar[4] but in Bolivia the alternative answers were read to the interviewee. In Mexico the question was posed only to women that knew about the existence of periodic abstinence contraceptive methods. The level of such knowledge is not widespread in any of the four countries. It reaches a maximum of 3/5 of the non-indigenous female population in Mexico and a minimum among the indigenous women of Guatemala (8.5%). In all countries knowledge of the ovulatory cycle is less frequent among the indigenous sub-population with larger differences in Guatemala and Peru than in Bolivia and Mexico. Knowledge of at least one contraceptive method[5] is high in

---

[4] The question "In your opinion, which are those days?" was asked to all women that answered positively to a previous question regarding the knowledge of the existence of days in between menstruations in which a woman could more easily become pregnant if she had sexual intercourse (our translation).

[5] Includes all methods, regardless of their efficacy.

all four countries, although less among the indigenous women. The differences however, are not large especially in Bolivia and Peru (Table 4).

Table 4. Bolivia, Guatemala, Mexico and Peru. Women 15-49 years old. Knowledge useful for preventive behavior in sexual and reproductive health

Knowledge useful for preventive behavior	Bolivia (2003)		Guatemala (2002)	
	Indigenous	Non indigenous	Indigenous	Non indigenous
Knowledge of ovulatory cycle	34.7	43.4	8.5	22.7
Knowledge of any contraceptive method	91.0	97.5	81.8	97.1
Ever heard of AIDS	69.5	86.0	62.4	93.7
Knowledge of any way to avoid AIDS	52.3	72.1	50.0	85.6
Use of condoms as a way to avoid AIDS	30.6	50.5	14.8	41.8
	Mexico (2003)		Peru (2004)	
Knowledge of ovulatory cycle	14.8	32.9	15.1	38.9
Knowledge of any contraceptive method	85.5	97.5	94.5	99.5
Ever heard of AIDS	75.5	97.0	46.2	95.1
Knowledge of any way to avoid AIDS	59.0	88.1	24.3	85.1
Use of condoms as a way to avoid AIDS	35.1	63.2	4.7	40.8

To prevent the transmission of the HIV, people should have heard about AIDS, know how to avoid it and know that condoms are a way to avoid transmission. Although there are other ways of transmission, unprotected heterosexual sexual contact is the more frequent when it comes to women and condoms are the only way of protection available.

Having heard about AIDS is far more frequent among the non-indigenous women of the four countries (most of which had heard about the disease); the differences with the indigenous population are large in all of them but even more so in Peru. Differences of the same sign and also very large are found regarding knowing of any way to avoid AIDS[6] and knowing that the use of condoms prevents transmission of the virus. The latter type of knowledge is present in about 1/3 of indigenous women of Bolivia and Mexico and is practically absent among their peers of Guatemala and Peru (Table 4).

Preventive behavior

Even if women have the needed cognitive resources, the lack of economic resources, the absence of health services, or health services that build economic bureaucratic or symbolic barriers, including discriminatory practices, may be insurmountable obstacles to women's access to the health system or to other institutions that provide the means to exercise preventive care. Some of these barriers are especially salient for the indigenous population who tends to be poorer, less educated, and to live in rural areas, as we have shown. Additionally they may face linguistic and social barriers and may have to overcome the mistrust of things foreign to their culture, or to methods they find unnatural or damaging to their health (Cospín and Vernon, 1998; De Broe *et al*, 2005; Metz, 2001 cited by De Broe *et al*, 2005; Ward, Bertrand and Puac, 1992).

---

[6] Includes all ways, regardless of their efficacy.

Having shown the degree to which indigenous and non-indigenous women differ in relation to the basic knowledge needed to exercise prevention, we will now explore the actual preventive practices of both populations. We will analyze

a) Practices to prevent unplanned pregnancies (use of contraceptives).

b) Access to pre-natal care (number of pre-natal controls and gestational age at first control)

c) Access to safe delivery (delivery in a health facility)

a) Prevention of unplanned pregnancies: use of contraceptive methods

In all four countries higher proportions of indigenous than non-indigenous women never used a contraceptive method. The largest relative differences between the two sub-populations are found in Mexico and Peru, the countries where the percentage of never users in the female population is the lowest. The highest value of never users is found among the indigenous women of Guatemala where 70% fall in that category[7]. (Table 5).

