Trends and barriers of use of long acting reversible contraception in France:

Results from a population based survey

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Introduction

Research in Family planning relayed in Family planning policies in several countries have emphasized the need to promote the use of long acting reversible contraception (LARC) methods, including copper intra uterine devices (copper-IUDs) levonorgestrel releasing intra uterine devices (IUS) and hormonal implants, as the most cost/effective strategy to reduce unintended pregnancies (Blumenthal *et al.*, 2011, Mavranezouli *et al*., 2008 ; ACOG, 2009). Because they do not require daily adherence, these methods are shown to be substantially more effective than user-dependent hormonal methods that suffer higher typical use failure rates (Moreau *et al.*, 2007; Kost *et al.*, 2008): a recent study based on a large prospective cohort of women in the US, reported 4.55 pregnancies per 100 participant-years among user-dependent hormonal users as compared to 0.27 pregnancies per 100 participant-years among LARC users (Winner *et al.*, 2012). Results from the French National Abortion Patient Study, a national representative survey of 11,400 women undergoing an abortion in France in 2007, also show that 61.5% of pregnancies leading to abortions were due to user-dependent method failures (33.5% related to barrier and natural methods use, 25% to pill use, 3% other hormonal user-dependent methods), while less than 2% occurred to women using LARC (Moreau *et al.*, 2010). LARC methods are also less likely to be discontinued. Based on a national cohort of women of reproductive age in France, 11% of IUD users were found to have discontinued their method for method related reasons within the first year of use as compared to 22% of pill users and x% of condom users (Moreau *et al.*,

2009).

Despite these advantages, LARC methods remain largely under-utilized in France among young women have the highest rates of abortion (Vilain, 2010). While the IUD has been the second most popular method among all women in France since the 1980s (Leridon *et al.*, 2002); it's use has remained virtually null among women less than 30 years, reflecting the reticence of the medical profession to insert IUDs among young or nulliparous women as well as misconceptions of young women themselves (Speidel *et al.*, 2008). To take on this issue, the French national health agency published revised clinical guidelines on contraception in 2004, recommending intra uterine devices as a cost effective method for women of all ages, regardless of their parity (ANAES, 2004). At the same time, the introduction of new long acting hormonal options in the form of the IUS in 1995, followed by the contraceptive implant in 2001, has offered women new alternatives to the oral contraceptive pill, by far the most popular method among young women in France (Bajos et al., 2003), thereby increasing the chances of improving LARC uptake.

This study aims to describe the trends in use of LARC methods over the last decade and investigate the determinants and barriers of use of these methods among young women less than 30 years old in France.

Data and methods

Study population

In this study, we use data from 3 population based surveys carried out in France over the last decade: the 2000 and 2005 waves of the National Health Barometer Survey, and the FECOND study, the most recent sexual and reproductive health survey conducted in 2010-2011.

The two waves of the Health Barometer survey share the same study design, following a two stage random probability sampling method (Guilbert *et al.*, 2001). An initial sample of households was drawn from the telephone directory, from which one eligible respondent per household was selected at random to participate. The present analysis includes 1862 women aged 15–29 years interviewed in 2000 and 2993 interviewed in 2005. The FECOND study followed the same methodology, with the exception that in addition to the selection of individuals using a landline phone, the sample also

included a subsample of cell phone only users to represent the growing population of individuals in France who do not own a landline (14% of the 15 to 49 age group in 2009). A total of 1964 women ages 15 to 29 years were included in the FECOND study.

For the purpose of this analysis, we only included women who were in need of contraception, that is, women at potential risk of becoming pregnant unintentionally. Women were not considered as being at risk in the following situations: 1) pregnant or trying to conceive 2) sterile or partner sterile 3) had just given birth or were breastfeeding 4) had no heterosexual interactions in the last 12 months. We also excluded women who did not report on their use of contraception (n=20 in 2000, n=45 in 2005 and n=5 in 2010). Our final study population comprised 1204 women in 2000, 1921 women in 2005 and 1274 women in 2010.

In all 3 surveys, data were collected via anonymous telephone interviews, after giving oral consent.

All studies received approval from the relevant French government oversight agency (CNIL, the Commission Nationale de l'Informatique et des Libertés).

