

Estimating the incidence of abortion in Burkina Faso

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Context and objectives of the study

Information on the incidence of abortion is vital to determining the scope of the problem of unintended pregnancy and unmet need for effective contraception. Where abortions are unsafe, information on abortion-related morbidity is additionally important as a tool to raise awareness of the problem; compel policymakers and program planners to action; and monitor progress in improving women's reproductive health.

Yet, measuring the incidence of induced abortion is difficult, particularly where abortion laws are highly restrictive. In these settings, procedures are not recorded in official health records and official statistics on abortion incidence do not exist. Several methods have been employed to date to estimate the frequency of induced abortions in such environments. These include surveys asking women about their experiences of abortion, by either questioning them directly, using self-completed questionnaires or employing other methods to ensure the respondent's confidentiality. Evidence suggests that all these methods are prone to underreporting by women, despite best efforts to encourage full reporting.¹

Abortion is highly legally restricted in Burkina Faso and legal exceptions exist only for incest, rape, fetal defect or when the woman's life is endangered. Given the difficulty of documenting abortion in settings where it is illegal, we undertook research using two existing methodologies to provide robust and comprehensive information on abortion incidence, abortion-related morbidity, conditions under which the procedure is performed, as well as differences in these factors according to key characteristics of women including their age, poverty status and region of residence.

The first of these approaches has been referred to as the Anonymous Third Party Reporting (ATPR) method; it entails conducting a survey of women and asking respondents to report instances of abortion that they have heard of within their social networks.² A 2001 study in Ouagadougou, the capital city of Burkina Faso, found that the rate of abortion was high, that 60% had adverse health consequences, and 14% were treated in hospitals.³

The second approach is the Health Facilities Complications Method (HFCM).⁴ This method entails gathering statistics on the number of women hospitalized for abortion-related complications from all relevant facilities in the country, and surveying health professionals to obtain estimates of the complication rate of the abortion in the country and the proportion of women who seek treatment at a hospital when faced with abortion complications. Findings from studies employing this approach in several developing countries have been published elsewhere.⁵

We present here the research methodology and findings based on the first of these methods the ATPR method. Subsequent research will include analysis of findings from the HFCM and a comparison of the results from the two approaches.

Methods and Results

1. Quality of sampling

The first step of the analysis is to ensure the quality of the data collected from a representative sample of women in reproductive age, by comparing the respondents' socio-demographic characteristics to other data. We compared the sample of our national survey conducted in 2009 to the latest Burkina DHS, which goes back to 2003.

Table 1

	2003 DHS	2006 census	2009 abortion survey
Region			
Boucle du Mouhoun	7,3	10,3	10.0
Cascades	3,3	3,8	7.3
Centre	13,3	12,3	10.2
Centre Est	8,4	8,1	6.9
Centre Nord	8,4	8,6	6.7
Centre Ouest	7,3	8,5	6.8
Centre Sud	5,9	4,6	7.3
Est	7,3	8,6	5.1
Hauts Bassins	12,9	10,5	10.2
Nord	9,4	8,5	8.0
Plateau Central	5	5,0	8.0
Sahel	6,8	6,9	6.4
Sud Ouest	4,8	4,4	7.1
Urban / rural			
Ouagadougou	11,4	10,5	8.9
Other cities	10,3	12,2	9.6
All urban	21,6	22,7	18.5
Rural	78,4	77,3	81.5
Age			
15-19	22,3	22,8	17.1
20-24	18,2	20,4	19.4
25-29	16,6	16,8	18.2
30-34	12,7	13,4	15.7
35-39	12,2	10,6	12.7
40-44	9,6	9,0	9.8
45-49	8,4	7,0	7.0
Education			
None	71,7	80,8	62.3
Primary	19,6	9,1	28.3
Secondary or more	8,7	10,2	9.5
Marital status			
Single	18,7	21,6	12.5
Married	68,6	73,7	72.3
Cohabiting	8,8	0,4	12.3
Divorced/ widowed	3,9	4,3	2.9
TOTAL			4205
Note: The sample of respondents to the 2009 survey is weighted to take into account a two-stage clustering procedure. This is true throughout the rest of the present analysis.			