Table 5 . Bolivia, Guatemala, Mexico and Peru. Sexually initiated women 15-49 years old. Use of contraceptive methods

Use of contraceptive methods	Bolivia (2003)		Guatemala (2002)	
	Indigenous	Non indigenous	Indigenous	Non indigenous
Never used a contraceptive method	32.1	19.2	69.9	36.3
Ever used a modern contraceptive method	45.0	68.0	21.0	56.7
Currently using any method	46.3	55.2	21.7	44.9
Current users of contraceptive methods				
Currently using a modern method	53.1	67.7	67.0	83.6
	Mexico (2003)		Peru (2004)	
Never used a contraceptive method	30.3	13.5	18.7	7.8
Ever used a modern contraceptive method	50.8	56.2	49.2	79.6
Currently using any method	50.4	65.1	51.4	60.4
Current users of contraceptive methods				
Currently using a modern method	86.0	89.0	41.6	69.0

Note: Modern contraceptive methods include condoms, hormonal, IUD, and female and male sterilization.

The higher contraceptive use prevalence among non-indigenous compared to indigenous women is also shown in relation to the questions that elicit ever use of a modern contraceptive and current use of any method.

Regarding current use of a modern method, although the trend of larger prevalence among the non-indigenous is maintained we find a noteworthy exception in Mexico. A very large proportion (exceeding 85%) of current users is using a modern method, and there is almost no difference in that respect between indigenous and non-indigenous women. This exception may be explained by the important role played by

---

[7] Includes all methods, regardless of their efficacy.

the State and its Social Security System since the 1980s in community based family planning programs (Barber, 2007:6) and the introduction of health services in areas of indigenous population (Fernández Ham, 2003: 18). That this explanation is the correct one is further proved by the fact that the most widely used modern contraceptive method is female sterilization.

b) Access to antenatal care and safe delivery

We consider here antenatal care and delivery in a health facility as preventive measures in relation to women's general health and reproductive health in particular. The practice of antenatal care (visits to control mother's and fetus' health) and delivery in a health facility (as an indicator of professional care and hygienic conditions) goes a long way towards insuring a safe delivery with no damaging effects on either mother or child. Indigenous woman generally have higher maternal mortality than non-indigenous ones. A study in México, for example, finds out in four States of Mexico (Chiapas, Guerrero, Hidalgo and Oaxaca) that in 1998 the maternal mortality rate of the indigenous women was from 1.8 to 5.5 higher than the country's average (Palomo Sánchez, 2003: 90).

Access to antenatal care and professionally cared delivery does not depend only of the woman's decision but, sometimes decisively, from the availability of health services. It is not clear, however, what dimensions of "availability" are crucial. That proximity of health services does not explain their use during pregnancy in rural Guatemala was found by Glei, Goldman and Rodriguez (2003). Women gave as reasons for low utilization "fear of treatments, perceptions of poor quality of care, limited hours of service, greater confidence in midwifes, and lack of confidence in biomedical services (Hurtado and Sáenz de Tejada, 2001, cited by Glei, Goldman and Rodriguez, 2003: 2459). Belonging to an ethnic group may add problems of access to the services beyond those posed by their physical or economic unavailability , when "it means sharing a world vision that structures the knowledge of the pregnant women about health and illness in a way that estranges them from the institutional health system" [8](Freyermuth, 2003: 10).

---

[8] Our translation.

Table 6. Bolivia, Guatemala, Mexico and Peru. Women 15-49 years old who gave birth in the last five years. Antenatal visits (number and timing) and place of delivery for the last born child

Antenatal care and delivery of the last born child	Bolivia (2003)		Guatemala (2002)	
	Indigenous	Non indigenous	Indigenous	Non indigenous
4+ antenatal visits	54.2	70.8	59.7	74.5
First antenatal visit in 1st trimester	63.8	67.0	48.7	68.6
Delivered in health facility	55.7	78.8	18.0	53.6
	Mexico (2003)		Peru (2004)	
4+ antenatal visits	70.3	85.3	80.5	86.0
First antenatal visit in 1st trimester	62.2	77.3	64.7	73.1
Delivered in health facility	56.6	90.1	29.6	75.6

Indigenous women in all four countries studied have a smaller probability than non-indigenous women of having an adequate number of antenatal visits, of having the first antenatal visit early in their pregnancy and of delivering in a health facility (Table 6). Similar differences between indigenous and non-indigenous pregnant women was found by Glei, Goldman and Rodríguez (2003: 2449) in rural Guatemala which they attribute (citing previous research) to condescending or discriminatory medical staff who generally do not speak an indigenous language.

Residence or ethnicity?