Socio-demographic and Reproductive characteristics

In all 3 surveys, women reported on their age, parity, partnership status, school attainment and employment status. Other common health indicators included smoking status and obesity. We were also able to reconstruct a measure of prior abortion history, based on a single question in both Health Barometer surveys, and based on the description of all pregnancy outcomes in the FECOND study.

More detailed information on women's reproductive histories (past unintended pregnancies) and current or future pregnancy intentions were collected in the FECOND study. In 2010, women were also asked about their healthcare coverage and reproductive service use patterns over the last 12 months (type of family planning provider).

Contraceptive behaviours

In all 3 studies, women described their current use of contraception and their reasons for non-use. More precisely, women were asked if they were currently using anything to avoid becoming pregnant including natural and/or barrier methods and if so, what specific methods they were using. If women

reported more than one method, a hierarchical algorithm retained the most effective method reported at the time of the survey.

Further details about women's current contraceptive behaviours were collected in the FECOND study, including the type of IUD used (copper *versus* hormonal releasing devices), method satisfaction and duration of use. Women were also asked about their lifetime contraceptive experiences, allowing for an estimation of lifetime use of LARC methods. Finally, attitudes towards IUDs were briefly explored. Half of the women (n=550) were randomly selected to respond to questions related to their attitudes towards IUDs, including if IUDs were indicated for nulliparous women, if they were comfortable to use and if they could cause fertility problems.

Statistics

First, we used univariate statistics to describe demographic, social and reproductive characteristics of women as well as their use of contraception by year of survey. We explored changes in LARC use from survey year to survey year and over the 3 time points using logistic regression models and tested for interactions, by women's age, socio-economic status and reproductive history.

We then turned to the most recent survey carried out in 2010-2011 and used descriptive statistics as well as multivariate logistic regression models to explore the determinants and barriers to the use of LARC methods (overall and by specific methods), according to women's socio-demographic characteristics, reproductive histories, pregnancy intentions, and their type of healthcare service use and coverage. We also described their attitudes towards the IUD.

All analyses were weighted to account for the complex survey designs of each study. In each study woman were assigned a sampling weight, inversely proportional to the probability of being selected in the sample. A further adjustment was applied to reflect the characteristics of women in the general population based on census data.

Results

The characteristics of young women by year of survey are presented in Table 1. The mean age of participants was 23.1 years [22.8-23.1]. Four in ten young women were cohabiting with their partner with no difference across survey, while the proportion of women who had a child decreased from

25.7% in 2000 to 20% in 2010 (p=0.005). Women in 2000 were less likely to be students, while the proportion of women with a higher education diploma was greatest in the 2005 sample. Results also indicate a decline in the proportion of smokers (p=0.001) while the proportion of obese women increased over time (p<0.001). Nine percent of women reported having had a prior abortion, with no difference across the 3 surveys.

Trends in LARC use from 2000 to 2010

Three quarters of respondents (75.1%) relied on user-dependent hormonal contraception, while 13.3% were using natural or other barrier methods, including the condom. Trends in contraceptive use over time, suggest a decline in hormonal dependent methods and an uptake of local or natural methods in the last 5 years. In any given year, only a minority of women in need of contraception were using LARC methods (5.4%), with no significant difference by year of survey (p=0.11). After controlling for sociodemographic and reproductive characteristics however, the increase in LARC use became significant (p=0.001), although the change was only statistically significant between 2005 and 2010 (OR=1.8 [1.2-2.6]). We found no differences in these trends across women's age, socio-demographic and reproductive characteristics (Table 2). The overall uptake in LARC use was solely explained by the introduction of the contraceptive implant in 2001, with 1% of implant users in 2005 and 2.6% in 2010 (p=0.001). In the same time, the proportion of IUD users gradually declined from 4.6% in 2000 to 3.9% in 2010, although the reduction is not significant (p=0.66).

Determinants and Barriers to LARC use in 2010

A more in depth analysis of lifetime use of LARC and factors associated with current use of LARC methods was performed among women who were interviewed in 2010 (Table 3). Results indicate that 11.4% of women at potential risk of an unintended pregnancy at the time of the survey had ever used a LARC method, with 5.4% who had ever used an implant and 6.6% who had ever used an IUD. At the time of the survey, 6.6% of women in need of contraception reported using LARC methods: 2.6% of women were using the implant, 1.5% had a copper IUD and 2.3% were using the IUS. Excluding the 259 women who were planning to become pregnant in the next 2 years, the proportion of LARC users remained virtually unchanged (7.0%).