As we can see in Table 1, the distribution by age and marital status of our sample of respondents is comparable to the results of the 2003 DHS, as is the distribution of women living in rural and in urban areas. Several differences should be underlined, however: the 2009 survey has more women with a primary school education level and fewer women with no education at all; also fewer women interviewed in 2009 live in Ouagadougou, and more in other urban centers compared to the 2003 sample. Finally, fewer women live in the region Hauts Bassins, and more live in the regions Sud Ouest, Plateau Central, Cascades and Boucle du Mouhoun compared to 2003. Do these differences reflect real trends in educational attainment and migratory flows?

The differences observed in the proportions according to education level show a real trend that can be explained, despite some variations in the definition. The primary level in 2003 and 2009 takes into account the first 6 years of basic education and literacy, however for 2006 the latter element is not included. This explains the differences between the 2006 data and the others. In terms of progress, education policies, increasing access to schools, especially for girls, and literacy campaigns have contributed to an increase in the population's level of education.

The differences that exist between urban and rural areas result from sampling, which is based on the area of enumeration (ZD) and the household, in terms of population. The composition of households is different depending on urban or rural location. The household size would justify these differences due to sampling particularly for Ouagadougou.

For marital status, the differences are not significant. The differences observed in 2006 result mainly from considering living together as unmarried.

By asking our 4205 respondents to list all women (aged 15 to 49) who confided in them during the preceding year, we obtained a second sample: the sample of women of reproductive age who confide to the respondents. Our respondents declared being the confidant of 7895 women of reproductive age in the year preceding the survey; on average, each respondent is therefore the confidant of 1.9 women. How does this second sample compare to the first one? We know the place of residence, age, and level of education at the time of the survey for each woman who confides in a respondent, so that we can compare the two samples along these characteristics.

We first noticed that the number of women confiding in the respondents varied greatly by region: the greatest difference is between the region Nord, where respondents are the confidants of 3.25 women on average, and the region Centre Sud where respondents are the confidants of 0.66 women on average (Table 2). When reporting these numbers on a map, we see that the entire southern part of Burkina is characterized by fewer relations of confidence among women, as opposed to the Northern part of the country (Map 1). Since this divide corresponds grossly to an ethnic divide (between the Mossé and similar groups in the North and the Bobo and similar groups in the South), we concluded that the differences observed in the frequency of confidence between women have some cultural underpinning. This phenomenon implies that the northern regions of the country are overrepresented in our second sample (the sample of women who confide); we thus computed a set of weights correcting for the frequency of confidence relations by region, so that the second sample (women confiding to the respondents), after application of these weights, is distributed across regions exactly like the first sample (respondents).