In this section we will try to elucidate if the disadvantageous situation of indigenous women shown above is due to their ethnicity or to being mainly a rural population, with less access to information and to health resources. For that purpose we compare the indigenous and non indigenous rural and urban women.

Table 7. Bolivia, Guatemala, Mexico and Peru. Women 15-49 years old by place of residence. Knowledge useful for preventive behavior in sexual and reproductive health

Knowledge useful for preventive behavior	Bolivia (2003)			
	Indigenous		Non indigenous	
	Urban	Rural	Urban	Rural
Knowledge of ovulatory cycle	41.4	24.4	47.9	31.5
Knowledge of any contraceptive method	95.8	83.6	98.7	94.5
Ever heard of AIDS	84.2	47.1	92.6	69.1
Knowledge of any way to avoid AIDS	70.5	30.3	82.8	52.2
Use of condoms as a way to avoid AIDS	42.5	12.4	58.0	31.0
	Guatemala (2002)			
Knowledge of ovulatory cycle	11.3	7.7	29.7	17.9
Knowledge of any contraceptive method	89.9	79.4	98.2	96.3
Ever heard of AIDS	81.6	55.9	96.9	90.7
Knowledge of any way to avoid AIDS	86.2	87.9	95.6	89.4
Use of condoms as a way to avoid AIDS	14.4	5.3	46.1	28.0
	Mexico (2003)			
Knowledge of ovulatory cycle	22.2	9.9	36.6	19.6
Knowledge of any contraceptive method	89.5	82.8	98.3	94.5
Ever heard of AIDS	85.5	68.9	98.1	93.2
Knowledge of any way to avoid AIDS	70.9	51.1	90.8	86.0
Use of condoms as a way to avoid AIDS	43.5	29.6	67.0	49.7
	Peru (2004)			
Knowledge of ovulatory cycle	*	14.0	42.3	29.9
Knowledge of any contraceptive method	*	94.1	99.8	98.8
Ever heard of AIDS	*	44.9	98.6	86.1
Knowledge of any way to avoid AIDS	*	23.6	92.8	65.0
Use of condoms as a way to avoid AIDS	*	4.7	48.0	22.2

Note: * Insufficient number of cases.

The data in table 7 show that, regardless of their place of residence, a lower proportion of indigenous that non indigenous women know about different subjects related to the prevention of unplanned pregnancies and the transmission of AIDS. In some variables, the more knowledgeable women are the non-indigenous residing in urban areas, followed by the non-indigenous from rural areas, the urban indigenous and lastly the rural indigenous. In others, however, the sequence is: urban non indigenous, urban indigenous, rural non-indigenous, rural indigenous. There is an influence of residence, but also an influence of ethnicity but not in an uniform manner. There are two different patterns. One appears in Bolivia, where being urban gives advantages regarding knowledge useful for the prevention of unplanned pregnancies and HIV transmission, regardless of ethnicity; the other in Guatemala and Mexico, where being non-indigenous is more advantageous, regardless of place of residence. In Peru, where only the comparison between rural populations is possible, non indigenous women show higher percentages in all categories although regarding knowledge of any contraceptive method (where folk methods are included) the differences are small.

Table 8 . Bolivia, Guatemala, Mexico and Peru. Women 15-49 years old by place of residence. Use of contraceptive methods

Use of contraceptive methods	Bolivia (2003)			
	Indigenous		Non indigenous	
	Urban	Rural	Urban	Rural
Sexually initiated women				
Never used a contraceptive method	54.5	62.6	45.8	48.1
Ever used a modern contraceptive method	52.6	34.1	71.8	59.3
Currently using any method	50.6	40.2	57.4	50.1
Users of contraceptive methods				
Currently using a modern method	56.2	47.4	73.4	74.1
	Guatemala (2002)			
Sexually initiated women				
Never used a contraceptive method	55.8	73.9	24.3	44.0
Ever used a modern contraceptive method	34.5	17.0	69.5	48.5
Currently using any method	31.5	18.9	54.7	38.6
Users of contraceptive methods				
Currently using a modern method	70.6	65.3	86.5	80.9
	Mexico (2003)			
Sexually initiated women				
Never used a contraceptive method	23.7	34.3	11.1	22.1
Ever used a modern contraceptive method	50.5	51.0	55.5	58.6
Currently using any method	57.6	46.2	67.2	57.9
Users of contraceptive methods				
Currently using a modern method	85.1	87.0	89.0	89.8
	Peru (2004)			
Sexually initiated women	*	19.6	6.4	11.1
Never used a contraceptive method	*	48.9	83.4	70.5
Ever used a modern contraceptive method	*	50.2	61.3	58.3
Currently using any method				
Users of contraceptive methods	*	42.0	72.7	60.1
Currently using a modern method				

Note: * Insufficient number of cases.