Overall use of LARC varied substantially by women's age and reproductive histories (Table 3). The odds of using LARC were more than 4 times higher in women in their twenties as compared to teenagers. The increase was even greater in parous women. Prior experience of an unintended pregnancy, reported by 18% of women interviewed, seemed also to be a strong motivation to use LARCs, regardless of women's parity. Conversely, we found no link between the use of LARC methods and ever having used emergency contraception (p=0.93). LARC use depended on women's socio-economic circumstances, with unemployed women, women receiving government health care coverage (available for low income individuals) and women reporting difficult financial situations more likely to rely on these methods than others (Table 3). In the multivariate context however, only women's financial situation remained a significant predictor. Closely linked to women's socio-economic status, we found that specialized gynaecological care was associated with higher odds of LARC use (Table 3). Finally, LARC use was associated with only one health indicator in the form of smoking status, while history of STI and obesity were not (Table 3).

The predictors of LARC use by method type (implant or IUDs) were very similar in the univariate analysis. In the multivariate context however, significant factors differed by method type as women's age, financial situation and smoking status were only significantly related to the use of implants, while past unintended pregnancies and type of gynaecological follow-up were only related to IUD use (Table 4). In both cases, parity had a strong influence. A further distinction by type of IUD shows that parity was the only predictor of copper IUD use, while women's age and financial situation were also related to the use of the IUS: the odds of using an IUS were 5 times greater among women 25 to 29 years as compared to their younger peers (OR=5 [1.1-2.7]), and 2.8 times greater in women who reported very difficult financial situations as compared to others (OR=5.0 [1.2-6.5]).

Knowledge and attitudes towards IUDs among the 550 women who responded to these questions were mixed. Half of the women considered the IUDs suited for nulliparous women, 57% believed them not to alter future fertility and 43.3% believed the method was comfortable to use. Conversely, 46% considered the IUDs were not comfortable to use (and 20% didn't know), 44% thought they were not indicated for nulliparous women and 26% believed they could cause fertility problems (another 16%

did not know). Using the combined measure of knowledge, we found none of the respondents gave all 3 correct answers, 36.6% had 2 out of 3 correct answers, 44% has 1 out 3 and the remaining 19.6% provided no correct answers. Knowledge however was not significantly related to LARC use among the selected group of 550 women who responded to these questions nor in the univariate (p=0.39) or in multivariate analysis (p=0.15).

Discussion

In the context of shifting social norms towards delaying childbearing (the mean age at first pregnancy in France is 28), young women in France, as in many developed countries, are in greater need of highly effective contraceptive options for longer periods of time. While LARC methods fulfil these conditions, they remain widely underutilized with little progress made over the last decade: only 6.6% of young women at potential risk of an unintended pregnancy in this study were using such methods in 2010, up from only 2 percentage points since 2000. These results are disconcerting as they point out to the failure of national family planning policies in altering outdated contraceptive norms in France, which contribute to rising abortion rates over the last 20 years among women under 30 (Vilain, 2010). These norms encourage the use of condoms at sexual debut, followed by the pill when individuals establish longer-term relationships, relayed by the IUD mostly used once women have completed their family size. However, they take little consideration of the difficulties women experience in their daily management of user-dependent methods, which have magnifying consequences for young women as they translate in frequent contraceptive discontinuation (Moreau *et al.*, 2009; Vaughan *et al.*; 2009) and higher than expected failure rates (as compared to perfect use failure rates) (Moreau *et al.*, 2007; Kost *et al.*, 2008).

Less than optimal contraceptive choices are not unique to French young women. Despite being part of the national sexual health strategy, the uptake of LARC is also disappointedly low in the UK: 9% of contraceptive users aged 25-29 years opted for these methods, 11% of the 20-24 year age group and 3% of teenagers (Office for National Statistics, 2009). Results from the National Survey of Family Growth in the United States indicate that 11.4% of women ages 25 to 29, 8.3% of 20-24 year old and

4.5% of teenagers use LARC methods, proportions which have significantly improved over the last decade but remain remarkably low as compared to user-dependent methods (Finer *et al.*, 2012).