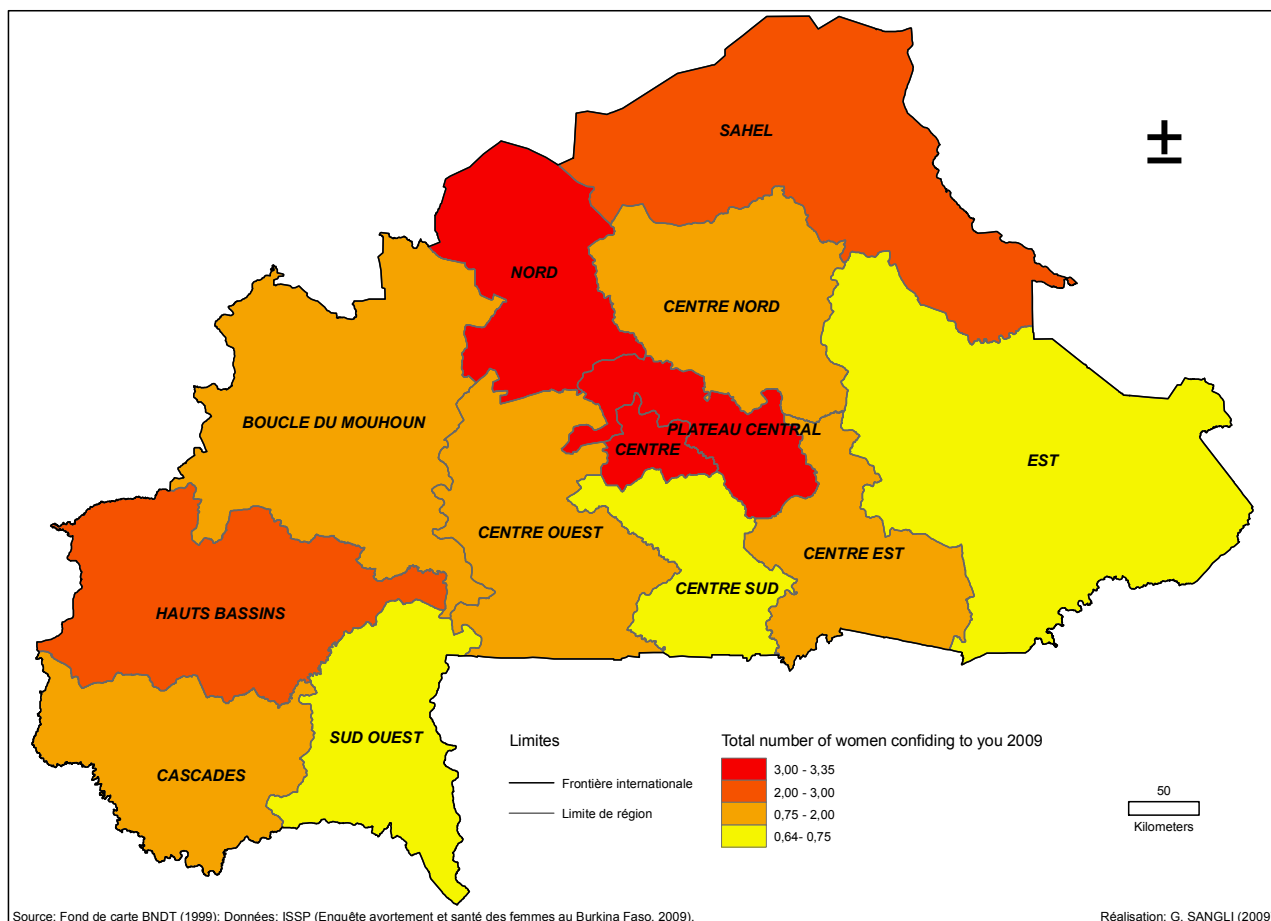
Table 2

Total number of women confiding to you

Region	Mean
BOUCLE DU MOUHOUN	1.83
CASCADES	0.96
CENTRE	3.15
CENTRE EST	1.90
CENTRE NORD	1.13
CENTRE OUEST	0.99
CENTRE SUD	0.67
EST	0.74
HAUTS BASSINS	2.24
NORD	3.36
PLATEAU CENTRAL	3.39
SAHEL	2.16
SUD OUEST	0.71
Average	1.88

Note: the sample of respondents is weighted to correct for the sampling procedure. A number of census tracks were first drawn randomly, and then a number of households within these census tracks were selected randomly; all women in reproductive age were interviewed in the selected household. The sample was additionally drawn so that the sample in each of the 13 regions is representative, as well as the urban and the rural samples.