A larger proportion of indigenous than non-indigenous women, in all four countries, regardless of place of residence, never used a contraceptive method. The opposite is true regarding ever use of a modern contraceptive method, current use of any method and current use of a modern method, although in this last case, the differences found in Mexico are very small (Table 8). In general the urban non-indigenous women show better indicators of contraceptive use, followed by the rural non-indigenous, the urban indigenous and lastly the rural indigenous. But there are some exceptions, the most notable in Mexico in relation with the current use of a modern contraceptive, where the proportion users are very similar among the four categories of women, that is to say, there is no clear disadvantage in either being indigenous or residing in a rural area. The explanation that applies is the same given for Table 5.

Table 9 . Bolivia, Guatemala, Mexico and Peru. Women 15-49 years old who gave birth within the last 5 years by place of residence. Antenatal care and delivery of the last born child

Antenatal care and delivery of the last born child	Bolivia (2003)			
	Indigenous		Non indigenous	
	Urban	Rural	Urban	Rural
4+ antenatal visits	64.8	42.5	77.1	59.1
First antenatal visit in 1st trimester	66.6	60.0	71.1	58.5
Delivered in health facility	73.7	35.8	89.4	59.1
	Guatemala (2002)			
4+ antenatal visits	66.0	58.1	82.8	70.2
First antenatal visit in 1st trimester	56.5	46.7	77.2	63.7
Delivered in health facility	37.2	13.3	76.9	41.5
	Mexico (2003)			
4+ antenatal visits	73.3	69.0	87.6	78.9
First antenatal visit in 1st trimester	66.1	60.5	79.7	70.0
Delivered in health facility	79.4	46.7	94.4	78.8
	Peru (2004)			
4+ antenatal visits	*	80.8	91.1	77.1
First antenatal visit in 1st trimester	*	64.6	76.2	67.3
Delivered in health facility	*	29.4	89.0	52.4

Note: * Insufficient number of cases.

Regarding antenatal care and delivery, again the indigenous women show a disadvantageous situation with respect to the non-indigenous population regardless of their place of residence: They are less likely to have had at least 4 antenatal visits, to have the first antenatal visit in the first trimester and to have delivered in a health facility. In this case the two different patterns found regarding knowledge (table 7) are again found: in Bolivia, being urban gives advantages regarding antenatal care and delivery, regardless of ethnicity; in Guatemala and Mexico, being non-indigenous is more advantageous, regardless of place of residence. (Table 9).

Education or ethnicity?

The effects of educational level and ethnicity differ according to the country and to the variable involved. In Bolivia it is clear that whatever the variable considered, having a higher educational level gives an advantage regarding knowledge useful for prevention, but that within each educational level, being non-indigenous is better. In the other countries the situation is more varied, but whatever the country –including Bolivia- the women that have less knowledge are indigenous with only up to incomplete primary education and those that have more knowledge are the non indigenous women with more than primary education (Table 10).

Table 10. Bolivia, Guatemala, Mexico and Peru. Women 15-49 years old by educational level. Knowledge useful for preventive behavior in sexual and reproductive health

Selected characteristics	Bolivia (2003)			
	Indigenous		Non indigenous	
	Up to primary incomplete	Primary complete and higher	Up to primary incomplete	Primary complete and higher
Knowledge of ovulatory cycle	21.6	49.3	27.6	52.5
Knowledge of any contraceptive method	85.3	97.4	94.8	99.2
Ever heard of AIDS	49.8	92.1	69.0	96.0
Knowledge of ways to avoid AIDS	30.1	82.5	49.7	88.6
Use of condoms as a way to avoid AIDS	11.4	52.6	28.3	63.4
	Guatemala (2002)			
Knowledge of ovulatory cycle	6.4	21.0	13.4	34.0
Knowledge of any contraceptive method	79.7	94.0	95.4	99.0
Ever heard of AIDS	57.3	92.3	89.6	98.7
Knowledge of ways to avoid AIDS	86.9	91.5	87.8	97.0
Use of condoms as a way to avoid AIDS	4.4	24.7	24.0	49.2
	Mexico (2003)			
Knowledge of ovulatory cycle	7.5	20.3	15.5	37.2
Knowledge of any contraceptive method	78.7	90.6	93.4	98.5
Ever heard of AIDS	58.3	88.7	91.7	98.4
Knowledge of ways to avoid AIDS	38.8	74.4	71.5	92.3
Use of condoms as a way to avoid AIDS	17.7	48.4	38.9	69.2
	Peru (2004)			
Knowledge of ovulatory cycle	11.2	21.6	21.6	43.0
Knowledge of any contraceptive method	93.6	96.0	98.6	99.7
Ever heard of AIDS	36.1	62.8	83.0	98.0
Knowledge of ways to avoid AIDS	14.7	39.8	57.3	91.7
Use of condoms as a way to avoid AIDS	1.3	10.2	16.1	46.8

