CHARACTERISTICS ASSOCIATED WITH USE OF AN EFFECTIVE CONTRACEPTIVE METHOD AMONG LOW INCOME MOTHERS USING SOME TYPE OF REVERSIBLE METHOD

by

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ABSTRACT

Background: Low income women at risk of unintended pregnancy are less likely to use reversible contraception than wealthier women, and when they do use it, less likely to use it effectively. They also have a higher incidence of unintended pregnancy. Better understanding of characteristics associated with effective contraception may contribute to designing interventions to help women have fewer unintended pregnancies. This topic is particularly relevant today, when many states are implementing or applying for family planning Medicaid waivers to increase coverage for contraceptive services up to the same level as for pregnancy and postpartum services.

Methods: The data source was an Oregon Health Division telephone survey in February 2000 of 606 women who had received Medicaid coverage due to birth conceived during the year before implementation of Oregon's Medicaid waiver, the Family Planning Expansion Project (FPEP). Data from a subset of 308 Caucasian women who were now income-eligible for free contraceptives through FPEP and who were currently using a reversible method were analyzed using univariate, bivariate, and multivariate methods. Hypotheses were that use of an effective contraceptive method is more likely among (1) women whose recent birth was unintended and (2) women who have health insurance; and that (3) the association between health insurance status and use of an effective contraceptive method is stronger than the association for a variable designed to measure "ambivalence" about pregnancy.

Results: Having a recent unintended birth was found to be associated with current use of an effective method in univariate analysis (crude OR 1.8, 95% CI 1.1-3.0) but was not significant in the multivariate model. A significant bivariate interaction

between recent unintended birth and number of children was found; women with one child who had a recent unintended birth were more likely (crude OR 2.4, 95% CI 1.2-4.8) than those with an intended birth to use an effective method. The multivariate model supported the hypothesized association between having health insurance and using an effective method (adjusted OR 3.1, 95% CI 1.7-5.6). The hypothesis that the odds ratio for "ambivalence" about pregnancy would be larger than that for health insurance was neither supported nor excluded due to wide confidence intervals. Among women 25 years old and older, those who were unambivalent about their current desire to prevent pregnancy were more likely to use an effective method than those who were ambivalent (adjusted OR 4.5, 95% CI 1.7-12.0). Ambivalence was not associated with use of effective methods among younger women. Other characteristics in the model were "not cohabiting" (adjusted OR 5.0, 95% CI 1.4-17.6); "birth control gives you a sense of control over your life" (adjusted OR 2.7, 95% CI 1.4-4.9); and for women with one child, "people important to you think birth control is a good idea" (adjusted OR 4.8, 95% CI 1.9-12.0). Younger women were more likely to use an effective method only among ambivalent women (adjusted OR 5.7, 95% CI 2.6-12.5). Among women with less social support for birth control use, having two or more children was associated with use of an effective method (adjusted OR 3.8, 95% CI 1.2-12.5).

Conclusions: The results identify groups of low income Caucasian mothers who may benefit from intervention: women 25 or older who are ambivalent about pregnancy, women with one child and no social support, and cohabiting women. The results also suggest possible intervention approaches, including intervention after an unintended birth, counseling about ambivalence and increasing health insurance coverage.

INTRODUCTION

BACKGROUND AND SIGNIFICANCE

Public Health Significance of Unintended Pregnancy

Almost half (49%) of pregnancies in the United States are unintended; that is, they are unwanted or mis-timed at the time of conception (Henshaw 1998). The U.S. rate is higher than in other industrialized countries, especially for teens, but often for adults as well (Jones et al., 1988, 1985 and Henshaw & Van Vort 1993). Unintended pregnancy is found in all sectors of the U.S. population, with elevated rates among teens (78%), the never-married (78%), blacks (72%), and low income women (61%) (Henshaw 1998).

One consequence of unintended pregnancy is abortion (54% of unintended pregnancies, Henshaw 1998), with its attendant personal ethical dilemmas and political controversy. The other 46% of unintended pregnancies end in birth, with about one-third unwanted and two-thirds mis-timed (Abma et al. 1995). Negative health and social consequences of unintended births identified by the Institute of Medicine in its 1995 report, *Best Intentions,* broadly include inadequate resources for the healthy development of the fetus and child, unnecessary exposure to the risks of childbearing for the woman, emotional and economic hardship for both parents, and financial costs for society (e.g. Medicaid costs) (1995).

Unintended pregnancy is recognized as an important public health problem, despite recent discussions of measurement difficulties (e.g. Trussell et al., 1999) and continuing efforts to understand the exact nature of its association with specific negative health consequences. The National Healthy People 2010 goal is to reduce the rate of

unintended pregnancy to 30%. The Institute of Medicine in *Best Intentions* envisions a social norm of every pregnancy intended at the time of conception.

Progress toward reducing the number of unintended pregnancies requires understanding its causes. The proximal cause of unintended pregnancy is that women and their partners do not practice effective contraception.

Descriptive Studies of Contraceptive Behaviors

Over half (58%) of unintended pregnancies result from the small number of women who are not using any contraceptive method (about 12% of the women at risk of unintended pregnancy). The remainder occur among the large number of women who are using a method, but who do not always use the method effectively. These estimates are based on contraceptive status data from the 1995 National Survey of Family Growth (NSFG) (Table 41 in Abma et al. 1997) and typical 12-month method failure rates reported by Trussell & Vaughan (1999).

Behavior patterns in groups of women with elevated unintended pregnancy rates are distinguished by higher rates of non-use and higher rates of contraceptive failure for methods used. Among low income women for example, Forrest (1994) reports that non-use and failure rates, at 19% and 21% respectively, are about twice the overall population's rates of 10% each. Trussell & Vaughan (1999) report that the risk of pill discontinuation is 39% higher among low income women than among those with higher income. The proportion of women at risk of unintended pregnancy who use an effective method does ***not*** necessarily differ by income, e.g. 42% use the pill in both the <150% Federal Poverty Level (FPL) and >300% FPL groups (Table 44 in Abma et al. 1997). In

fact, data from Oregon's Behavioral Risk Factor Surveillance System indicate that a slightly higher percent of women on Medicaid using a reversible method use an effective method compared to women not on Medicaid (65% vs. 61%, Oregon 1998).

Patterns of contraceptive behaviors have changed over time, as shown in data from the 1982, 1988, and 1995 NSFG surveys (Piccinino & Mosher 1998). The proportion of all women aged 15-44 using any method increased from 56% to 60% to 64%. This included an increase in the use of female sterilization specifically among low income women. Among reversible methods, use of condoms increased for all income groups, from 12% to 15% to 20% (presumably in response to the AIDS crisis), with about 3% in 1995 reporting dual use of condom with a more effective contraceptive method. The hormonal implant and three-month injectible were introduced in the U.S. in 1991 and were used by about 4% of all women (and 6% of low income women) as of 1995. These changes in contraceptive method use may have contributed to the improvement in the unintended pregnancy rate from 57% in 1988 to the current rate of 49% (Henshaw 1998).

Approaches to Increasing Effective Contraception

In order to continue reducing the unintended pregnancy rate, Henshaw (1998) concludes that it is important to improve all behaviors that contribute to effective contraception, which include deciding to use a method, deciding to use a more effective method, obtaining that method, and using it correctly, consistently and continuously.

These behaviors may be affected by both the state of contraceptive technology and the availability and quality of contraceptive services. Women's contraceptive

decisions depend in part on the complex trade-offs inherent in the currently available reversible contraceptive technologies. Older barrier methods are fairly inexpensive and can be obtained without a doctor's appointment, and the condom is an effective method for prevention of sexually transmitted disease. But barrier methods are also coitus-dependent, and typical use results in 8%-32% of women experiencing an unintended pregnancy within the first year (Trussell & Vaughan, 1999). The newer contraceptive technologies have different trade-offs. These methods are all more effective (with a typical failure from 2% to 7% reported by Trussell & Vaughan, 1999) and are all coitus-independent. But they are also more expensive, require a doctor's supervision, may cause side effects and/or health risks, and do not protect against sexually transmitted disease. They vary in duration of action: the IUD can last ten years, hormonal implant five years, and hormonal injection three months, while the pill must be taken every day. New reversible contraceptive technologies continue to be developed, but today no perfect technological solution exists for preventing unintended pregnancy.

Characteristics of contraceptive services can also impact contraceptive behaviors. For example, if contraceptive services are not available, contraceptive choices are limited. Gold (2000) has emphasized the need to improve financial access to services for low income women, and has noted the movement toward family planning Medicaid waivers (currently in fifteen states) which expand the income eligibility level specifically for contraceptive coverage up to the level of programs for pregnant and postpartum women. For example, Oregon's Medicaid program in 1998 provided basic coverage for citizens with incomes up to 100% Federal Poverty Level (FPL), and coverage for pregnant and postpartum women up to 170% FPL. In 1999 a family planning Medicaid

waiver (titled the "Oregon Family Planning Expansion Project" or FPEP) was implemented to provide coverage exclusively for contraceptive services up to 185% FPL. The reasoning behind FPEP and similar waivers is: "Why pay for women's pregnancies, but not for preventing the significant number of those pregnancies that are unintended – especially when the preventive service costs less?"

Other authors have emphasized the need for changes in how contraceptive services are provided. Chetkovich et al. (1999) conclude that traditional approaches to contraceptive services (including the range of contraceptive choices commonly offered and the way messages are framed) no longer fit the patterns of sexual activity of the majority of women, and that better access to emergency contraception and improvements in counseling are needed. The Alan Guttmacher Institute (1994) has suggested that the European practice of integrating contraceptive services into other health care services may have contributed to their lower pregnancy rates for teens (e.g. the teen pregnancy rates in the Netherlands, France, and Germany are 8, 18, and 17 per 1,000 respectively, compared to 79 in the U.S. as reported by Advocates for Youth, 2000). Radecki & Bernstein (1989) found that in the U.S., women using public family planning clinics reported receiving less general medical care and were more likely to express a desire for a different source of contraceptive services than women using private physicians. Regardless of women's preferences, the contraceptive services most available to low income women without health insurance in the U.S. are located in public family planning clinics.

In order to improve contraceptive behaviors and decrease unintended pregnancies, policy makers will continue to discuss how to improve access to and provision of

contraceptive services, new reversible contraceptive technologies will continue to be developed, and researchers will study a variety of characteristics that may be associated with effective contraception.

Analytic Studies of Contraceptive Behaviors

A number of variables – within the broad categories of demographics, perceived susceptibility to pregnancy, knowledge, attitudes about pregnancy and planning, perceived social and other support for contraception, financial access, and contraceptive method and service characteristics – have been previously studied in relation to contraceptive behaviors. This literature review focuses primarily on recent U.S. and selected European studies that (1) examine use of effective reversible contraceptive methods; (2) use a low income population for the sample and/or include income-related variables in the analysis; and (3) include variables which may be considered amenable to relatively short-term change (e.g. financial access and service characteristics). A detailed description of each study is provided in Appendix A. A summary of findings across studies is provided here in both narrative and tabular form. Table 1 lists each variable category, then expresses the independent variables studied within that category as consistently as possible, so that the direction of the significant relationship with a positively expressed outcome variable is easy to interpret across studies. The last column of Table 1 indicates whether each finding applies specifically to low income women and/or to some other demographic group.