Map 1 : Total number of women confiding to you



It is well known that individuals tend to choose their peers as confidants, because the reciprocity of situations allows for the reciprocity of confidence, which is an important factor ensuring that the person you confide in keeps your secrets (Victor 1981). We thus expect the second sample (women confiding to the respondents) to have, generally speaking, the same socio-demographics characteristics as the first sample (respondents). However, another phenomenon is likely to be at play: women with more resources are more likely to confide to others, since different forms of resources usually go hand in hand, and communication within networks is one resource which more resourceful women are more likely to tap into. Since women with greater capitals usually confide to women of their own class, we thus expect respondents with more resources to be the confidant of more women (data not shown), and women who confide to the respondents to have more resources than the general population. Our data shows exactly these patterns (Table 3): the distribution of age, educational level and place of residence (urban/ rural) is generally speaking similar when comparing the sample of respondents and the sample of women who confide in them, although women who confide have a somewhat higher level of education and are somewhat more likely to live in an urban center. The latter differences seem however too small to warrant the introduction of additional weights by level of education or urbanity, weights which would be applied to the second sample (women who confide), in order to render it more representative of the general population of women of reproductive age living in Burkina Faso. We deemed the sample of women who confide representative of the general population after having only corrected for its regional distribution.

Table 3

	Respondents	Women who confide to the respondents
Urban / rural		
Ouagadougou	8.9	9.4
Other urban centers	9.6	13.6
All urban	18.5	23.0
Rural	81.5	77.1
Age		
15-19	17.1	16.7
20-24	19.4	20.8
25-29	18.2	19.8
30-34	15.7	17.0
35-39	12.7	10.9
40-44	9.8	9.2
45-49	7.0	5.6
Mean Age	29.04	28.31
Education		
None	78.2	75.1
Primary	12.4	12.2
Secondary	8.6	11.2
Tertiary	0.9	1.2
N	4805	7895
Note: sample of women who confide is weighted to correct for regional differences in the number of women who confide per respondent (additionally to the weights applied to the sample of respondents, also applied to the women who confide).		

2. The incidence of abortion among women who confide to the respondents

We asked, for each woman reported as confiding to the respondents, whether she had an abortion, and this for each of the five years preceding the survey, that is for 2008, 2007, 2006, 2005 and 2004. We also asked when the relationship of confidence started, and where the women confiding was residing for each of the 5 years preceding the survey. We eliminated from our calculations all confiding women who were not in the proper age range (15 to 49) in a one of the five years preceding the survey, all those who were not yet confiding to the respondent in one of these years, and all those who were residing outside of Burkina Faso at the time. Having done so, we obtained the following number of “women-confiding-years”, per year and per place of residence (urban / rural) (Table 4).

Table 4

	2004	2005	2006	2007	2008	
Urban	797	882	1038	1235	1436	5388
Rural	3632	3869	4448	5150	5583	22682
DNK (Burkina)	1	1	1	3	3	9
TOTAL women confiding years	4430	4752	5487	6388	7022	28079

We then counted the number of abortions which occurred during these years. Respondents could answer “no” or “do not know” to the question “did your relation x have an abortion in year z?” or could answer “yes”, and then give the number of abortions which occurred that year (usually 1, but 2 abortions were recorded in two cases for a single year by the same woman). For each reported abortion, additional questions made sure the respondent did not mean a spontaneous abortion, or did not talk about an abortion attempts which did not succeed. We obtained the following responses to this set of questions (eliminating all abortions which were spontaneous or attempts).

Table 5

	2004	2005	2006	2007	2008	
No	4406	4843	5658	6618	7354	28879
Yes: 1	20	25	60	107	125	337
Yes: 2	0	1	0	1	0	2
Total Abortions	20	27	60	109	125	341
Do Not Know	49 1.09%	53 1.08%	50 0.87%	60 0.88%	50 0.66%	262 0.89%
Confiding Women-Years	4475	4922	5768	6786	7529	29480

Altogether, we collected data on 317 (unweighted) abortions; this number amounts to 341 abortions once weights have been applied (note that due to rounding, the weighted abortion total varies from 341 to 361 in the displayed tables). Note that all the women confiding years where respondents did not know whether their relation had an abortion or not (262 years) were taken out of the rest of the analysis; by doing so, we assumed that women experienced the same abortion rates during these years than during years for which respondents were certain they had an abortion or not.