Looking at the relative influence of education and ethnicity on the use of contraceptives it is clear that in general use, measured in different forms, is more prevalent among the non-indigenous women that have at least complete primary education and is less prevalent among the indigenous women with incomplete primary education or less. There are however, some exceptions: in Guatemala, the values for non-indigenous with lower education and indigenous with higher education are similar regarding never use of any method and currently using a method; the same happens in Bolivia with regards the latter variable. In Mexico the difference by ethnicity or education among current users of a modern method are again very small (Table 11).

Table 11. Bolivia, Guatemala, Mexico and Peru. Sexually initiated women 15-49 years old by educational level. Use of contraceptive methods

Selected characteristics	Bolivia (2003)			
	Indigenous		Non indigenous	
	Up to primary incomplete	Primary complete and higher	Up to primary incomplete	Primary complete and higher
Never used a contraceptive method	39.7	20.2	26.5	13.9
Ever used a modern contraceptive method	36.8	57.7	60.5	73.5
Currently using any method	41.9	53.2	51.2	58.1
Users of contraceptive methods				
Currently using modern method	49.9	57.1	74.5	72.8
	Guatemala (2002)			
Never used a contraceptive method	27.4	53.8	54.1	78.5
Ever used a modern contraceptive method	19.1	37.5	47.3	71.1
Currently using any method	20.0	36.3	37.6	56.0
Users of contraceptive methods				
Currently using modern method	67.0	66.9	83.5	83.6
	Mexico (2003)			
Never used a contraceptive method	36.4	24.2	20.7	11.3
Ever used a modern contraceptive method	56.6	69.1	74.3	84.0
Currently using any method	44.3	56.7	61.1	66.4
Users of contraceptive methods				
Currently using modern method	87.0	85.5	89.7	89.0
	Peru (2004)			
Never used a contraceptive method	17.7	20.9	12.3	6.4
Ever used a modern contraceptive method	48.5	50.7	70.4	82.4
Currently using any method	52.3	49.3	59.1	60.9
Users of contraceptive methods				
Currently using modern method	39.7	45.9	60.7	71.6

In both Bolivia and Guatemala non-indigenous women with at least complete primary education have the highest probability of having had four or more antenatal visits, the first antenatal visit in the first trimester of pregnancy and the delivery of their last born child in a health facility. They are followed by indigenous women with the same educational level, non-indigenous women with low education and indigenous women with low education. In the other two countries the sequence may vary, but always the higher percentages in all variables are those of the non-indigenous women with higher education while the indigenous women with lower education have always the lower percentages (Table 12).

Table 12 . Bolivia, Guatemala, Mexico and Peru. Women 15-49 years old who gave birth within the last 5 years, by educational level. Antenatal care and delivery of the last born child

Antenatal care and delivery of the last born child	Bolivia (2003)			
	Indigenous		Non indigenous	
	Up to primary incomplete	Primary complete and higher	Up to primary incomplete	Primary complete and higher
4+ antenatal visits	43.0	76.3	57.9	82.2
First antenatal visit in 1st trimester	60.2	69.2	60.8	71.6
Delivered in health facility	43.1	83.2	65.5	92.2
	Guatemala (2002)			
4+ antenatal visits	58.4	72.1	66.5	88.4
First antenatal visit in 1st trimester	47.3	62.2	60.5	80.9
Delivered in health facility	15.5	43.2	39.5	78.1
	Mexico (2003)			
4+ antenatal visits	62.8	77.5	73.3	88.5
First antenatal visit in 1st trimester	57.5	66.7	65.4	80.3
Delivered in health facility	44.3	68.1	74.0	94.4
	Peru (2004)			
4+ antenatal visits	80.0	82.1	70.4	90.3
First antenatal visit in 1st trimester	64.7	64.7	68.8	74.2
Delivered in health facility	23.5	39.8	48.2	83.3

Similar results were found when indigenous and non-indigenous women of the poorest strata were compared (data not show here).