Demographics. Women with more children were generally found to be more likely to practice effective contraception, especially if they did not want more children

TABLE 1. Characteristics associated with effective contraception: Findings of previous studies *

Characteristic	Citation	Outcome Variable Measured	Direction of Association**	Independent Variable Measured	Sample Notes
Number of Children	Forrest & Frost (1996)	Use of long lasting method	+	Two or more children & not wanting more	Low income
	Tanfer et al. (2000)	Use of implant	+	Two or more children & not wanting more	
	Spinelli et al. (2000)	Use of effective method	+	Having more children	Age 25+ in Europe
	Tanfer et al. (1992)	Use of contraception	+	High "relative fertility"	Single & 20-29
	Tanfer et al. (1992)	Use of effective method	x	High "relative fertility"	Single & 20-29
Relationship Status	Spinelli et al. (2000)	Use and use of effective	+	Single women	Age 25+ in Europe
	Tanfer et al. (2000)	Use of implant, injectible	+	Formerly married	
	Forrest & Frost (1996)	Use of contraception	+	Never-married (vs. married)	Low income
	Forrest & Frost (1996)	Use of contraception	-	Not cohabiting (vs. married)	Low income
	Condelli (1986)	Use of effective method	-	Not in committed relationship	Low income
	O'Campo et al. (1993)	Use of effective method	-	More than one partner	Low income, Single
	Henshaw (1998)	Intended pregnancy	-	Never-married	
Age	Condelli (1986)	Use of effective method	+	Younger	Low income
	Forrest & Frost (1996)	Use of effective method	+	Age 20-29	Low income
	Henshaw (1998)	Intended pregnancy	-	Teens	
Education	Spinelli et al. (2000)	Use of contraception	+	At least required education level	Age 25+ in Europe
	Forrest & Frost (1996)	Use & use of long lasting	+	At least some college	Low income
	Tanfer et al. (1992)	Use of effective method	-	More education	Single & 20-29
	Tanfer et al. (2000)	Use of injectible, implant	-	College degree	
	Gazmararian et al. (1999)	Use of long lasting method	-	Higher literacy	Low income
Race/Ethnicity	Stephen et al. (1988)	Use of contraception	+	Not Black	
	Tanfer et al. (1992)	Sterilized	+	Black	Single & 20-29
	Forrest & Frost (1996)	Use and use of effective	+	Not Black	Low income
	Forrest & Frost (1996)	Consistent use	+	White	Low income
	Henshaw (1998)	Intended pregnancy	+	Not Black	
Knowledge	Radecki & Beckman (1994)	Use of contraception	-	Lack knowledge of fertility cycle	Low income
	Sable et al. (2000)	Consistent use	-	Lack knowledge of how to get BC	Low income
	Condelli (1986)	Use of effective method	+	Less knowledge about BC	Low income
Perceived Susceptibility	Sable et al. (2000)	Consistent use	-	I didn't think I would get pregnant	Low income ***
	Rainey et al. (1993)	Use of contraception	-	Doubted fertility	Teens only
	Radecki & Beckman (1994)	Use of contraception	-	Lack knowledge of fertility cycle	Low income
	Condelli (1986)	Use of effective method	-	Less perceived threat of pregnancy	Low income

* For a more detailed description of each study, also see Appendix A.

** + = positive association, i.e. for the category of the outcome variable listed, the category of the independent variable listed was found to be more likely than the category of the independent variable not listed.

** - = negative association, i.e. for the category of outcome variable listed, the category of the independent variable listed was found to be less likely than the category of the independent variable not listed.

** x = association was tested but no association was found.

*** This sample was low income women who were seeking a negative pregnancy test at a public health clinic.

TABLE 1. Characteristics associated with effective contraception: Findings of previous studies * (continued)

Characteristic	Citation	Outcome Variable Measured	Direction of Association**	Independent Variable Measured	Sample Notes
Previous Pregnancy Intention	Bulut (1984)	Switch to more effective	+	Previous abortion	Low income, Married, Turkey
	both PSI and Sola (1999)	Improved contraception	+ (qualitative study)	Previous unintended or "scare"	Low income
	Radecki & Beckman (1994)	Use of contraception	-	Previous contraceptive failure	Low income
	Peterson et al. (1998)	Consistent use	-	Previous unintended pregnancy	
	Tanfer et al. (1992)	Use of contraception	-	Previous abortion	Single & 20-29
Attitudes about Pregnancy & Planning	Forrest & Frost (1996)	Use of contraception	-	Very glad if pregnant now	Low income
	Sable et al. (2000)	Consistent use	-	When it's my time, it will happen	Low income
	Chetkovich et al. (2000)	Use of contraception	- (qualitative study)	Ambivalence about pregnancy, skepticism about planning	Low income
Perceived Social & Other Support for Contraception	Forrest & Frost (1996)	Use of contraception	+	Friends think BC is important	Low income
	Sable et al. (2000)	Consistent use	+	Family support	Low income ***
	Chetkovich et al. (2000)	Use of contraception	- (qualitative study)	No time, transportation problems	Low income
	Sable et al. (2000)	Consistent use	-	Too busy, trans. problems	Low income ***
Method Characteristics	Forrest & Frost (1996)	Use of effective method	-	Not very satisfied with method	Low income
	Chetkovich et al. (2000)	Use of contraception	- (qualitative study)	Doubt method effectiveness	Low income
	Condelli (1986)	Use of effective method	-	Doubt method effectiveness	Low income
	Chetkovich et al. (2000)	Use of contraception	- (qualitative study)	Worried about side effects	Low income
	Condelli (1986)	Use of effective method	-	Worried about side effects	Low income
	Sable et al. (2000)	Consistent use	-	Worried about side effects	Low income ***
Service Characteristics	Rapkin et al. (1988)	Satisfaction with method	+	Access to method of choice	Low income
	Grady et al. (1993)	Use of effective method	+	Ready access to services	
	Forrest & Frost (1996)	Use of contraception	+	Very satisfied with last visit	Low income
	Forrest & Frost (1996)	Consistent use	-	Last visit was to public clinic	Low income
	Forrest & Frost (1996)	Use of effective method	+	Very satisfied with last visit	Low income
	Forrest & Frost (1996)	Use of effective method	+	Last visit was to public clinic	Low income
	Forrest & Frost (1996)	Consistent use	+	Very satisfied with last visit	Low income
	Forrest & Frost (1996)	Satisfaction with method	+	Last visit was to public clinic	Low income
Financial Access	Grady et al. (1993)	Use of effective method	-	Low SES	
	Forrest & Frost (1996)	Use of long lasting method	-	Not Medicaid coverage	Low income
	Mauldon & Delbanco (1997)	Don't perceive cost barrier	-	Low income	General Population
	Henshaw (1998)	Intended pregnancy	-	Low income	
	Sable et al. (2000)	Consistent use	-	Perception of cost barrier	Low income
	Chetkovich et al. (2000)	Use of contraception	x (qualitative study)	Perception of cost barrier	Low income

* For a more detailed description of each study, also see Appendix A.

** + = positive association, i.e. for the category of the outcome variable listed, the category of the independent variable listed was found to be more likely than the category of the independent variable not listed.

** - = negative association, i.e. for the category of the outcome variable listed, the category of the independent variable listed was found to be less likely than the category of the independent variable not listed.

** x = association was tested but no association was found.

*** This sample was low income women who were seeking a negative pregnancy test at a public health clinic.

(Spinelli et al. 2000, Tanfer et al. 2000, and a study of low income women by Forrest & Frost 1996). Tanfer et al. 1992 found that high "relative fertility" (current vs. desired total fertility) was associated with use of contraception among single women, but the authors did not find an association for this variable with use of an effective method.

Evidence about the association between relationship status and the practice of effective contraception was mixed. One study of low income women by Forrest & Frost (1996) found that compared to married women, the never-married were more likely to use contraception, but those not cohabiting were less likely to use contraception. Two studies found that low income women in a "committed sexual relationship" (Condelli 1986) or with only one partner (O'Campo 1993) were more likely to use an effective method. But two other studies found that single women (Spinelli et al. 2000) or formerly married women (Tanfer et al. 2000) were more likely to use an effective method. The differing results may be explained by differing needs of effective contraception vs. effective protection against sexually transmitted disease, and suggest the association between relationship status and effective contraception is not clear-cut.

Younger women are more likely to use an effective contraceptive method than older women, according to studies of low income women by Condelli (1986) and Forrest & Frost (1996).

African American women were found to be less likely than Caucasians to use contraception (Stephen et al. 1988 and Forrest & Frost 1996) and less likely to use an effective contraceptive method (Forrest & Frost 1996), after controlling for demographic variables including education and work status.

Women with more education were found to be more likely to use contraception (Spinelli et al. 2000 and a study of low income women by Forrest & Frost 1996). On the other hand, for the outcome variable of use of a more effective method, Tanfer et al. (1992) found it was associated with less education. For use of long-acting methods, associations were found with low literacy (Gazmararian 1999) and having less than a college degree (Tanfer et al. 2000).

Knowledge. Consistent with findings about education (Gazmarian et al. and Tanfer et al.), Condelli (1986) found that lack of knowledge (in this case about contraception) among low income women was associated with choice of an effective method. On the other hand, Radecki & Beckman (1994) and Sable et al. (2000) found that among low income women, lack of knowledge of the fertility cycle and of where to get birth control was associated with non-use or inconsistent use of contraception.

Perceived Susceptibility to Pregnancy. The evidence clearly showed an association between lack of "perceived susceptibility to pregnancy" and less effective contraception (Rainey et al. 1993, and low income studies by Condelli 1986, Radecki & Beckman 1994 and Sable et al. 2000). For women who have demonstrated their susceptibility to having an unintended pregnancy by having one, the evidence was mixed depending on the recency of the event and the outcome measure used. Bulut (1984), PSI (1999) and Sola (2000) found evidence that after a recent previous unintended pregnancy experience low income women switch to a more effective method. But Tanfer et al. 1992, Peterson et al. 1998 and a low income study by Radecki & Beckman (1994) found that women with an unintended pregnancy in their history were more likely to continue to not use contraception or to do so inconsistently.

Attitudes about Pregnancy and Planning. Forrest & Frost (1996), Chetkovich et al. (1999) and Sable et al. (2000) all found that attitudinal measures of ambivalence toward pregnancy and skepticism about planning and contraception may be negatively associated with use of contraception or consistent use, but did not specifically find an association with use of an effective method.

Perceived Social and Other Support for Contraception. Social support has been found to be associated with use of contraception (Forrest & Frost 1996) and consistent use (Sable et al. 2000). Being "too busy" or having "transportation problems" were identified in qualitative research as barriers to contraceptive use for low income women (Chetkovich et al.1999), and were found to be statistically significantly associated with inconsistent use (Sable et al. 2000). No studies of these variables in relationship to the outcome variable of "use of an effective method" were reviewed.

Method and Service Characteristics. Concern about side effects and doubts about method effectiveness were suggested as barriers to not using contraception (Chetkovich et al. 1999), and found to be associated with inconsistent use (Sable et al. 2000), and not using an effective contraceptive method (Condelli 1986). Satisfaction with method was found to be associated with use of an effective method (Forrest & Frost 1996). Problems with access to one effective method (the IUD) were found to be associated with less satisfaction with method used (Rapkin et al. 1988), while ready access to services was associated with use of effective methods (Grady et al. 1993). Satisfaction with gynecological services was found to be associated with use of contraception, consistent use, and use of an effective method (Forrest & Frost 1996). Receiving services at a

public clinic was associated with more use of an effective method and satisfaction with method, but not consistent use of a method (Forrest & Frost 1996).

Financial Access. Financial access to services was associated with effective contraception (Delbanco et al. 1997, Mauldon & Delbanco 1997, Grady 1993, and studies of low income women by Sable et al. 2000 and Forrest & Frost 1996). The relative importance of financial access (compared to ambivalence about pregnancy and planning, doubts about method effectiveness, and concerns about side effects) was questioned in a qualitative study of low income women by Chetkovich et al. (1999).