Table 6

	2004	2005	2006	2007	2008	Total
Urban	6	6	24	31	48	115
Rural	15	21	35	77	78	226
DNK	0	0	1	0	0	1
Total abortions (weighted)	21	27	60	108	126	342

Dividing the numbers in table 6 by the numbers in Table 4 to which were subtracted the confiding women years for which the respondents did not know whether the relation had an abortion or not, we obtained the following set of abortion rates.

Table 7

	2004	2005	2006	2007	2008	
Urban	0.007528	0.006803	0.023121	0.025101	0.033426	0.021344
Rural	0.00413	0.005428	0.007869	0.014951	0.013971	0.009964
DNK	0	0	1	0	0	0.111111
	0.00474	0.005682	0.010935	0.016907	0.017944	0.01218

As we can see, the nationwide abortion rate is 17.9 abortions per 1000 women aged 15 to 49 in 2008, and this number amounts to 16.9 in 2007, and drops to 10.9 in 2006. The abortion rate decreases even more in years further back: 5.7 in 2005 and 4.7 in 2004. Since abortions rates, like other demographic indicators change only slowly, such a trend is highly unlikely, and is in all probability due to recall bias for the years more removed from the survey. The data displayed in Table 5 do not show major differences when it comes to the numbers of years for which respondents declare not knowing whether their relation had an abortion or not. In the absence of any indication on when recall bias may be kicking in, we propose to keep only the two years preceding the survey to estimate the national abortion rate in Burkina Faso. All the rest of the analysis will be performed by combining the 2007 and 2008 data. In these two years, we collected data on 234 abortions after applying the weights (note that due to rounding, the weighted abortion total varies from 234 to 241 in the displayed tables).

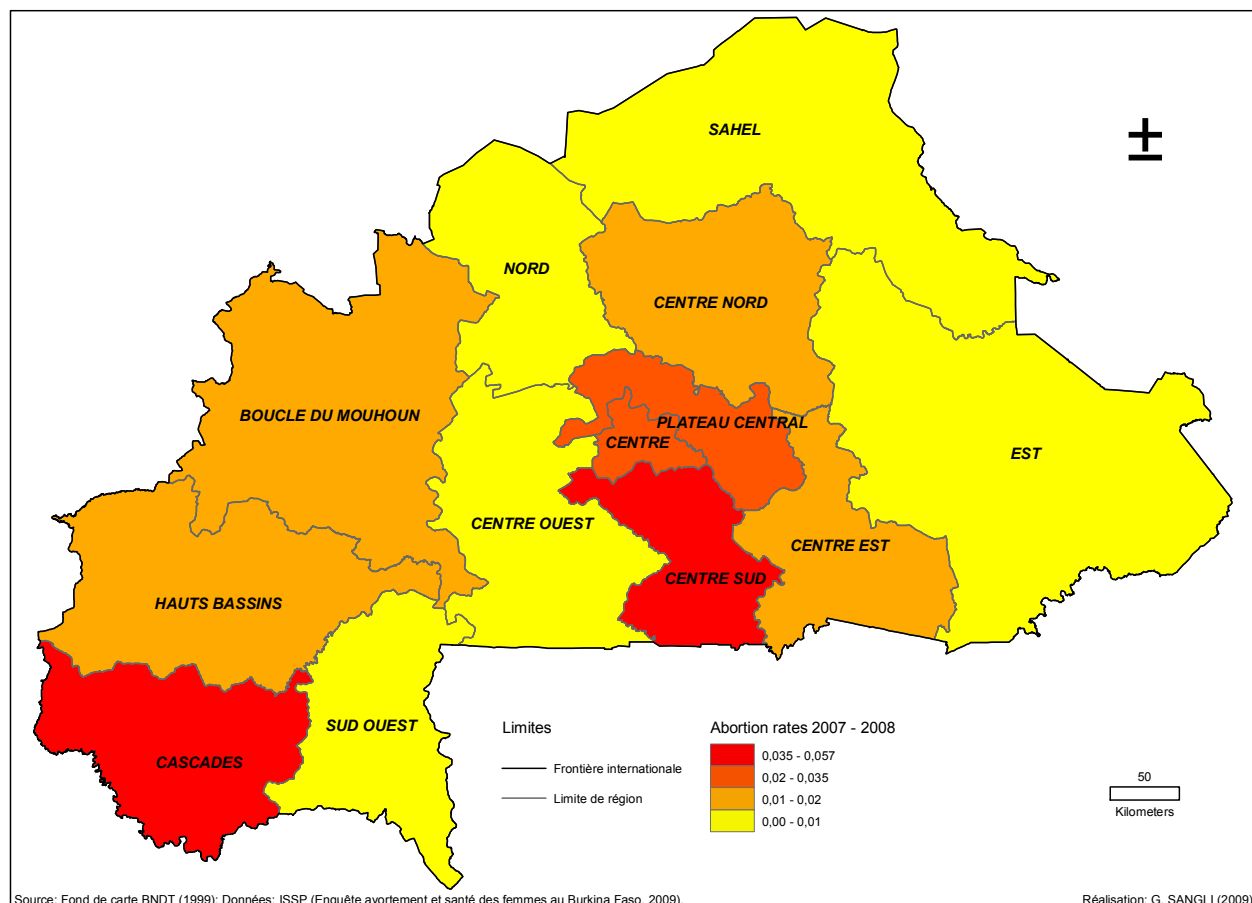
As we can see in Table 8, the abortion rate is highest at the beginning of the reproductive life cycle (15 to 24 years), drops in the middle reproductive ages (25 to 34), and decreases even further in the late reproductive years (35 to 49). As expected, the abortion rate is higher in urban areas; in fact, it is about double what is found in rural areas. However, the region corresponding grossly to Ouagadougou, the capital (Centre), does not have the highest abortion rate in the country. There are markedly higher rates in the South and South West region of Burkina Faso (including the second largest city of Burkina Faso, Bobo Dioulasso) (Map 2). The ethnic groups dominant in these areas are indeed characterized by more liberal attitudes and practices of premarital sex by women compared to the rest of the country (reference).