A growing body of research has explored barriers to LARC use and possible interventions to overcome these obstacles. As reported in a qualitative study among Scottish women, some barriers are hard to surmount, such as the need to see a health professional and the perceived invasiveness of these methods (Glasier *et al.*, 2008). However, misconceptions, about side effects or concerns over future infertility, particularly related to the IUD, as shown in this study and others, also deter young women from using these methods. Some of these myths are largely shared by physicians, who overestimate the risks of infection and ectopic pregnancies and do not recommend IUDs for young nulliparous women (Wellings et *al.*, 2007; Harper *et al.*, 2008; Madden *et al*., 2010). The same observations are true in France, even though the IUD is the second most popular method of contraception: in a recent national survey among 1011 GPs and gynaecologists, 84% of GPs and 69% of gynaecologists reported they would rather not recommend an IUD for nulliparous women (Bajos *et al.*, 2012). The challenges of translating evidence based recommendations into healthcare practices and the lack of insertion skills, evidenced by the lower proportion of LARC users among women who consult a GP as opposed to a gynaecologist, are major drivers of the unique patterns of LARC use among young women, who seem only to consider these methods as they grow older, and after having given birth or more strikingly after having experienced an unintended pregnancy. This later factor was reported in a study of unmarried young women in the US (Dempsey *et al.*, 2012). Women who recognize they have been exposed to the risk of an unintended pregnancy (users of emergency contraception or women who have had an unintended pregnancy) may be particular candidates for LARC methods, which represent the best emergency contraceptive option (in the case of the copper IUD (Cleland *et al.*, 2012)), and the best post-abortive or post-partum option to prevent future unintended pregnancies (Rose *et al.*, 2012; Cameron *et al.*, 2012). Four in ten young women in our study had ever used emergency contraception, but only 6% were current LARC users (and 1% were using copper IUD), revealing the absence of IUD use for EC in France. The lack of opportunity to initiate LARC after an abortion is also evidenced in the recent national abortion survey in France reporting that 23.8% of women underreporting an

abortion received a prescription for LARC after the procedure (and only 11.6% of teenagers) (Moreau *et al.*, 2010; Moreau *et al.*, 2012).

Recent efforts to promote LARC use, reflected in the CHOICE project in the US, demonstrates the potential for substantial increase in use. By providing evidenced based information on all contraceptive options (including LARCs), removing cost barriers and expanding the criteria for LARC eligibility (also offered to nulliparous women and teenagers), the CHOICE project resulted in 67% of women willing to start a new method, choosing LARC methods over other options (Secura *et al.*, 2010). This proportion was remarkably elevated among teenagers, 69% among 14 to 17 year olds and 61% among 18 to 20 year olds (Mestad *et al.*, 2011). The greater use of LARCs among women in financial difficulty in France who are more likely to receive a waiver from the government to avoid paying upfront cost for LARCs (which otherwise would be paid by the women and reimbursed 65% by the national health plan and possibly up to 100% when adding coverage from a complementary private insurance plan) is a sign that cost may still deter young women in instable economic situations from choosing these methods, even in the context of universal health care coverage. Health insurance policies, whether public or private, should reconsider strategies to lift upfront cost of LARCs as an effective measure to reduce longer-term costs of reproductive health services.

This study has several limitations. Most notably, the cross sectional nature of the data does not allow for causal interpretation of the associations described. Prospective studies of contraceptive behaviors, investigating women's positive and negative perceptions of LARCs and the potential financial barriers of use are needed to confirm our findings. The limited information on women's knowledge about LARCs may explain the absence of an association described in earlier (Dempsey *et al.*, 2012), although the cross sectional nature of the study limits the interpretation of such an association in any case. In addition to population-based studies, healthcare provider surveys would also further our understanding of professional barriers to LARC use, including the limited criteria for LARC candidates and the lack of insertion skills, based on our observations. Other professional characteristics should be explored to identify effective strategies to improve contraceptive counselling.

In a context where young people are redefining their reproductive calendars by delaying childbearing to adapt to the socio-economic opportunities and uncertainties of their time, the limited use of highly effective contraceptives is an important failure to meet young women's reproductive needs. Programs to better inform healthcare providers and women about the benefits of LARCs and reduce their financial constraints are urgently needed if we are serious about helping young women make informed contraceptive decisions that best fit their preferences and circumstances.