RESEARCH OPPORTUNITY

Oregon's Medicaid Waiver

An opportunity to further elucidate characteristics associated with the practice of effective contraception arose in January 1999, when the Oregon Health Division (OHD) and the Oregon Medical Assistance Program (OMAP) implemented a Medicaid waiver titled the Family Planning Expansion Project (FPEP). FPEP increased Medicaid coverage from the basic coverage level of 100% of the Federal Poverty Level (FPL) to 185% FPL exclusively for contraceptive services, and initially provided these services through the statewide network of public family planning clinics. FPEP also included a social marketing campaign based on formative research: a literature review, qualitative research, and a quantitative cross-sectional telephone survey designed and implemented in February 2000 by a research team at the Oregon Health Division (OHD), with this author as a member of that team. The OHD study was designed for two primary purposes: to better understand the etiology of unintended pregnancy and to describe

groups of women according to their readiness to use public clinic services. The survey results can also be used to study effective contraception.

The OHD FPEP telephone survey provides a valuable research opportunity because of its questions and subjects. The OHD study subjects are low income women, a group identified in the literature as high risk for unintended pregnancy. They are specifically women with recent births, a sub-group not studied in previous research. They also provide a different perspective because they are women with recent births conceived before implementation of Oregon's family planning Medicaid waiver, who are now eligible for free contraceptives at family planning clinics under that waiver.

The OHD survey questions measured a number of the variables identified in the literature review: demographics, past experience of an unintended pregnancy, attitudes about pregnancy, planning, and contraception – including "ambivalence" about pregnancy – social support, attitudes about method and service characteristics, and financial access to contraceptive services. In addition, the OHD survey contained two questions that were not studied in the reviewed literature: questions about knowledge of and interest in use of emergency contraception.

The variables of financial access to contraceptive services, ambivalence about pregnancy, and past experience of an unintended pregnancy are of particular interest for FPEP because of two previously reported findings. First, qualitative research conducted for the FPEP social marketing campaign showed that having an unintended pregnancy might motivate women toward effective contraception (PSI 1999 and Sola 2000), but results reported in published quantitative studies were equivocal. It is important to clarify this issue to prioritize resources for interventions around unintended pregnancy.

Second, improving financial access to contraceptives is the premise for FPEP, but the Chetkovich et al. (1999) study suggested that other issues, including ambivalence about pregnancy, might have more influence on contraceptive use. It is important to confirm how important financial access is for use of an effective method, and also to make use of information about any other issues that could be useful for the FPEP social marketing campaign.

Analysis of these and other variables from the OHD survey may contribute to knowledge for FPEP's social marketing campaign. It may also contribute to knowledge beyond the Oregon setting to other states' family planning Medicaid waivers, to national Medicaid policy, and to contraceptive services for low income women in general.

Design Rationale

To study the practice of effective contraception using the OHD survey, slight changes and choices within the OHD research design are needed. While details specific to subject selection and outcome variable definition for this thesis are presented in the Methods Section, the rationale for the generalized research design based on a literature review is described here.

The OHD study looked at a cross-section of all women, including women of all races. Because previous research on contraceptive behavior has found important differences by race (e.g. Stephen et al. 1988 and Forrest & Frost 1996), and because the OHD sample does not have enough non-Caucasian subjects to adequately control for differences, the **subjects** were restricted to Caucasians.

The subjects should be further restricted to women who were currently using a contraceptive method because non-users have very different characteristics from users (Morrison 1989). In *Best Intentions* the Institute of Medicine (1995) also suggests that strategies to help non-users and users may be very different. On the other hand, a number of authors, including the Institute of Medicine, discuss the fact that women alternate between the user and non-user categories, and Chetkovich et al. (1999) suggests that unpredictability of relationships/sexual intercourse is an important contributor to unintended pregnancy. Stephen et al. (1988), Kahn et al. (1990) and Tanfer et al. (1992) suggest that the decision to use a method and to use a particular method is a joint decision, so they include women not using a method in their study samples and use three categories (non-use, IUD/pill, and other) and polytomous logistic regression to model the outcome. The final consideration is that the OHD sample is not large enough to use a three-category outcome variable, so rather than lump the small number of non-users with users, non-users were excluded to reduce variability.

The OHD study included three measures of effective contraception: use/non-use, choice of method, and consistent use. However since non-users were excluded, "use/non-use of contraception" was not a candidate for the outcome variable. An outcome variable of "consistency of contraceptive use" was possible, but not highly recommended because the OHD measure was not a tested one. The remaining **outcome variable** for measuring effective contraception was "use of an effective method."

The usefulness of studying the outcome variable "use of an effective contraceptive method" for understanding unintended pregnancy prevention may be questioned, considering that the distinguishing characteristics of women with a high

prevalence of unintended pregnancy are "less use" and "less consistency," not "less effective method." But greater use of effective methods compensates for less consistency to some degree. The impact of using more effective methods can be sizeable. Women using less effective methods (barrier and other methods) represent about 42% of the women at risk of unintended pregnancy and 26% of unintended pregnancies; women using more effective methods (IUD and hormonal) represent about the same portion of the women at risk of unintended pregnancy (46%), but a significantly smaller portion of the unintended pregnancies (16%). In other words, the rate of unintended pregnancy is about 1.8 times higher among women using less effective methods compared to those using more effective methods. All of these estimates are based on contraceptive status data from the 1995 NSFG (Table 41 in Abma et al. 1997) and typical 12-month method failure rates reported by Trussell & Vaughan (1999).

Conceptual Model

Variables from the OHD survey which correspond to those in the literature can be used in a general conceptual model of the preconditions for a woman to choose an effective contraceptive method (first and second columns of Table 2, next page): First the woman has a desire to not be pregnant. She perceives that she is susceptible to pregnancy, and she believes she can and should control her fertility. She feels she has enough social support for using effective contraception. She knows that contraceptive methods and services are available, and believes she can use them. Services are in fact available, and she has financial access to them. She accesses the services and the provider of the services helps her find a method that works for her. If she feels she needs

TABLE 2. Elements of conceptual model in relation to variables from both literature review and Oregon Health Division survey

Conceptual Model Element	Category of Variable in Literature Review	OHD Variable Available
Want to have a child?	Attitude about pregnancy	Agree want children in future? Agree pregnancy would interfere? Agree OK if pregnant?
	Demographics	Number of children Relationship status Age
Perceive susceptibility to pregnancy?	Current perception of susceptibility Past experience of unintended pregnancy	(None measured) Intention status of recent birth
Believe you can and should control your fertility?	Attitude about planning	Agree better to plan? Agree if pregnant, meant to be?
Know methods and services are available?	Demographics	Education
	Specific knowledge about methods Specific knoweldge about services	Know about emergency contraception? (None measured)
Perceive ability to effectively contracept?	Perceived ability to effectively contracept	Agree people important to you think birth control is a good idea? Agree birth control gives you a sense of control? Agree too busy to use birth control? Agree could talk to a provider about a problem? How important to have public transportation?
Can afford service and method?	Financial Access	Have health insurance? Have public health insurance? Have health insurance for birth control? Use public family planning clinic service? Income less or more than 100% fpl before recent birth? Enrolled in WIC?
Any method characteristics that impact your decision?	Method characteristics: negative (e.g. medical contra-indications, side effects, lack of STD protection)	(None measured)
	Method characteristics: positive	How important that effective method gives you peace of mind? How important that you don't have to interrupt sex when you use an effective method? Likely to use emergency contraception?
Any service characteristics that impact your decision?	Service characteristics: negative (e.g. service doesn't exist, or full range of methods not offered)	(None measured)
	Service characterstics: positive	Use public family planning clinic? How important: childcare at clinic? easy to make appt. over phone? evening or Sat appointment? reminder call for appointment? follow-up call to see how you're doing? clean clinic? waiting time of less than 15 minutes? service provider keeps info private? service provider listens & responds? service provider respects you?

to use a condom for disease protection, she is willing to use a second method that is more effective for preventing pregnancy. She has no medical contra-indications for an effective method, and is not overly concerned with possible side effects. She chooses to use an effective method.

The items on the OHD survey fit into this conceptual model as shown in the last column of Table 2 on page 17 and described here. The woman's desire to not be pregnant may depend on how many children she has now, whether she wants a child in the future, and how ready she is for a child right now. Whether a pregnancy would be okay or would interfere in her life may in turn be affected by other demographic variables including her age and relationship status. A direct measure of her perception of susceptibility to pregnancy is not available in the OHD survey, but perceived susceptibility may be affected by a past experience of demonstrated susceptibility – specifically a recent unintended birth. The woman believes it is better to plan when and how many children to have, rather than feeling that it is up to fate. Her level of knowledge about contraceptive methods and services is not assessed in detail in the OHD survey, but one question measures knowledge of emergency contraception and another measures education level. If she did for some reason have unprotected intercourse, she would be likely to use emergency contraception to prevent pregnancy. People important to her think contraception is a good idea, and she feels contraception provides a sense of control over her life. She does not feel she is too busy to use contraception, and feels that if she had a problem with her method, she could talk to her provider. A variable about "how important" it is to have public transportation to a clinic is included in the OHD survey. The woman has sufficient income or health insurance for accessing services, or

she uses free services such as the Women, Infant, and Children's nutrition program (WIC) and/or public family planing clinic services. Questions about negative aspects of method characteristics (such as side effects, health risks, or lack of protection from sexually transmitted disease) are not included in the OHD survey. Questions about positive aspects of method characteristics and service characteristics are asked in the form of "how important" the characteristics are.

Research Question, Objectives and Hypotheses

The OHD survey provides an opportunity to answer the **research question** for this thesis: "Among low income Caucasian women in Oregon who received Medicaid coverage due to a recent birth and who are using a reversible contraceptive method, what are the factors associated with use of a more effective contraceptive method?"

The **objectives** of the thesis are: (1) to describe the characteristics of this group of women with a high incidence of unintended pregnancy; (2) to identify which of the measured variables are associated with more use of an effective method in this population; and (3) to test three hypotheses.

The findings from formative research for Oregon's FPEP social marketing campaign and the findings of the literature review for this thesis provided the impetus for the hypotheses. The **hypotheses** are that use of an effective contraceptive method is more likely among (1) women whose recent birth was unintended and (2) women who have financial access to contraceptive services; and that (3) the association between financial access and use of an effective contraceptive method is stronger than the association for a variable designed to measure "ambivalence" about pregnancy.