Table 8

Age	2007	2008	Total
15 - 19	0.019061	0.029842	0.024858
20 - 24	0.025401	0.02439	0.024872
25 - 29	0.010271	0.009485	0.009863
30 - 34	0.015513	0.016484	0.016018
35 - 39	0.01264	0.002681	0.007545
40 - 44	0.004706	0.006757	0.005754
45 - 49	0.057471	0	0.026455
Residence: urban / rural			
Urban - Ouaga	0.022945	0.028571	0.026019
Other urban centers	0.028129	0.038462	0.033619
All urban	0.025101	0.033426	0.029577
Rural	0.014951	0.013971	0.014441
Residence: Region			
Boucle du Mouhoun	0.016393	0.01043	0.013213
Cascades	0.035714	0.04277	0.039404
Centre	0.022887	0.028024	0.025682
Centre Est	0.012987	0.009709	0.011259
Centre Nord	0.013761	0.010823	0.012249
Centre Ouest	0	0	0
Centre Sud	0.055449	0.058722	0.057169
Est	0.006079	0	0.002865
Hauts Bassins	0.006192	0.020029	0.013383
Nord	0.010909	0.008711	0.009786
Plateau Central	0.021654	0.02011	0.020853

Sahel	0.009592	0.006803	0.008159
Sud Ouest	0.006977	0.01046	0.008811
Total	0.017336	0.01845	0.01792

Map 2 : Total number of women confiding to you



Finally, our data indicate that about half of the reported abortions (in 2007 and 2008) were followed by health complications, and out of these, about half required treatment in a health centre, so that altogether, about one quarter of all abortions necessitate post-abortion care in a health facility.