Conclusions

The previous analysis allowed us to identify the existence of an ethnicity effect on reproductive health related knowledge and preventive behavior. We have also shown that other socioeconomic conditions such as poverty, low educational level and rural residence negatively affect all women. Given that indigenous women are more likely to be undereducated, poor and to live in rural areas, they might be at a further disadvantage.

Logistic regressions were used to quantify the effect of ethnicity on current use of modern contraceptive method (MCM) and adequacy of antenatal care controlling for rural residence, poverty, low education and currently married status. The study focused on two main dichotomous outcomes: The first was a variable indicating use of any modern contraceptive method (condoms, the pill, an IUD, an injectable or female/male sterilization). The second main outcome was a variable indicating the number of appropriate antenatal controls (4 and over) being made during the pregnancy of the last children born (within a five year period previous to the survey).

Two models were tested, the first one without interaction among the independent variables, the second one considering the mixed effect of being indigenous and living in rural areas, being poor and low educated.

As expected across the countries, the odds of contraceptive use were negatively associated with all the independent variables except for being currently married.

The logistic regressions in model 1 show that, among the variables that negatively influence modern contraceptive use ethnicity is the stronger predictor. This relationship is more evident in Guatemala (OR 0.354), followed by Bolivia (OR 0.477) and Peru (OR 0.503) and weaker in Mexico (OR 0.627). Depending on the country, the explanatory power of the remaining variables is different: In Mexico, the odds of using MCM are the lowest for low educated women, while in Peru, residing in rural areas is a more important factor (Tables A1, A3; A5 and A7).

The negative effect of being indigenous in the use of modern contraceptive methods is worsened when another negative factor is taken into account, such as low education or rural residence. Logistic regressions (Model 2) show that the interaction among these variables is not always statistically significant across the countries, but an additional negative effect that reinforces the inverse relationship between the ethnic condition and the use of MCM can be observed in the cases of Bolivia (with respect to the rural residence and the education), Guatemala (only for being indigenous and poor) and Mexico (with respect to low education) (Tables A1, A3; A5 and A7)..

Regarding antenatal care, in all countries the odds of an appropriate number of controls were negatively associated with all the independent variables. However, low education appears to be the most important explanatory factor: OR ranging from 0.334 in Bolivia to 0.425 in Mexico. The model that considers interaction among variables showed no statistically significant relationships, but for the case where ethnicity and education were combined (Tables A2; A4; A6 and A8).

REFERENCES

Barber, S.L., 2007. Family planning advice and postpartum contraceptive use among low-income women in Mexico. In: *International Family Planning Perspectives*, 33 (1): 6-12.

Bodnar, Y., 1999. Comentarios a los documentos 22 y 23. In: CEPAL/ CELADE, *América Latina: aspectos conceptuales de los censos del 2000,* Santiago de Chile, CEPAL/CELADE, Serie Manuales 1:365-369.

Cospín, G. and Vernon, R., 1998. *Educación sobre salud reproductive en areas indígenas de Guatemala a través de maestros bilingües*. México, D.F., Population Council, Documento de Trabajo nº 2.

De Broe, S.; Hinde, A.; Matthews, Z. and Padmadas, S.S., 2005. Diversity in family planning use among ethnic groups in Guatemala. In. *Journal of Biosocial Sciences*, 37: 301-317.

Del Popolo, F. and Oyarce, A.M., 2005. América Latina, población indígena: perfil sociodemográfico en el marco de la Conferencia Internacional sobre la Población y el Desarrollo y de las metas del milenio. In: *Notas de Población*, 79: 13-52.

Del Popolo, F., Oyarce, A.M. and Ribotta, B., 2009. Indígenas urbanos en América Latina: algunos resultados censles y su relación con los Objetivos de Desarrollo del Milenio. In: *Notas de Población*, 86: 99-138.

Fernández Ham, P. 2003. Tendencias en la mortalidad y fecundidad indígenas. Comparación con la población nacional. In: González Montes, S (coord.), *Salud y derechos reproductivos en zonas indígenas de México. Memoria del seminario de investigación*. México, D. F., El Colegio de México, Documentos de Trabajo 13:17-18.