METHODS

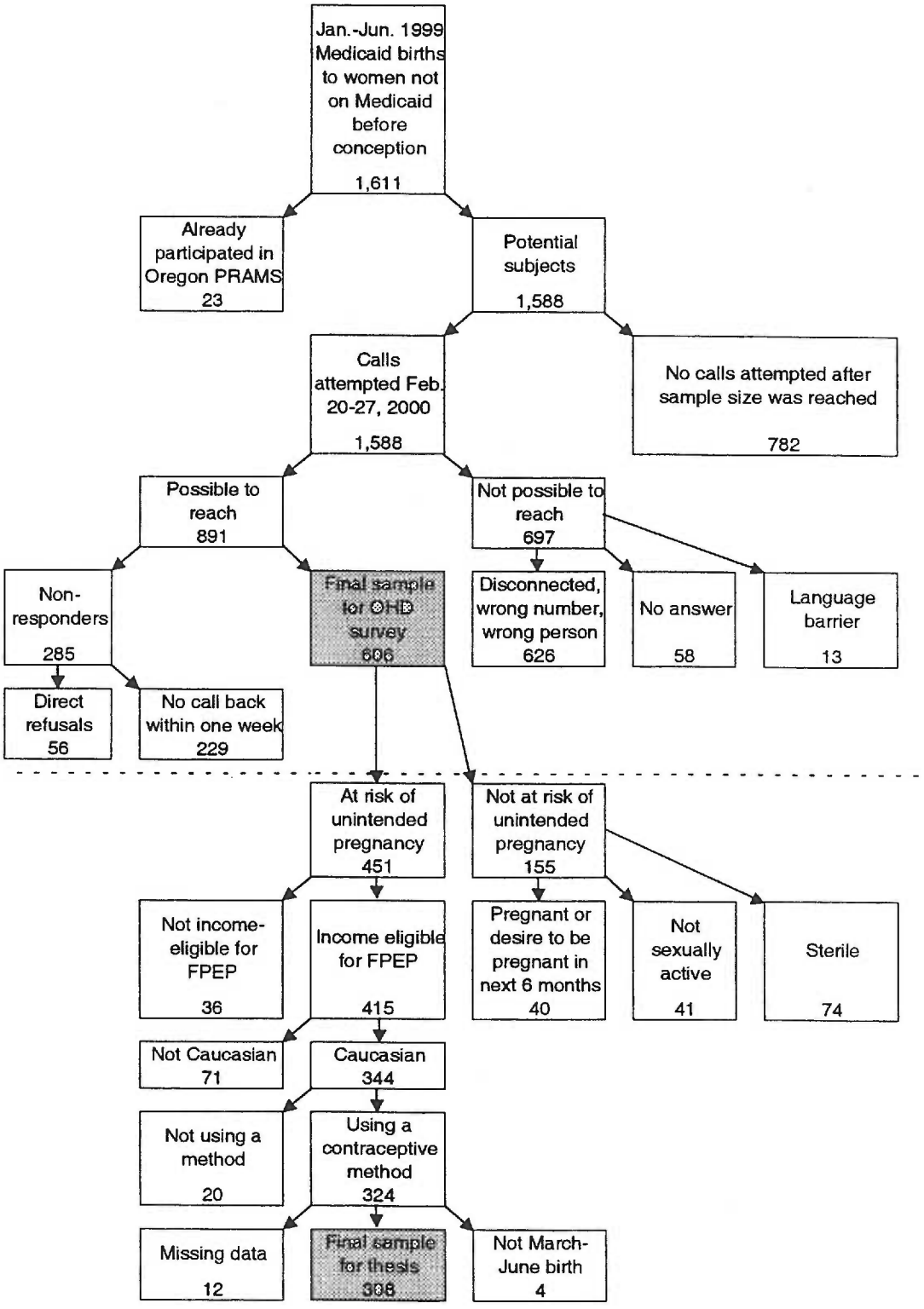
The subject selection and measurement methods for the Oregon Health Division (OHD) study on which this thesis is based were designed by the OHD's Family Planning Expansion Project (FPEP) Social Marketing Research and Evaluation Team (SMRET). The SMRET team included the author of this thesis as the OHD research analyst, and Allison Mobley and Alex Lowell of Population Services International (PSI), the private non-profit organization contracted to conduct the OHD study. Also at the OHD, Jeanne Atkins and Lesli Uebel provided management and direction for the team, and Mike Stark provided technical consultation.

PSI (2000) wrote a one-page summary of the subject selection and measurement methods for the OHD study, but a revised and more detailed description of the OHD subject selection and measurement methods is provided below, with any specific work by the author noted. Additional subject selection criteria and variables calculated specifically for this thesis were designed by the author and are described under the sections labeled "Final Sample" and "Final Variables." All of the analysis methods for this thesis were designed independently by the author.

SUBJECTS

The subject selection process is described in detail below, and a summary is shown in Figure 1 on the following page.

FIGURE 1. Subject selection process: Disposition of potential subjects, including final samples for OHD study and thesis study



Obtaining the Potential Subject List

Subjects for the OHD study were limited to women with a recent Medicaid birth who had not accessed coverage before conception, but who were now eligible for Medicaid-covered family planning services based on having incomes of 185% of the Federal Poverty Level (FPL) or below. This included women above the eligibility level for basic Medicaid in Oregon, 100% FPL, plus any women who were below 100% FPL but for whatever reason did not have basic coverage before conception.

A complete census of births paid for by Medicaid was available through interagency cooperation from the Oregon Medical Assistance Program (OMAP), and the data were exempted from full review by the OHD Institutional Review Board based on their use for program planning. Births occurring in the six months between January and June 1999 were thought to be adequate to meet the final OHD study sample size goal of 600 (which assured that descriptive data for the total sample would have a margin of error of +/- 4% using a 95% confidence level).

The author made a request to OMAP for a file of names, addresses, and phone numbers for women who gave birth in that time frame and who had not been on Medicaid nine months before the birth. The file also included the date of the recent delivery paid for by Medicaid, and an indication of whether the woman's income was above or below 100% FPL at the time she enrolled in Medicaid.

After removal of duplicates by the author, 2,393 potential subjects were identified. Twenty-three women who had already participated in Oregon's Pregnancy Risk Assessment and Monitoring System (PRAMS) were excluded so they would not have to fill out a second survey. The final potential subject list included 2,370 names.

Reaching the Subjects

Staff of Adult and Family Services (AFS determines eligibility for Oregon's welfare programs) were alerted to the upcoming telephone survey by letter on February 11, 2000. A letter to potential subjects was mailed the next week to alert them that they might be called to participate in the survey. Over the course of the next few weeks, 202 of the letters to potential subjects were returned as undeliverable, but this did not impact calling protocol.

The author assigned priority numbers to each of the 2,370 potential subjects based on recency of the birth, to reduce recall bias and with the idea a census of 600 of the most recent births was preferable to a sample spanning the entire six month period. Thus the first priority was for the most recent births (i.e. those born in May and June) the second priority was March and April births, and the third priority was January and February births.

The file was then given to Clearwater Research, the telephone interviewing contractor hired by PSI. The calling protocol was similar to that used in Oregon's Behavioral Risk Factor Surveillance System (BRFSS), which reduces non-response bias by calling the same number up to15 times to get a response (or refusal). Modifications to the BRFSS protocol were made based on consultation with Kara Harder at Clearwater Research to reach the goal of 600 subjects in a short time frame. The BRFSS standard of up to 15 calls per phone number was maintained except that once 600 subjects were reached, re-calling stopped. The BRFSS standard of waiting 180 minutes before re-calling "busy," "no answer" or "answering machine" dials was cut in half to 90 minutes, and the BRFSS standard of waiting 8 days before re-calling refusals was cut to 2 days.

Telephone interviews were conducted by Clearwater Research between February 21 and 27, 2000. From the potential sample of 2,370, phone calls were attempted until the desired sample size was reached. Out of 1,588 phone calls attempted, 39% were wrong or disconnected phone numbers, 4% had no answer, and 1% had a communication barrier (for example language other than English or Spanish). The remaining 891 or 56% of the women could be reached. Only 6% of those reached directly refused to participate, and another 26% who were asked to call back did not do so within the one-week calling period. The remaining six hundred six women, with recent births that occurred primarily between March and Jun 1999, completed surveys. These 606 women represent a 68% response rate from the women who could be reached.

The proportion of women with income at Medicaid eligibility screening less than 100% FPL in the final OHD sample was similar to that of the attempted call sample and the initial potential sample: 51%, 52% and 51% respectively. Income level was the only variable available for comparison among these groups.

The top section of Figure 1 (page 22) summarizes the subject selection process from the initial potential sample to 606 completed OHD surveys.

Final Sample

The bottom section of Figure 1 (page 22) shows the subject selection process from 606 completed OHD surveys to the final sample of 308 for this thesis. The 606 women in the OHD survey were women who: received Medicaid coverage due to a birth occurring within the last twelve months but conceived before the implementation of FPEP in January 1999 and who had not been enrolled in OHP at conception; had not

already participated in Oregon's PRAMS survey; spoke either English or Spanish; and were reached by phone during a one week period in February 2000. Of the 606 subjects in the OHD study, 324 met the following additional criteria for this thesis: "at risk of unintended pregnancy;" "low income" at the time of the survey; using a reversible contraceptive method; and Caucasian. "At risk of unintended pregnancy" was defined as being fertile and sexually active and not pregnant or desiring to be pregnant in the next six months. "Low income" was defined as being enrolled in the Women, Infant and Children nutrition program (eligibility criteria for WIC is 185% FPL) or having an income less than 185% FPL based on gross monthly income and family size.

Four subjects were deleted so that the sample contained only March-June births. Twelve subjects were deleted because of missing data. The final sample size was 308.

MEASUREMENTS

The measurement process from telephone survey design to selection and calculation of the final variables is described below. The final variables and their sources are also summarized in Table 3 on page 29.

Telephone Survey Design

A 15-minute time limit for the survey was imposed for the sake of both the patience of the subjects and the constraints of the OHD budget. Only single representative questions were used for some concepts that might have been more reliably measured using multi-question scales. Skip patterns were created to ask each woman only the questions most relevant to her.

The initial draft of the survey was created by PSI, then the SMRET team worked together to review, prioritize and revise the survey content. After the survey was in final draft, PSI translated the English version into Spanish.

PSI pre-tested the draft measurement instrument in person or on the phone with nine women aged 20-30 from four racial/ethnic groups (Caucasian, African American, Native American, Hispanic). PSI made slight adjustments after pre-testing.

The final survey contained approximately 90 questions and is reproduced in Appendix B. The survey questions are numbered and labeled with a letter indicating what type of question is asked: Section "S" contains yes/no screening questions regarding income and fertility; Section "A" contains yes/no and multiple choice questions about public clinic service use; Section "B" asks about the importance of selected service features, using a scale from 1 (very important) to 5 (not all important); Section "C" measures level of agreement (completely agree, somewhat agree, somewhat disagree or completely disagree) with statements about pregnancy, planning, and birth control; Section "D" asks about contraceptive behaviors, the importance of selected method features, and knowledge and likeliness (very or somewhat likely or unlikely) of using emergency contraception; Section "E" asks questions about the recent birth, including pregnancy intention at time of conception; and Section "F" contains questions about demographics.

Data Management

Responses were recorded using computer-aided telephone interviewing (CATI) software to manage and monitor calling, control distribution of the sample, and to make

data entry efficient. The data were appended to the original data file from OMAP. Clearwater Research then edited, prepared, and delivered the file to PSI, who later delivered it to OHD.

Personal identifiers including names, addresses, and phone numbers were removed from the file by OHD before the data were used for this thesis. The OHSU Institutional Review Board determined this project to be exempt.

Final Variables

A list of final variables used for this thesis is provided in Table 3 (on the next page) with references to the source of each variable. All measurements were obtained from the OHD telephone survey instrument (see Appendix B) with the exception of the eligibility category of each woman at the time of her recent Medicaid enrollment (which was a variable in the original data file from OMAP). The eligibility categories were below 100% FPL (the eligibility level for full Medicaid coverage in Oregon) and between 101% and 170% FPL (Oregon's eligibility range for Medicaid coverage for pregnant and postpartum women).

Most variables were taken from individual survey questions. Variables requiring more than obvious "calculation" from multiple survey questions are described below.

Outcome variable. "Use of an Effective Contraceptive" was defined as use of a method with a typical failure rate of 7% or less. This includes all coitus-independent methods listed in Question D1, specifically the IUD and the hormonal methods of the pill, injection, and implant.