Table 9

Complications	
Yes	45.9%
No	52.4%
DNK	1.6%
N	246
Treatment in health facility	
Yes	23.3%
No	73.5%
DNK	3.2%
N	249

3. Tracking possible biases inherent to the estimation method (internal validity checks)

The method used to estimate the abortion rate could be flawed by several biases. A first problem may be that women who have larger networks of close relations, that is, confide in more people, may be more successful in accessing abortion services, since women use their network of close relation in Burkina Faso to locate a clandestine abortionist. If this was true, our method would overestimate the abortion rate, since the sample of confiding women necessarily over-represents women who confide in more female relations. We asked for each woman confiding to the respondent whether the respondent knew if she was confiding to her alone, or to 2 or 3 women altogether, or to more than three women. As we can see (Table 9), quite a few respondents did not know whether their relation confided to other women. However, the responses we do have do not suggest that women who confide to more people are more likely to have an abortion: women reported as having only one confidant have altogether an abortion rate of 19 per 1000 per year, women reporting two or three confidants have an abortion rate of 14 per 1000 per year, and women having more confidants have an abortion rate of 22 per 1000 per year.

Table 9

Number of confidants of women confiding to the respondents				Total women confiding to the respondents	
	2007	2008			
One confidant	0.023041	0.015815	0.019285	1871	23.7%
2-3 confidants	0.011745	0.017002	0.014481	717	9.1%
More than 3 confidants	0.014235	0.028754	0.021886	359	4.5%
DKN	0.016254	0.018293	0.017325	4948	62.7%
Total	0.017357	0.01806	0.017725	7895	100%

Another possible bias inherent to the method is that women may be more likely to talk to their close relations about their abortion when they experience health complications and when they need to attend a health facility, because they may need help in seeking care. If this were true, the estimation method would overestimate the proportion of abortion seekers experiencing health complications after the abortion, and the proportion of abortion seekers getting post abortion care in a health facility. For each recorded abortion, we asked the respondent whether she knew how many other confidants were aware of it. We thought that this information would help us check whether the characteristics of the abortion vary according to the number of confidants sharing the secret. Unfortunately, an error in filters was introduced in the questionnaire, and only women experiencing complications and seeking care in a health facility were asked this question, so that we are ultimately unable to perform this internal check. Qualitative data indicate however that women experiencing complications and seeking post abortion care often obtain help by mentioning some other ailment than abortion.

Another possible bias of the method could be that women report differently on the abortions of their friends according to their opinion on abortion, that is, that women who have conservative views towards abortion underreport the abortion of their relations. Our assumption is that this is not the case (as opposed to what happens when women are asked about their own abortions), and that is why we ask respondents to tell us about the abortions of their friends. We asked questions on the respondents' attitudes towards the abortion (at the end of the survey), so that we can compute the abortion rate of women who confide in the

respondents with different opinions towards abortions¹. We see (Table 10) that abortion rates are higher among women confiding to respondents with more liberal abortion attitudes. Before concluding on the existence of a bias linked to the respondent's attitudes towards abortion, we will have to perform a multivariate analysis to control for the respondents' characteristics, since abortion attitudes vary by age, place of residence and level of education, as do abortion rates.

Table 10

	2007	2008	Total
Conservative	0.010879	0.011656	0.011288
Moderate	0.022837	0.01916	0.020921
Liberal	0.030418	0.052448	0.041894
	0.017126	0.017844	0.017502

4. Comparison with the estimates of an early survey using the same method in Ouagadougou

We applied this estimation method for the first time in the city of Ouagadougou in 2001. How do the present results (looking only at the results for the region "Plateau central", which corresponds closely to the limits of the city of Ouagadougou) compare to the results of the previous survey?

In the earlier survey, we had found an abortion rate of 41 per 1000 for the years 1997-2001, as opposed to a rate of 26 in 2007-2008 (Centre). Did the abortion rate really decrease by half over the period? This interpretation seems unlikely, since contraceptive prevalence has not registered great progress over the same period in the city, at least for the period up to the 2003 DHS (give contraceptive prevalence, Ouagadougou, two last DHS). What seems to be at stake, rather, is a mistake in the first (ever) application of the ATPR method, which we had underlined at the time: our network generator question included the word "abortion". In other words, we asked about relations who had shared secrets with them over the past year, such as abortions. As feared at the time, this specification has apparently focused respondents on those of their friends who had had an abortion recently, leading to an overestimation of the abortion rate in the first survey. A number which is significant in this regard is that the Ouagalese respondents of the 2001 survey declared being the confidant of only one woman on average, as opposed to the Centre respondents in 2009 which reported being the confidant of about 3 women on average.