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Table 1: Sociodemographic and reproductive characteristics of women less than 3 years at potential risk of an unintended pregnancy* by survey year

Sociodemographics		2000 n=1,204	2005 n=1,921	2010 n=1,274	
Age	15-19	10.7%	11.3%	13.7%	0.37
	20-24	41.7%	41.3%	40.45%	
	25-29	47.6%	47.4%	45.8%	
Living with a partner		43.4%	43.6%	43.9%	0.97
Highest diploma	<high school	37.2%	31.4%	39.6%	<0.001
	high school	27.5%	26%	28.9%	
	>high school	35.4%	39.0%	31.6%	
Professional situation	works/on leave	45.7%	40.0%	44.9%	<0.001
	student	33.3%	41.9%	40.3%	
	unemployed	10.9%	10%	10.6%	
	other	10.1%	7.0%	4.2%	
Has children		25.7%	25.2%	20.5%	0.005
Prior abortion		9.6%	9.1%	9.2%	0.91
Current smoker		50.7%	42.3%	44.5%	0.0004
BMI > 30		3.0%	2.0%	5.4%	<0.001
Current use of Contraception	no contraception	3.0%	4.5%	2.2%	
	implant	0%	1.0%	2.6%	
	iud	4.6%	4.1%	3.9%	
	user dependent hormonal methods (pill, patch or ring)	75.9%	76.7%	72.3%	
	condom	12.9%	12.5%	13.5%	
	local/natural methods	3.4%	1.1%	5.6%	

*women at risk were sexually active in the last 12 months, non-sterile, not pregnant or trying to become pregnant

Table 2: Factors associated with LARC use among women less than 30 years at potential risk of an unintended pregnancy* by survey year: results from multivariate logistic regression model

		n	LARC use	p	adjusted OR	95%CI		p
year	2000	1,224	4.6%	0.11	1			
	2005	1,966	5.1%		1.2	0.8	1.8	0.30
	2010	1,279	6.6%		2.0	1.3	3.0	0.001
Age	<20	383	0.4%	0.000	1			
	20-24 years	1,582	2.7%		3.4	1.2	9.9	0.023
	25-29 years	1,965	10.8%		5.3	1.9	14.9	0.002
Parity	no children	3,336	1.1%	0.000	1			
	at least 1 child	1,133	19.4%		14.6	9.9	21.7	0.000
Abortion history	no	4,024	4.3%	0.000	1			
	yes	422	16.8%		2.8	1.9	4.0	0.000
Current smoking status	non smoker	2,385	4.5%	0.005	1			
	smoker	2,010	6.5%		1.6	1.2	2.2	0.002

*women at risk were sexually active in the last 12 months, non-sterile, not pregnant or trying to become pregnant

Table 3: Factors associated with LARC use among women less than 30 years at potential risk of an unintended pregnancy* in 2010: results from multivariate logistic regression model

		n	%	% LARC use	p	OR	95%CI	p
Age	<25 years	282	28.5%	0.5%	0.000	1		0.04
	25 to 29 years	907	71.5%	9.0%		4.7	1.1-20.3	
Cohabitating partner	no	625	53.2%	3.4%	0.000			
	cohabitating partner	564	46.8%	10.3%				
children	none	940	79.0%	2.2%	0.000	1		0.000
	1	144	11.1%	13.9%		3.8	1.9-7.3	
	2 or more	105	9.9%	33.5%		9.6	4.7-19.2	
Unintended pregnancy history	no	990	81.6%	3.1%	0.000	1		0.02
	yes	199	18.4%	22.1%		2.0	1.1-3.7	
Pregnancy intentions	none	131	11.2%	20.3%	0.000			
	in more than 2 years	798	67.1%	4.7%				
	in the next 2 years	259	21.7%	5.1%				
Level of education	<high school	353	39.7%	8.2%	0.09			
	high school graduation	368	28.5%	5.4%				
	up to 3 years of college	293	17.4%	7.3%				
	graduate school	170	14.4%	2.9%				
Profession	works/on	575	45.7%	7.5%	0.000			
	student	456	39.0%	2.2%				
	unemployed	123	11.0%	11.8%				
	other	35	4.3%	24.1%				
Financial situation	no problem	382	32.5%	4.6%	0.000			
	tight	592	48.7%	5.4%		1		0.001
	very difficult	214	18.8%	13.3%		2.5	1.4-4.4	
Health insurance	social security alone	68	6.2%	4.5%	0.007			
	social security and private insurance	1027	83.6%	5.8%				
	universal health plan (government plan for low income)	72	8.3%	17.2%				
	unknow	22	2.0%	2.4%				
Country of birth	mainland	1110	89.7%	6.4%	0.67			
	overseas	20	1.8%	7.5%				
	foreign	59	8.5%	8.8%				
STI in last 5 years	no	1105	93.4%	6.5%	0.65			
	yes	84	6.6%	7.8%				
BMI	bmi<30	1065	94.6%	6.4%	0.33			
	bmi>=30	56	5.4%	10.0%				
Smoking	no	625	55.5%	4.5%	0.003	1		0.006
	yes	501	44.5%	9.2%		2.2	1.3-3.8	
Sex last 4 weeks	no sex	102	8.5%	3.0%	0.002			
	1-4 sex	298	27.2%	3.6%				
	5-9 sex	261	20.9%	6.5%				
	10-14 se	265	21.5%	9.1%				
	15+ sex	214	17.2%	12.0%				
	dt know	48	4.7%	0.0%				
ever used emergency contraception	no	678	56.6%	6.6%	0.93			
	yes	511	43.4%	6.7%				
gynecological visits	none	158	15.9%	2.5%	0.0008	1		