Freyermuth, G., 2003. Problemas teórico-metodológicos de la investigación sobre la mortalidad materna en los Altos de Chiapas. In. González Montes, S (coord.), *Salud y derechos reproductivos en zonas indígenas de México. Memoria del seminario de investigación*. México, D. F., El Colegio de México, Documentos de Trabajo 13: 9-11.

Glei, D.A.; Goldman, N. and Rodriguez, G., 2003. Utilization of care during pregnancy in rural Guatemala: does obstetrical need matter?. In: *Social Science and Medicine*, 57: 2447-2463.

Hurtado, E and Sáenz de Tejada, E. S, 2001. Relation between government health workers and tradicional midwives in Guatemala. In: Huber, B.R. and Sandstrom, A.R. (eds.), *Mesoamerican healers*. Austin, Texas, University of Texas Press.

Katzman, R.; Beccaria, L.; Filgueira, F; Golbert, L. and Kessler, G., 1999. *Vulnerabilidad, activos y exclusión social en Argentina y Uruguay*. Chile: Oficina Internacional del Trabajo, Fundación Ford, Equipo Técnico Multidisciplinario para Argentina, Brasil, Chile, Paraguay y Uruguay. Serie Exclusión Social Mercosur 107.

Lindstrom, D.P. and Muñoz-Franco, E., 2005. Migration and the diffusion of moderns contraceptive knowledge and use in rural Guatemala. In. *Studies in Family Planning*, 36 (4): 277-288.

Metz, B. , 2001. Politics, population and family planning in Guatemala: Ch'orti Maya experiences. In: *Human Organization* 60: 259–271.

Moser, C., 1997. *Household responses to poverty and vulnerability*. Washington, D.C.: Urban Management Programme, The World Bank.

Palomo Sánchez, N., 2003. La otra mitad de la salud. Muerte materna en zonas indígenas. In: Gómez, A (edit.), *Discriminación de género/raza/etnia. Mujeres negras e indígenas alzan su voz*, Santiago de Chile, Red de Salud de las Mujeres Latinoamericanas y del Caribe, Cuadernos Mujer Salud 8: 88-94.

Peralta Catalán, N. , 2003. Identificación de la población indígena en los censos nacionales. In: González Montes, S (coord.), *Salud y derechos reproductivos en zonas indígenas de México. Memoria del seminario de investigación*. México, D. F., El Colegio de México, Documentos de Trabajo 13: 22-24.

Peyser, A. and Chackiel, J., 1999. La identificación de poblaciones indígenas en los censos de América Latina. In: CEPAL/ CELADE, *América Latina: aspectos conceptuales de los censos del 2000,* Santiago de Chile, CEPAL/CELADE, Serie Manuales 1: 353-364.

Seiber, E. E. and Bertrand, J. T., 2002. Access as a factor in differential contraceptive use between Mayans and Ladinos in Guatemala. In: *Health Policy and Planning* 17, 167–177.

Sen, A., 1981. *Poverty and Famines: An Essay on Entitlement and Deprivation*. Oxford, UK: Clarendon Press.

Terborgh, A.; Rosen, J.; Santiso Gálvez, R.; Terceros, W.; Bertrand, J. and Bull S.E., 1996. La planificación familiar entre las poblaciones indígenas de América Latina. In: *Perspectivas Internacionales de Planificación Familiar*, número especial: 4- 11.

Ward, V.M.; Bertrand, J.T. and Puan, F., 1992. Barreras socioculturales que enfrenta la planificación familiar entre los mayas de Guatemala. In: *Perspectivas Internacionales de Planificación Familiar*, número especial: 19-25 and 41.

ANNEX

Table A1. Bolivia. Sexually initiated women, aged 15-49 years old. Odds ratios from logistic regression analysis of characteristics associated with modern contraceptive use

Characteristic	Odds ratio	
	Model 1	*Model 2*
Indigenous	0.477*	0.573 *
Rural	0.798*	0.880
Poorest household	0.735*	0.701 *
Low education	0.667*	0.760 *
Currently married	4.293*	4.263 *
Indigenous by rural		0.824**
Indigenous by poorest household		1.108
Indigenous by low education		0.764 *
Constant	0.293 *	0.273 *
n=13939		

Notes: *p<0.01 **p<0.05.
All characteristics were dichotomous variables.

Table A2. Bolivia. Women who gave birth during the five year period previous the survey, aged 15-49 years old. Odds ratios from logistic regression analysis of characteristics associated with adequate quantity of antenatal controls

Characteristics	Odds ratio	
	Model 1	*Model 2*
Indigenous	0.606*	0.716 *
Rural	0.774*	0.804**
Poorest household	0.538*	0.515 *
Low education	0.334*	0.384*
Indigenous by rural		0.939
Indigenous by poorest household		1.074
Indigenous by low education		0.786**
Constant	5.482*	5.024 *
n=7321		

Notes:*p<0.01 **p<0.05.
All characteristics were dichotomous variables.