TABLE 3. Summary of analysis variables from OHD survey and definitions of calculated variables for thesis

Category	OHD Variable Available	Question Number	Calculated Variables *
Contraceptive behaviors	Method(s) used before unintended pregnancy	E2	
	Main method used after birth	D1	Outcome variable: Use of an effective method = D1 categories of IUD and all hormonals
	Consistency of use for pill, injectible, condom, and diaphragm	D2, D3, D6, & D7	
	Likely to change methods in next 6 months?	D10	Plan to change to a less or more
	What method are you likely to change to?	D10a	effective method (D1, D10 &
	Likely to use emergency contraception?	D18c	
Demographics	Number of children	F2	** a, b
	Relationship status	F4	
	Age	F1	
	Education	F5	
Attitudes about pregnancy & planning	Agree want children in future?	C3	** a
	Agree pregnancy would interfere?	C4	** b and Ambivalence (C2 & C4)
	Agree OK if pregnant?	C2	** b
	Agree better to plan?	C6	** c
	Agree if pregnant, meant to be?	C7	** c
Past experience of unintended pregnancy	Level of wantedness of recent birth	E1b	Unintended birth (E1b & E5)
	Timing of recent Medicaid birth	E5	
Knowledge	Anything a woman can do to prevent pregnancy after unprotected intercourse?	D18	Knowledge of emergency contraception (D18 & D18b)
	Know about emergency contraception?	D18b	
Perceived ability to effectively contracept	Agree people important to you think birth control is a good idea?	C12	
	Agree birth control gives you a sense of control?	C10	
	Agree too busy to use birth control?	C9	
	Agree could talk to a provider about a problem?	C11	
	How important to have public transportation to clinic?	B3	
Financial access	Have public health insurance?	F6	Health insurance status
	Other insurance?	F6i	(F6, F6a & F6i)
	Other insurance pay for birth control?	F6a	
	Use public clinic service in past year?	A1	
	Likely to use public clinic service in the next 6 months?	A2	Public family planning clinic status (A1 & A2)
	WIC status	S2	
	Income < or > than 100% fpl before birth?	OMAP data	Any financial access (F6, F6a, F6i, A1)
Method characteristics	How important that effective method gives you peace of mind?	D11f	
	How important that you don't have to interrupt sex using effective method?	D11g	
Service characterstics	How important:		
	childcare at clinic?	B4	
	easy to make appt. over phone?	B1	
	evening or Sat appointment?	B2	
	reminder call for appointment?	B10	
	follow-up call?	B12	
	clean clinic?	B5	
	waiting time of less than 15 minutes?	B6	
	service provider keeps info private?	B8	
	service provider listens & responds?	B9	
	service provider respects you?	B7	

* In addition to these calculations, multi-category variables were collapsed for logistic regression (see Tables 4 8, Results section), and further combined variables a, b and c (component variables marked with ** above) were explored but were not found to be associated with the outcome variable.

Unintended birth. An "unintended birth" was defined as a birth that was either unwanted or mistimed at the time of conception. The variable was calculated based on answers to two questions in Section E. Women were asked to think back to the time of conception of their recent birth. Question E5 is a standard question used in Oregon's BRFSS and PRAMS surveys that asks "How did you feel about becoming pregnant?" A woman who answered E5 that she "wanted to be pregnant later" or "did not want to be pregnant then or at any time in the future" was recorded as having had an unintended pregnancy. A woman who indicated in Question E1b that she completely disagreed she wanted to be pregnant was also recorded as having had an unintended pregnancy.

Ambivalence about Current Desire to Prevent Pregnancy. None of the women were trying to get pregnant in the next six months, as determined by their answer to Screening question S4. But some of the women seemed ambivalent about pregnancy – they agreed it would be okay if they got pregnant now (C2) and/or did not completely agree a pregnancy would interfere (C4). "Unambivalent" women were those who either completely disagreed a pregnancy would be okay or completely agreed it would interfere.

Financial Access. The variable "public health insurance" was measured in question F6. In order to measure "any insurance," the answers to F6i were added to F6. The measurement of "insurance coverage of contraceptives" was based on question F6a and the fact that those with public health insurance (question F6) are covered for contraceptives. A summary variable of ***any*** type of "financial access" also included use of the free or low cost services provided by public clinics (question A1).

ANALYSIS

Univariate and Bivariate Analysis

Univariate and bivariate analyses used the Statistical Package for the Social Sciences (SPSS) version 9.0 provided through OHD's group license. First, frequencies were generated for all of the variables. Next the relationship between each variable and the outcome variable was examined. Continuous independent variables were examined with t-tests and univariate logistic regression, including Box-Tidwell transformation to test which relationships may not be strictly linear (Box & Tidwell, 1962). Since all of those relationships were found to be non-linear, continuous variables were then re-coded into categorical variables for the remainder of the analyses.

The relationship between each categorical variable and the outcome variable was examined in cross-tabulation and with univariate logistic regression. Categorical variables were collapsed where appropriate to reduce the number of response categories. Collapsing of categories for each variable was primarily based on common groupings reported for the variable in the literature, with secondary consideration of the variable's relationship to the outcome variable.

For variables measuring level of agreement (questions in Section C of survey), importance (questions in Section B and D11f-g), and likelihood (question D18c), a uniform approach to collapsing categories was chosen. The approach was to compare the extreme category assumed to be associated with use of an effective method (which was also generally the answer given by the majority of women) to the other categories grouped together. This decision was based on the idea that associations between attitudes and the behavioral outcome of interest might be detectible and/or important only when

women felt very strongly about an issue. For some questions (Section B) no association with the outcome variable was assumed. All of these variables were re-coded with the extreme answer given by the majority of the women as one category vs. all the other categories grouped together.

Relationships between independent variables were examined for those independent variables related to the outcome variable at a .25 level of significance for the likelihood ratio test (Hosmer & Lemeshow 1989) and/or of interest based on theoretical grounds. Correlations between independent variables were measured with a symmetric probabilistic measure appropriate for ordinal tables, the gamma statistic (Agresti, 1990). Correlations were considered notable at gamma >.30 with a significance level of .10. For variables that might measure similar or related concepts, combination of variables was explored (for example the component parts of the "ambivalence" variable). Other variables were examined for confounding in bivariate logistic regression, with a 10% change in the odds ratio as the cut-off point (Hosmer & Lemeshow, 1989). Possible interactions between pairs of independent variables including a demographic variable with the outcome variable were examined in stratified tables using the Breslow-Day test of homogeneity with a significance level of .10.

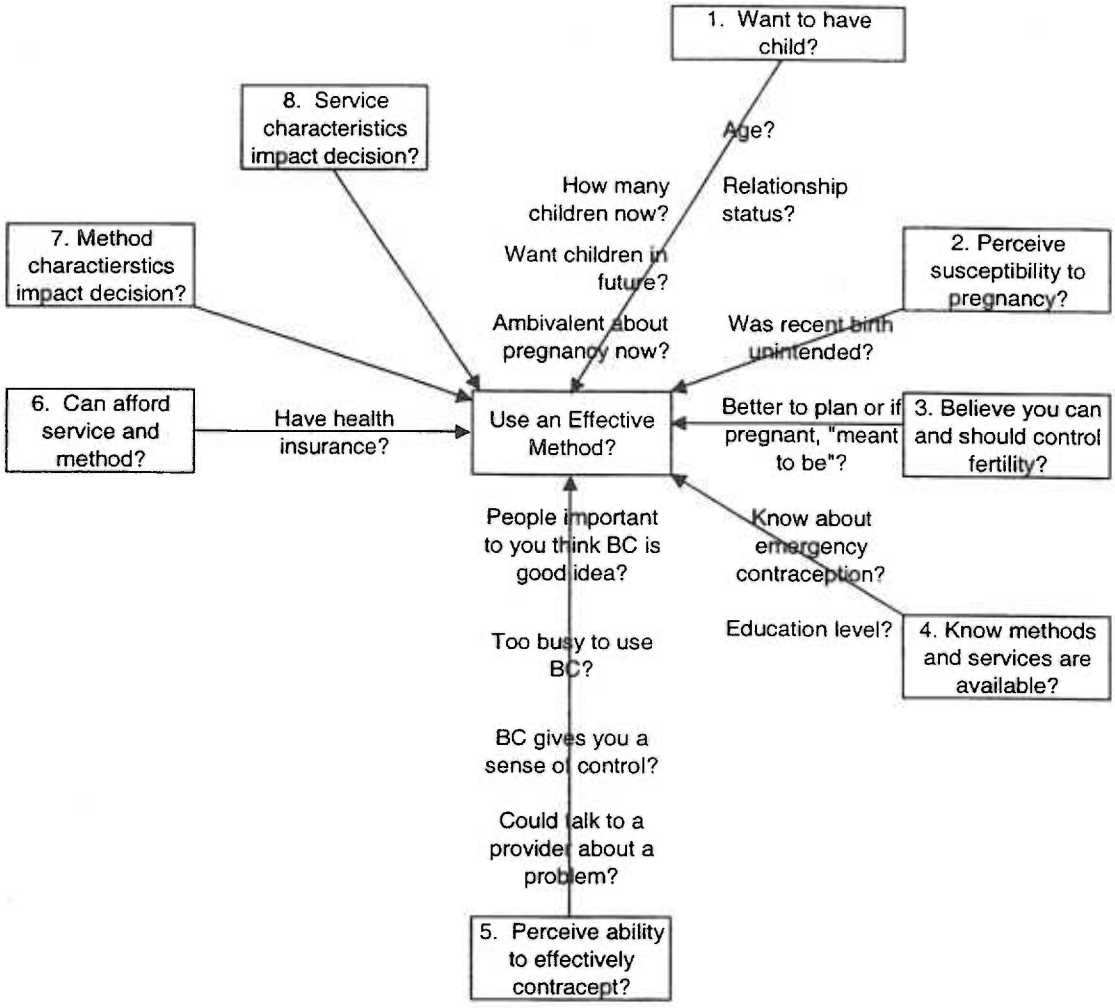
Multivariate Logistic Regression

While all variables listed in Table 3 (page 29) were examined in univariate analysis, the following were excluded from multivariate analysis for the reasons listed in parentheses: (1) variables based on a measurement of "importance" of a method or service characteristic (difficult to interpret); (2) variables measuring consistency of

contraceptive use and likelihood of using emergency contraception (alternate outcome variables, not independent variables); (3) the variable "method used before the recent birth" (not available for all subjects and could be equivalent to outcome variable); and (4) the variable "public clinic use in the past year." The latter variable was excluded because the only way to get an effective method is to go to some type of provider, so to some degree, clinic use is synonymous with the outcome.

Figure 2 (next page) shows the variables considered for multivariate modeling based on theoretical grounds. Modeling began by considering the variables significant in univariate logistic regression where $p<.25$ for the likelihood ratio test (Hosmer & Lemeshow, 1989). Scaling of variables was chosen based on statistical appropriateness (e.g. linearity of continuous variables and cell size of categorical variables), public health interest, and relationship to the outcome variable. In the initial full model, a correlation matrix was examined for correlations of .30 or more. Non-significant variables were removed at this point unless they were confounders of significant variables (with a 10% change in the odds ratio as the cut-off point following Hosmer & Lemeshow, 1989) or had been identified for possible interaction in bivariate analyses. Interactions between demographic variables and all other variables were tested. Significant interactions were included in the model using forward stepwise regression based on the likelihood ratio test. Variables that were not significant by themselves or in interaction terms were then deleted. Model fit was assessed using Hosmer & Lemeshow's "Goodness of Fit" test.

FIGURE 2. Relationship between variables considered for multivariate model in thesis and general conceptual model based on previous research *



* Questions in boxes1-8 are generalized questions to consider when trying to understand a woman's likelihood of using an effective method, based on variables studied in previous research. The other questions represent the variables which were considered for multivariate modeling in this thesis. The arrows show the relationship between the variable questions and questions 1-8. For example, notice that one variable question is listed under question 6, and that no variables were available for questions 7 and 8.

Power Analysis

The power of this study was limited by the OHD study's sample size. The OHD sample of 606 had been designed to have a precision of +/- 4% margin of error for reporting any proportions for the total group using a 95% confidence interval. Precision of the thesis sample of 308 was reduced to a margin of error of +/- 6%, and it was understood that multivariate analysis confidence intervals would be even wider. However, the sample size was comparable to that in many studies from the literature.

Chi square power analyses (using version 6.0 of Power Analysis and Sample Size or PASS) were done for variables named in the three hypotheses. In order to have 80% power to detect a univariate difference with 95% confidence for a sample size of 308, an effect size of .16 or crude odds ratio of about 2 would be required. In the case of the intention status variable, the effect size was less than this, .14, with a power of .69. The effect size was .24 for financial access (power .98) and .18 for ambivalence (power .88).