in the last 12 months							
	GP	222	20.5%	3.3%	1.3	0.4-4.2	0.70
	gynecologist	732	63.6%	8.7%	2.8	1.0-7.7	0.05

*women at risk were sexually active in the last 12 months, non-sterile, not pregnant or trying to become pregnant

Table 4: Factors associated with the use of implants or IUDs among women less than 30 years at potential risk of an unintended pregnancy* in 2010: results from multivariate logistic regression models

		% implant	p	OR	95%CI	p	% IUD	p	OR	95%CI	p
Age	<20 years	0.5%	0.030	1		0.04	0.0%	0.002			
	20 to 24 years	3.5%		4.9	1.1-21.6		1.6%				
	25 to 29 years			3.0	0.6-13.7		9.1%				
Cohabitating partner	no	3.3%	0.390				1.2%	0.000			
	yes	2.2%					7.3%				
children	0	1.6%	0.000	1		0.001	0.7%	0.000	1	1	0.001
	1	3.7%					10.1%				
	2 or more	9.5%		3.5	1.6-7.7		24.0%		17.2	7.2-41.2	
Unintended pregnancy history	no	1.5%	0.000				1.6%	0.000	1	0.01	
	yes	7.4%					14.7%		2.4		
Level of education	<high school	3.3%	0.52				5.0%	0.24			
	high school graduation	2.2%					3.1%				
	3 years of college	2.9%					4.3%				
	graduate school	1.1%					1.8%				
Profession	works	2.1%	0.000				5.4%	0.000			
	student	1.7%					0.5%				
	unemployed	3.6%					8.3%				
	other	1.3%					10.9%				
Financial situation	no problem	1.0%	0.040	1		0.001	3.3%	0.130			
	tight	2.3%					3.5%				
	very difficult	6.9%		3.7	1.8-7.8		6.6%				
Health insurance	social security alone	1.0%	0.03				3.5%	0.03			
	social security and private insurance	2.3%					3.5%				
	government plan for low income)	6.9%					10.4%				
	unknow	2.4%					2.4%				
Country of birth	mainland	2.5%	0.9				3.9%	0.66			
	overseas	3.9%					3.6%				
	foreign	3.0%					5.8%				
STI in last 5 years	no	2.5%	0.55				4.0%	0.92			
	yes	3.5%					4.2%				
BMI	bmi<30	2.5%	0.17				3.9%	0.83			
	bmi>=30	5.4%					4.6%				
Smoking	no	1.7%	0.05	1		0.04	2.7%	0.03			
	yes	3.8%		2.3	1.1-5.2		5.4%				
gynecological visits in the last 12 months	none	0.9%	0.15				1.7%	0.003	1	0.03	
	GP	2.2%					1.1%		0.7	0.1-3.7	
	Gynecologist	3.3%					5.4%		2.3	0.7-8.1	

*women at risk were sexually active in the last 12 months, non-sterile, not pregnant or trying to become pregnant