If the abortion rate seems to have been an overestimate in the first application of the ATPR (because of a mistake in generating the denominator of the abortion rate), the information collected about the abortions themselves seem close in the two surveys (which would tend to indicate that the estimation of the numerator may have been correct in the first application of the ATPR). We found in 2009, like in 2001, a sharply decreasing abortion rate by age. In 2001, respondents declared that their relations had encountered some health problems in 60% of the reported abortion, and that 47% sought post abortion care. In the 2009 survey, we find a complication rate of 39% and a rate of post abortion care of 31 % for the Centre region².

¹ This classification was based on their responses to a series of four questions, regarding under which conditions (if any) the respondent deemed an abortion to be acceptable: 1) when the couple wants to limit the number of children. 2) when the couple wants to space their births. 3) when the pregnancy is affecting the health of the woman. 4) when the pregnancy is endangering the woman's life.

² One intriguing point is that when multiplying the entire population of women in reproductive years living in Ouagadougou in 2001 by the hospitalization rate, we found a number which was close the number of hospital admissions for post abortion care which we had recorded independently in the city's health centers. However,

Further research

We will compare these results to those yielded by the method developed by the Guttmacher. In the latter method, the number of annual post abortion care cases is estimated from a health facility survey, which is then multiplied by a “multiplier” estimated from a survey of health professionals, which were asked to estimate the ratio of abortion to post abortion care cases. More specifically, we will compare:

- 1) the annual national number of post abortion care cases estimated by the health facilities complications method, and the annual national number of post abortion care cases estimated using the ATPR method. For the last number, we multiplied the number of women aged 15-49 in Burkina Faso in 2008 (3 440 256), by our national abortion rate (18.2 per 1000 see Table 8) to obtain an annual number of abortions (62 613); we then multiply this last number by the post abortion care ratio (23.3%, see Table 9), and obtain an annual national estimate of post abortion care cases amounting to 14 589.
- 2) The multiplier yielded by the health facilities complications method and the multiplier yielded by the ATPR method. For the last number, we use the inverse of 23.3%, which is 4.3. In other words, according to ATPR estimates, the annual number of post abortion care cases recorded nationally in 2008 in Burkina Faso has to be multiplied by 4.3 to obtain the total number of abortion in that country that year.

Once we have the estimates of the health facilities complications method, we will decide (based on the strength of internal validity checks and possible biases in the results of each method) to keep one of the two annual number of post abortion care cases, and one of the multipliers. For example, we could decide to keep the HFCM estimates for the annual number of national abortion care cases, and the ATPR estimate for the multiplier. The respective weaknesses of each method will be taken into account when making that decision. We will then be able to provide final estimations for the induced abortion rate in Burkina Faso in 2008 and its health consequence for women.

¹ Rossier, C. Estimating induced abortion rates: A review. *Studies in Family Planning*, 34(2), (2003). 87–102.

² Rossier SFP

³ Rossier C, Guiella G, Ouédraogob A, Thiéba B. Estimating clandestine abortion with the confidants method—results from Ouagadougou, Burkina Faso *Social Science & Medicine* 62 (2006) 254–266.

⁴ Singh (best reference to be determined).

⁵ Reference include:

Singh S. and Wulf D. Estimated levels of abortion in six Latin American countries *International Family Planning Perspectives* 20(1): 4-13, 1994.

that number of hospital admission for post abortion care was obtained using the WHO protocol, by adding all three categories “certainly induced”, “probably induced” and “possibly induced”. The last category (the most numerous) must have contained in fact lots of spontaneous abortions. We had underlined at the time the difficulty of testing an uncertain estimate against another uncertain estimate

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