Ad hoc chi square power analyses were also done for variables found to be related to the outcome variable in bivariate analysis but not statistically significant in the multivariate model. The results of these power analyses are described in the Multivariate Logistic Regression Model sub-section of the Results.

RESULTS

UNIVARIATE AND BIVARIATE RESULTS

Results are reported with re-coded categorical variables because Box-Tidwell transformations for the continuous independent variables showed the relationships to be non-linear. Univariate results for categorical variables are presented in Tables 4-8 beginning on page 43. The odds ratios for each independent variable and the outcome variable are also presented in the last two columns of Tables 4-8. Table 9 on page 48 shows relationships between independent variables, with correlations between independent variables of gamma .30 or greater at a significance level of .10 listed. Any interactions with the outcome variable that both were significant at .10 and included a demographic variable are indicated in Table 9 with a double asterisk (page 48) and are shown in Figure 3 (page 49).

Demographics

By design, the sample of 308 women included only low income Caucasians who had given birth within the last year. For most of the women, that birth had been their first (61%) or second (29%) child. Most were either married or otherwise cohabiting (84%). Two-thirds were younger than 25 years old, with a median age of 21. Almost two-thirds of the women had a high school degree or less. Detailed demographic data are presented in Table 4 (page 43). Table 9 on page 48 shows that many of these demographic characteristics were correlated. For example, being less than 25 years old was correlated with having one child (gamma .64), not cohabiting (.43), and having less than a college degree (.74).

All of the demographic variables shown in Table 4 were related to use of an effective contraceptive method at a significance level of .25 and all but one (number of children) were significant at .05. Women with one child, not cohabiting, younger and with less education were more likely to be using an effective method. However, the relationships of age and number of children to the outcome variable were not consistent across all groups, as shown in Figure 3 (page 49) and described below.

Figure 3a shows that women younger than 25 were more likely to use an effective method than older women among the subset of women who were ambivalent about becoming pregnant; but age had no impact for women who were unambivalent about their current desire to prevent pregnancy.

Figure 3b shows that among the group of women with one child, teens were more likely to use an effective method; however among women with two or more children, teens were ***less*** likely to use an effective method. However this interaction was not included in further analyses because it was based on very small cell size for teens with two children (n=6).

Women with one child were more likely to use an effective method than women with two or more children if they were teens (with the caveat mentioned above for Figure 3b), had a recent unintended birth (Figure 3c), or had more social support for using birth control (Figure 3d). However having ***two or more*** children was associated with use of an effective method among the subset of women with less social support for using birth control.

Financial Access

Financial access variables are summarized in Table 5 (page 44). By design, all of the women in the sample had received Medicaid coverage due to their recent pregnancy and all had incomes below 185% FPL at the time they were interviewed. Over half (53%) of the women in the study had incomes below 100% of the Federal Poverty Level (FPL) before their recent pregnancy and therefore were income-eligible for Medicaid coverage without regard to pregnancy status, but had not accessed it. (It is unknown how many of these women may not have been eligible for Medicaid based on factors ***other*** than income, for example assets tests or citizenship status. The number of women in the sample not eligible based on citizenship is likely to be low, since the largest group of undocumented women in Oregon, Hispanics, was excluded from the sample.) While half (52%) of this subset of women retained OHP coverage after their covered birth, a full 28% again had no insurance.

The other half (47%) of the women in the study were not eligible for basic Medicaid before their pregnancy based on their income. Thirty-eight percent of these women were still not income-eligible for basic Medicaid and did not have any other source of insurance. Forty-three percent had become eligible and had enrolled.

Most of the women (85%) were currently in the Women, Infant and Children's program (WIC), a nutrition program for women with incomes below 185% FPL. One-third of the women had used free or low cost public family planning clinic services in the past year. Insurance patterns for women who used vs. did not use public family planning clinic services were the same: one-third of the women now had no insurance, half had public insurance, and one-fifth had private insurance. Public health insurance covers the

cost of contraceptives. Of those who had private insurance, 39% had coverage for contraceptives.

Among financial access variables shown in Table 5, women who had used a public family planning clinic in the past year and women with public insurance were significantly more likely than other women to use an effective method.

Intention Status of Recent Birth and Contraceptive Behaviors

Table 6 on page 45 summarizes intention status and contraceptive behavior variables. More than half (55%) of the women's recent Medicaid births were unintended at the time of conception. Correlations in Table 9 (page 48) showed that women with a recent unintended birth were more likely to be younger (gamma .36), to not be cohabiting (.40) and to say that, if they were pregnant now, they completely agree it would interfere with other things in their life (.32). Women whose recent birth was unintended were also more likely to use an effective method now, especially among women with only one child, as shown in the interaction in Figure 3 (page 49). About two-thirds (63%) of women with unintended births had not been using an effective method before the pregnancy, but that decreased to one-quarter at the time of the interview.

By design, all women in the sample were currently fertile, not intending to become pregnant in the next six months, and using some type of reversible contraceptive method. Seventy percent of all of the women were currently using an effective contraceptive method (i.e. an IUD or one of the hormonal methods), with 41% of those evidently having received that method in a public family planning clinic. Birth control pills were the most commonly used effective method (41% of the total sample), followed

by hormonal injection (22%). The women using effective methods were more likely than those using less effective methods to say that the benefits of effective methods (e.g. not having to interrupt sex) were very important to them (74% vs. 66%). One-third of the women using the pill reported that they did not use it consistently, and 5% said they were likely to change to a less effective method in the next six months.

Thirty percent of the women were currently using a less effective contraceptive method. Most of these were using the condom (23% of the total sample). No data were available about the number of women using this less effective contraceptive method for the purpose of more effective disease protection. Among condom users, 27% reported inconsistent use and 39% said they were likely to change to a more effective contraceptive method in the next six months. Fifteen percent of the women using a less effective method had received it at a public family planning clinic, and after hearing about the free FPEP program services being offered in public clinics, an additional 39% of women using less effective contraceptive methods indicated interest in receiving services there.

Knowledge and Interest in Emergency Contraception

More than half (57%) of the women were aware of the availability of post-coital emergency contraception (EC). Less than half of the women said they were likely to use EC in the future if they needed it (26% very likely and 16% somewhat likely). Women who did ***not*** already know about EC were slightly more likely to indicate strong interest (34% very likely). Two other groups of women were identified as having a

greater interest in EC: women already using a hormonal method (32% very likely); and women who had used a public clinic during the past year (33% very likely).

Attitudes about Pregnancy and Planning

Table 7 provides detailed data about the women's attitudes about pregnancy and planning. All women in the sample were not intending to become pregnant in the next six months, but 74% agreed they would like to have another child at some point in the future (60% completely, 14% somewhat). Eighty-one percent agreed that it is better to plan when and how many children to have (56% completely, 25% somewhat). About two-thirds (65%) of the women agreed that it would be okay if they found out they were pregnant today (37% completely, 28% somewhat), 42 % disagreed that a pregnancy would interfere with other things they wanted to do (26% completely, 16% somewhat), and most of the women (81%) agreed that if you get pregnant, it is "meant to be" (60% completely, 21% somewhat).

Some variables measuring attitudes about pregnancy and planning were intercorrelated. Saying that a pregnancy now would interfere was correlated with saying that a pregnancy would not be okay. The ambivalence variable, as described in the Methods section (page 29), combined those two variables. It was found to have a stronger relationship with the outcome variable than either variable alone, and was less inter-correlated with other variables.

Table 7 shows that women with an attitude that it is better to plan how many children to have and when, and that a pregnancy now would interfere or would not be okay were more likely to use an effective contraceptive method. However, the

relationship of "ambivalence" to the outcome variable was ***not*** found among women less than 25 or among women with one child.

Perceived Social and Other Support for Contraception

The vast majority of the women in this study perceived themselves to have support for contraception in terms of the variables measured (Table 7). Ninety-two percent of the women agreed that "people important to you think birth control is a good idea" (79% completely, 13% somewhat). Most women strongly indicated that they were not too busy to use birth control (89% completely disagreed they were too busy), and that they would be able to talk with their provider if they had a problem with their birth control (90% completely agreed). Eighty-one percent of the women agreed that birth control "gives you a sense of control over your life" (50% completely, 31% somewhat).

Many of the variables measuring perceptions of support for contraception were correlated with each other and with attitudes about pregnancy. Having social support was correlated with and confounded the variable of not feeling too busy to use birth control (gamma .57) and having a "sense of control" (.48). Saying that a pregnancy now would interfere with other things in life was correlated with "sense of control" (.45).

Use of an effective method was more likely for women who said that people important to them think birth control is a good idea, although this relationship was ***not*** found among women with two children. Use of an effective method was more likely among women who perceived themselves as not being too busy to use birth control, and those who felt that birth control gives a sense of control over life.

Importance of Service Characteristics

Table 7 shows that only 29% of the women said public transportation to the clinic was "very important," and 38% saying on-site childcare was "very important." Table 8 on page 47 lists other service characteristics and their importance to the women. The distribution of all of these variables were highly skewed toward "very important," in descending order: clean clinic, 90%; service provider listens and responds, 90%; service provider keeps information private, 87%; service provider respects you, 87%; easy to make an appointment over the phone, 74%; waiting time is less than 15 minutes, 66%; reminder call for appointment, 55%; evening or Saturday appointment, 53%; on-site childcare 38%; and getting a follow-up call after the appointment, 33%.

MULTIVARIATE LOGISTIC REGRESSION MODEL

Table 10 (page 51) provides a summary of all of the crude odds ratios for variables with $p<.25$ for the likelihood ratio test and considered for modeling on theoretical grounds, and Table 11 (page 53) shows the final multivariate model.

Initially in the full model, age, number of children and education were all included. However age was highly correlated with number of children (gamma .30) and education (gamma .25). Age was found to be a significant confounder of the variable of number of children in the full model. While number of children was not significant in the model and was not a confounder, it was retained for possible interaction with several variables.

TABLE 4. Demographic variables:

Frequency distribution and association between characteristics and outcome variable*

Demographic variables	n (%) (Total = 308)	Percent Using an Effective Method	O.R. (95% C.I.)
Number of children			
One	187 (61%)	73%	→ 1.4 (0.8-2.4)
Two	88 (29%)	64%	
Three	22 (7%)	82%	
Four	6 (2%)	50%	1.0
Five	2 (1%)	0%	
Six	1 (0%)	50%	
Relationship status			
Married or Cohabiting	258 (84%)	65%	→ 1.0
Divorced	6 (2%)	83%	
Separated	6 (2%)	100%	8.5 (2.5-28.1)
Never Married	38 (12%)	95%	
Age			
15-17	14 (4%)	93%	4.4 (2.0-9.6)
18-19	49 (16%)	82%	
20-24	144 (47%)	74%	→ 2.3 (1.3-4.0)
25-29	65 (21%)	62%	
30-34	24 (8%)	25%	1.0
35+	12 (4%)	75%	
Education			
Less than H.S.	51 (17%)	75%	2.7 (1.1-6.3)
H.S.	142 (46%)	71%	
1-3 Years of College	92 (30%)	70%	1.0
College Degree	23 (7%)	48%	

* Crude odds ratios (O.R.) presented only for variables with $p<.25$.