Table A3. Guatemala. Sexually initiated women, aged 15-49 years old. Odds ratios from logistic regression analysis of characteristics associated with modern contraceptive use

Characteristics	Odds ratio	
	Model 1	*Model 2*
Indigenous	0.354*	0.373 *
Rural	0.622*	0.636 *
Poorest household	0.512*	0.430 *
Low education	0.672*	0.702 *
Currently married	3.707*	3.728 *
Indigenous by rural		0.912
Indigenous by poorest household		1.597**
Indigenous by low education		0.855
Constant	0.364*	0.360 *
n=7522		

Notes: *p<0.01 **p<0.05.
All characteristics were dichotomous variables.

Table A4. Guatemala. Women who gave birth during the five year period previous the survey, aged 15-49 years old. Odds ratios from logistic regression analysis of characteristics associated with adequate quantity of antenatal controls

Characteristics	Odds ratio	
	Model 1	*Model 2*
Indigenous	0.686 *	0.338 *
Rural	0.853**	0.804**
Poorest household	0.583 *	0.630 *
Low education	0.412 *	0.326 *
Indigenous by rural		1.157
Indigenous by poorest household		0.866
Indigenous by low education		2.111 *
Constant	7.306*	8.881 *
n=5073		

Notes:*p<0.01 **p<0.05.
All characteristics were dichotomous variables.

Table A5. Mexico. Sexually initiated women, aged 15-49 years old. Odds ratios from logistic regression analysis of characteristics associated with modern contraceptive use

Characteristics	Odds ratio	
	Model 1	*Model 2*
Indigenous	0.633 *	0.684 *
Rural	0.690 *	0.685 *
Poorest household	0.908**	0.886**
Low education	0.823 *	0.860 *
Currently married	3.409 *	3.407 *
Indigenous by rural		1.025
Indigenous by poorest household		1.115
Indigenous by low education		0.755**
Constant	0.593 *	0.590 *
n=14529		

Notes: *p<0.01 **p<0.05
All characteristics were dichotomous variables.

Table A6. Mexico. Women who gave birth during the five year period previous the survey, aged 15-49 years old. Odds ratios from logistic regression analysis of characteristics associated with adequate quantity of antenatal controls

Characteristics	Odds ratio	
	Model 1	*Model 2*
Indigenous	0.627 *	0.420 *
Rural	0.722 *	0.695 *
Poorest household	0.804 *	0.739 *
Low education	0.425 *	0.413 *
Indigenous by rural		1.288
Indigenous by poorest household		1.362
Indigenous by low education		1.205
Constant	8.405 *	8.757*
n=6734		

Notes: *p<0.01 **p<0.05
All characteristics were dichotomous variables.

Table A7. Peru. Sexually initiated women, aged 15-49 years old. Odds ratios from logistic regression analysis of characteristics associated with modern contraceptive use

Characteristics	Odds ratio	
	Model 1	*Model 2*
Indigenous	0.503 *	0.401**
Rural	0.636 *	0.623 *
Poorest household [a]	0.902	0.935
Low education	0.712 *	0.693 *
Currently married	4.656 *	4.670 *
Indigenous by rural		1.442
Indigenous by poorest household [a]		0.739
Indigenous by low education		1.223
Constant	0.281 *	0.281 *
n=4844		

Notes: [a] Proxy variable for poverty used "Earth as main floor material".
*p<0.01 **p<0.05
All characteristics were dichotomous variables.

Table A8. Peru. Women who gave birth during the five year period previous the survey, aged 15-49 years old. Odds ratios from logistic regression analysis of characteristics associated with adequate quantity of antenatal controls

Characteristics	Odds ratio	
	Model 1	*Model 2*
Indigenous	1.499 *	0.176 *
Rural	0.461 *	0.484 *
Poorest household [a]	0.872	0.752
Low education	0.423 *	0.346 *
Indigenous by rural		3.012
Indigenous by poorest household [a]		2.137**
Indigenous by low education		2.213**
Constant	11.885 *	13.433 *
n=2053		

Notes: [a] Proxy variable for poverty used "Earth as main floor material".
*p<0.01 **p<0.05
All characteristics were dichotomous variables.