TABLE 5. Financial access variables:

Frequency distribution and association between characteristics and outcome variable*

Financial access variables	n (%) **	Percent Using an Effective Method	O.R. (95% C.I.)
Income during recent pregnancy			
<100% federal poverty level	162 (53%)	72%	
>100% fpl	146 (47%)	67%	
Insurance status after birth			
Public insurance covers BC	148 (48%)	82%	→ 3.9 (2.2-6.9)
Private ins. covers BC	23 (7%)	65%	
Private ins. don't know if BC	12 (4%)	33%	} 1.6 (0.8-3.3)
Private ins. doesn't cover BC	24 (8%)	83%	
No insurance	101 (33%)	54%	→ 1.0
Insurance status after birth for <100% fpl during pregnancy (N = 162)			
Public insurance	85 (52%)	79%	→ 2.3 (1.1-5.2)
Private insurance	31 (19%)	68%	→ 1.3 (0.5-3.5)
No insurance	46 (28%)	61%	→ 1.0
Insurance status after birth for >100% fpl during pregnancy (N = 146)			
Public insurance	63 (43%)	86%	→ 6.6 (2.7-16.1)
Private insurance	28 (19%)	64%	→ 2.0 (0.7-5.1)
No insurance	55 (38%)	47%	→ 1.0
Public family planning clinic status			
Used in past year	101 (33%)	86%	→ 3.9 (2.0-7.3)
Likely to use in next 6 months	88 (29%)	59%	} 1.0
Not likely to use	119 (39%)	63%	
Insurance status & public clinic use			
Insurance and public clinic	65 (21%)	91%	→ 14.7 (5.5-39.1)
Public clinic only	36 (12%)	78%	→ 5.2 (2.0-13.2)
Insurance only	142 (46%)	71%	→ 3.6 (1.9-6.8)
Neither	65 (21%)	40%	→ 1.0
Financial access			
Public insurance	148 (48%)	82%	→ 6.7 (3.5-12.8)
No insurance, but public clinic	36 (12%)	78%	→ 5.2 (2.0-13.2)
Private insurance	59 (19%)	66%	→ 2.9 (1.4-6.0)
None	65 (21%)	40%	→ 1.0
Currently enrolled in WIC program?			
Yes	262 (85%)	70%	
No	46 (15%)	67%	

* Crude odds ratios (O.R.) presented only for variables with p<.25.

** Total sample = 308 unless otherwise stated.

TABLE 6a. Intention status & contraceptive variables:

Frequency distribution and association between characteristics and outcome variable*

Intention status & contraceptive behavior variables	n (%) **	Percent Using an Effective Method	O.R. (95% C.I.)
Intention status of previous pregnancy			
Unintended	170 (55%)	75%	→ 1.8 (1.1-3.0)
Intended	138 (45%)	62%	→ 1.0
Method use before unintended pregnancy (N=170)			
Birth control pills	48 (28%)	83%	1.9 (0.8-4.1)
Hormonal injection	15 (9%)	80%	
Diaphragm	1 (1%)	0%	1.0
Condoms	53 (31%)	74%	
Other	12 (7%)	41%	
None	41 (24%)	78%	
Previous method use and intention status of pregnancy			
Intended pregnancy (no info about previous method)	138 (45%)	62%	→ 1.0
Less effective method before unintended pregnancy	61 (20%)	69%	1.5 (0.8-2.5)
No method before	46 (15%)	74%	
Effective method before	63 (20%)	83%	→ 2.8 (1.3-5.9)
Knowledge of emergency contraception			
Yes without prompting	177 (57%)	71%	
Yes with prompting	69 (22%)	64%	
No	62 (20%)	73%	
Likelihood of using emergency contraception			
Very likely	79 (26%)	86%	→ 3.5 (1.7-7.0)
Somewhat likely	50 (16%)	68%	
Don't know	10 (3%)	40%	1.0
Somewhat unlikely	40 (13%)	70%	
Very unlikely	129 (42%)	62%	
Important that effective method gives you peace of mind			
Very important	188 (61%)	78%	→ 2.6 (1.6-4.3)
2	56 (18%)	55%	
3	30 (10%)	70%	
4	29 (9%)	48%	1.0
Not at all important	4 (1%)	25%	
Does not apply or other	1 (0%)	100%	
Important that with effective method don't have to interrupt sex			
Very important	128 (42%)	74%	→ 1.4 (0.8-2.4)
2	91 (30%)	67%	
3	38 (12%)	71%	
4	48 (16%)	58%	1.0
Not at all important	2 (1%)	100%	
Does not apply or other	1 (0%)	100%	

* Crude odds ratios (O.R.) presented only for variables with p<.25.

** Total sample = 308 unless otherwise stated.

TABLE 6b. Frequency distribution of outcome variable

with number & percent not always using or likely to change methods

Outcome variable: Current contraceptive method	n (%) (Total = 308)	Number & percent not always using	Number & percent likely to change
More effective methods			
Birth control pills	126 (41%)	44 (35%)	6 (5%)
Hormonal injection	68 (22%)	10 (15%)	0 (0%)
Hormonal implant	2 (1%)	0 (0%)	0 (0%)
IUD	18 (6%)	0 (0%)	1 (6%)
Less effective methods			
Diaphragm	4 (1%)	0 (0%)	0 (0%)
Condoms	71 (23%)	19 (27%)	28 (39%)
Other	19 (6%)	0% (0%)	12 (63%)

TABLE 7. Attitude & perception variables:

Frequency distribution and association between characteristics and outcome variable*

Attitude & perception variables	n (%) (Total = 308)	Percent Using an Effective Method	O.R. (95% C.I.)
Want children in future			
Completely agree	184 (60%)	71%	
Somewhat agree	44 (14%)	68%	
Don't Know	19 (6%)	84%	
Somewhat Disagree	24 (8%)	54%	
Completely Disagree	37 (12%)	68%	
Pregnancy would interfere			
Completely agree	93 (30%)	80%	→ 2.0 (1.1-3.7)
Somewhat agree	82 (27%)	68%	
Don't Know	4 (1%)	25%	1.0
Somewhat Disagree	48 (16%)	65%	
Completely Disagree	81 (26%)	64%	
OK if pregnant			
Completely agree	113 (37%)	63%	
Somewhat agree	86 (28%)	72%	
Don't Know	3 (1%)	67%	1.0
Somewhat Disagree	30 (10%)	63%	
Completely Disagree	76 (25%)	79%	→ 1.8 (1.0-3.5)
Better to plan			
Completely agree	171 (56%)	73%	→ 1.4 (0.9-2.3)
Somewhat agree	76 (25%)	64%	
Don't Know	2 (1%)	0%	1.0
Somewhat Disagree	40 (13%)	70%	
Completely Disagree	19 (6%)	63%	
If pregnant, meant to be			
Completely agree	185 (60%)	70%	
Somewhat agree	65 (21%)	72%	
Don't Know	2 (1%)	100%	
Somewhat Disagree	33 (11%)	64%	
Completely Disagree	23 (7%)	65%	
People important to you think BC is a good idea			
Completely agree	242 (79%)	74%	→ 2.3 (1.3-4.0)
Somewhat agree	41 (13%)	61%	
Don't Know	3 (1%)	33%	1.0
Somewhat Disagree	13 (4%)	62%	
Completely Disagree	9 (3%)	22%	
Birth control gives you a sense of control			
Completely agree	154 (50%)	81%	→ 2.9 (1.7-4.9)
Somewhat agree	97 (31%)	60%	
Don't Know	3 (1%)	67%	1.0
Somewhat Disagree	32 (10%)	66%	
Completely Disagree	22 (7%)	41%	
Too busy to use BC			
Completely agree	6 (2%)	33%	
Somewhat agree	7 (2%)	86%	
Don't Know	2 (1%)	0%	1.0
Somewhat Disagree	18 (6%)	56%	
Completely Disagree	275 (89%)	71%	→ 2.0 (0.9-4.3)
Could talk to a provider about a problem			
Completely agree	278 (90%)	70%	
Somewhat agree	16 (5%)	69%	
Don't Know	1 (0%)	0%	
Somewhat Disagree	5 (2%)	80%	
Completely Disagree	8 (3%)	50%	
Important to have public transportation to clinic			
Very important	90 (29%)	68%	
2	32 (10%)	66%	
3	43 (14%)	67%	
4	29 (9%)	69%	
Not at all important	69 (22%)	72%	
Does not apply or other	45 (15%)	73%	

* Crude odds ratios (O.R.) presented only for variables with p<.25.

TABLE 8. Service characteristic variables:

Frequency distribution and association between characteristics and outcome variable*

Service characteristic variables	n (%) (Total = 308)	Percent Using an Effective Method	O.R. (95% C.I.)
Childcare at clinic			
Very important	116 (38%)	75%	→ 1.5 (0.9-2.5)
2	53 (17%)	53%	
3	60 (19%)	63%	
4	17 (6%)	82%	1.0
Not at all important	50 (16%)	74%	
Does not apply or other	12 (4%)	83%	
Easy to make appt. over phone			
Very important	227 (74%)	70%	
2	51 (17%)	59%	
3	17 (6%)	82%	
4	7 (2%)	100%	
Not at all important	3 (1%)	100%	
Does not apply or other	3 (1%)	67%	
Evening or Sat. appointment			
Very important	162 (53%)	72%	
2	43 (14%)	72%	
3	53 (17%)	60%	
4	21 (7%)	71%	
Not at all important	25 (8%)	60%	
Does not apply or other	4 (1%)	100%	
Reminder call for appointment			
Very important	168 (55%)	73%	→ 1.3 (0.8-2.2)
2	58 (19%)	71%	
3	52 (17%)	63%	
4	16 (5%)	50%	1.0
Not at all important	10 (3%)	80%	
Does not apply or other	4 (1%)	50%	
Follow-up call			
Very important	101 (33%)	73%	
2	73 (24%)	66%	
3	75 (24%)	64%	
4	25 (8%)	84%	
Not at all important	27 (9%)	70%	
Does not apply or other	7 (2%)	57%	
Clean clinic			
Very important	278 (90%)	68%	→ 0.4 (0.1-1.1)
2	19 (6%)	79%	
3	3 (1%)	100%	
4	1 (0%)	100%	1.0
Not at all important	5 (2%)	100%	
Does not apply or other	2 (1%)	50%	
Waiting time less than 15 minutes			
Very important	202 (66%)	70%	
2	56 (18%)	63%	
3	28 (9%)	79%	
4	7 (2%)	86%	
Not at all important	13 (4%)	69%	
Does not apply or other	2 (1%)	50%	
Service provider keeps info private			
Very important	267 (87%)	69%	
2	20 (6%)	75%	
3	12 (4%)	75%	
4	2 (1%)	50%	
Not at all important	5 (2%)	80%	
Does not apply or other	2 (1%)	50%	
Service provider listens & responds			
Very important	276 (90%)	69%	
2	21 (7%)	76%	
3	3 (1%)	33%	
4	1 (0%)	100%	
Not at all important	5 (2%)	100%	
Does not apply or other	2 (1%)	50%	
Service provider respects you			
Very important	269 (87%)	68%	
2	18 (6%)	72%	
3	9 (3%)	78%	
4	5 (2%)	80%	
Not at all important	4 (1%)	100%	
Does not apply or other	3 (1%)	67%	

* Crude odds ratios (O.R.) presented only for variables with p<.25.

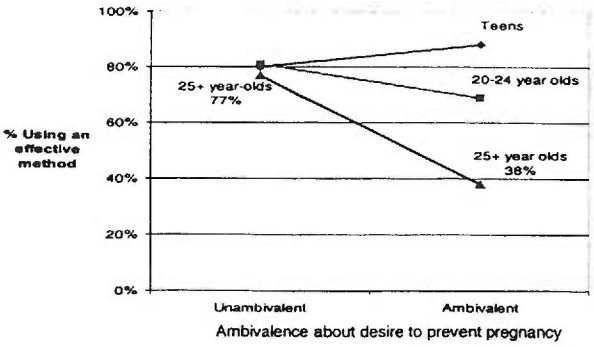
TABLE 9. Bivariate correlations between all independent variables to be considered for multivariate model on theoretical grounds, with bivariate interactions for all demographic variables with outcome variable noted *

Category of Variable	Variable	One child	Not cohabiting	Less than 25 years old	Less than college degree	Have insurance	Previous pregnancy unintended	Better to plan when and how many children to have	If pregnant now, not OK	If pregnant now, it would interfere	Want child in future	Not too busy	BC gives sense of control	Have social support to use BC
Demographics	One child		0.65	0.64 **	**	-	0.52 **	-	-	-	0.77	-	-	**
	Not cohabiting	0.65		0.43	1.00	0.55	0.40	-	-	-	-	-	-	-
	Less than 25 years old	0.64 **	0.43		0.74	-	0.36	-	-	-	0.46	-	-	-
	Less than college degree	**	1.00	0.74		-	-	-	-	-	-	-	**	-
	Have insurance	-	0.55	-	-		-	-	-	-	-	-	-	-
Attitudes toward pregnancies	Recent pregnancy unintended	0.52 **	0.40	0.36	-	-		-	-	0.32	-	-	-	-
	Better to plan when and how many children to have	-	-	-	-	-	-		-	0.46	-	-	0.39	-
	If pregnant now, not OK	-	-	-	-	-	-	-		0.26	-	-	-	-
	If pregnant now, it would interfere	-	-	-	-	-	0.32	0.46	0.26		-	-	0.45	-
	Want child in future	0.77	-	0.46	-	-	-		-	-		-	-	-
Perceived ability	Not too busy	-	-	-					-	-	-		0.30	0.57
to effectively contracept	BC gives sense of control	-	-	-	**	-	-	0.39	-	0.45	-	0.30		0.48
	Have social support to use BC	**	-	-	-	-	-		-	-	-	0.57	0.48	
Combined variable	Attitude toward pregnancy: Unambivalent	-	-	**	-	-	-	0.25			-	-	0.25	-

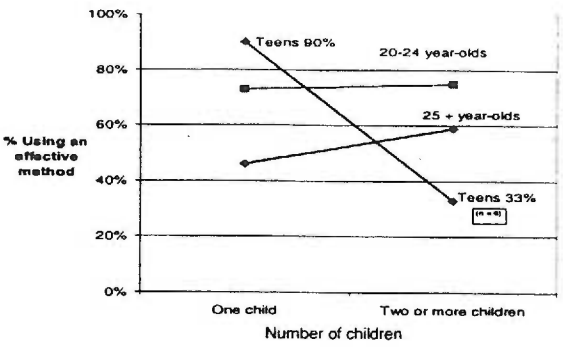
* Gamma is indicated for a pair of independent variables when the correlation was significant at p<.10. Pairs of independent variables including a demographic variable that interact with the outcome variable in a Breslow-Day test at p<.10 are marked with a double asterisk (**).

FIGURE 3. Use of an effective method:
Interactions with Number of children or Age *

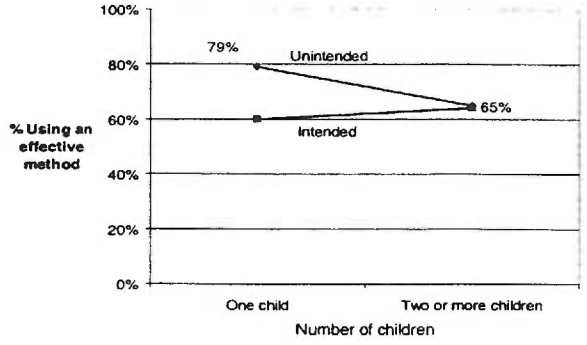
a. Use of an effective method:
Age by Ambivalence about
desire to prevent pregnancy



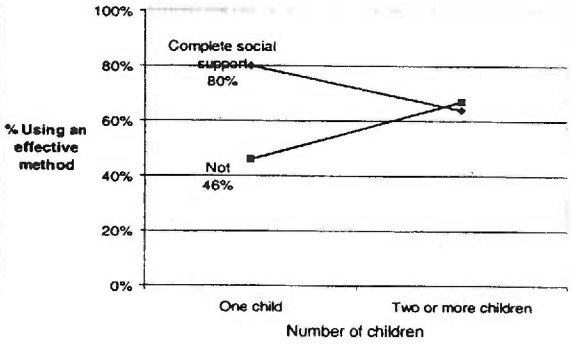
b. Use of an effective method:
Age by Number of children



c. Use of an effective method:
Intention status of recent birth
by Number of children



d. Use of an effective method:
Level of social support for using birth control
by Number of children



* All interactions shown were significant using the Breslow-Day test of homogeneity, with p<.10

Both age and relationship status confounded education, making education not significant in the full model. Education was not a confounder in the multivariate model nor did it significantly contribute to that model. While bivariate analysis had shown an interaction between education and number of children, the cell sizes were too small to be stable. Chi square power analysis showed that for the .13 effect size of the education variable, power was .64 for a significance level of .05. The variable of education was removed from the model.

The variable intention status was not significant and did not contribute significantly to the model, but bivariate analysis had shown interaction with number of children. The intention status variable remained in the main effects model, but when it was found later not to be significant in any interaction, it was removed. Chi square power analysis showed that for the .14 effect size of the intention status variable, power was .69 for significance level of .05.

Two variables, "better to plan" and "not too busy," were not significant in the full model, were not confounders, and were not candidates for interaction based on results of earlier bivariate analyses. They were removed from the model. Power was limited to detect these associations, with chi square power of .33 for the .08 effect size of the "better to plan" variable, and power of .50 for the .11 effect size of the "not too busy" variable.

Single interactions that fit into the model were number of children by social support, number of children by ambivalence, and age by ambivalence. The number of children by ambivalence interaction had not been significant in bivariate analysis, and it

TABLE 10. Crude odds ratios for variables with p<.25 & considered for multivariate logistic regression on theoretical grounds

Variable Type	Q #	Variable	Abbreviation	Category	B *	S.E. (B)	Crude Odds Ratio	95% Confidence Interval		-2 LogLikeli-hood	G **	p for Likelihood Ratio Test
CONSTANT					0.82	0.12				378.96		
DEMOGRAPHICS	F2	Number of Children	ONECHILD	One child	0.39	0.25	1.47	0.90	2.40	376.61	2.35	0.13
	F4	Relationship Status	NOTCOHAB	Not Cohabitting	2.14	0.61	8.53	2.58	28.17	357.64	21.32	<.01
	F1	Age	LESS_25	Less than 25 years old	1.02	0.26	2.77	1.67	4.60	363.41	15.55	<.01
	F5	Education	LESS_COL	Less than College Degree	0.99	0.44	2.70	1.15	6.37	373.90	5.06	0.02
	F6 & F6i	Insurance Coverage	INS_YN	Yes	1.09	0.26	2.96	1.78	4.93	361.31	17.65	<.01
ATTITUDES TOWARD PREGNANCIES	E1b, E5, E2	Previous method use and intention status of pregnancy	UNINTEND	Unintended	0.61	0.25	1.84	1.13	3.01	372.93	6.03	0.01
	C2 & C4	A pregnancy would be OK and/or interfere	AMPG_3_2	Very negative about pregnancy	0.83	0.27	2.30	1.37	3.88	368.60	10.36	<.01
	C6	Better to plan children	C6_PLAN	Completely Agree	0.38	0.25	1.47	0.90	2.39	376.60	2.36	0.12
PERCEIVED ABILITY TO EFFECTIVELY CONTRACEPT	C9	Not too busy to use birth control	C9NOTBSY	Completely Disagree Too Busy	0.73	0.37	2.07	0.99	4.30	375.31	3.65	0.06
	C10	BC gives you a sense of control	C10CNTRL	Completely Agree	1.08	0.26	2.94	1.76	4.90	360.96	18.00	<.01
	C12	People important to you think BC is a good idea	C12SOC	Completely Agree	0.84	0.29	2.32	1.32	4.07	370.54	8.42	<.01

* B is the logistic regression coefficient for each variable. The crude odds ratio for each variable equals e raised to the power of B.

** G is the -2 log likelihood from the model with the variable, minus the -2 log likelihood from the model with the constant only.

became non-significant in the multivariate model when the other interaction involving "ambivalence" was included. Thus the interactions left in the final model were: (1) number of children by social support; and (2) age by ambivalence. This combination of interactions was confirmed by a forward stepwise variable selection procedure.

The final model (Table 11 on the next page) included main effects of not cohabiting, having insurance, and having a sense that birth control gives you a sense of control over your life, and interactions showing that ambivalence had an impact for older women but not younger women, and that having social support had an impact on women with one child but not women with two or more children. The total Nagelkerke adjusted R^2 of the model was .34, and the model was significant at .01. The Hoesmer and Lemeshow Goodness of Fit test was not rejected, implying no overt lack of fit in the model.

TABLE 11. Final multivariate logistic regression model

	Adjusted Odds Ratio	95% Confidence Interval	p for Wald Statistic
MAIN EFFECTS			
Not cohabiting vs. Cohabitting	**5.1**	1.5 - 17.6	0.01
Having insurance vs. Not	**3.1**	1.7 - 5.7	<.01
Completely agree that birth control gives you a sense of control over your	**2.7**	1.5 - 5.0	<.01
INTERACTIONS FOR ATTITUDES & PERCEPTIONS			
Unambivalent about pregnancy vs. Ambivalent			
Women 25 and older	**4.5**	1.7 - 12.0	<.01
Women younger than 25	0.7	0.3 - 2.0	0.61
Having more social support for using birth control vs. Not			
Women with one child	**4.9**	2.0 - 12.0	<.01
Women with two or more children	1.3	0.4 - 3.4	0.66
SAME INTERACTIONS, BUT EXPRESSED IN TERMS OF DEMOGRAPHIC VARIABLES			
Being younger vs. Older			
Women ambivalent about pregnancy	**5.8**	2.6 - 12.6	<.01
Women unambivalent about pregnancy	0.9	0.3 - 2.5	0.86
Having two or more children vs. One child			
Women with less social support	**3.9**	1.2 - 12.6	0.02
Women with more social support	0.8	0.3 - 2.2	0.66

DISCUSSION

The research objectives for this thesis were to test three hypothesized associations with use of an effective method, to identify any other characteristics associated with use of an effective method, and to describe a group of women on Medicaid due to a recent birth. The status of these objectives is discussed in the context of the literature review. Then limitations of the study are assessed.

HYPOTHESES

Hypothesis regarding Intention Status of Recent Birth

Hypothesis 1 of this study stated that "Use of an effective contraceptive method is more likely among women whose recent birth was unintended." This hypothesis was supported in univariate analysis (crude OR 1.8, 95% CI 1.1-3.0). In bivariate interaction, the relationship was stronger among women with one child, with a crude OR of 2.4 (95% CI 1.2-4.8). This variable was not significant in the multivariate model, for several possible reasons. First, it is possible that women under-reported unintended pregnancy due to perceived social undesirability. If those women were using an effective method now, their mis-classification would weaken the apparent association. Second, while having an unintended birth could be a motivator to use an effective method, it could also be an indication of ***not*** having used an effective method in the past. If both types of women participated in the study, then the apparent association would be weakened. Third, power was not sufficient to detect a difference (power was .69), and finally, multi-colinearity dampened the relationship. In ad hoc modeling which forced the intention status variable into the model (along with the other two variables in

hypotheses – health insurance status and ambivalence) and which included only other variables that allowed it to remain in the model (education and social support), using an effective method was 1.7 times more likely for women whose recent birth was unintended than for women with an intended birth (95% CI 1.04-2.98).

A stronger association with use of an effective method might be found with a more extreme measure of unintended birth (unwanted birth), a more socially negative unintended event (abortion, as studied by Bulut, 1984), or a more recent event such as immediately after a negative pregnancy test rather than nine months after a positive pregnancy test (as suggested by Sola, 2000).

Another way to explore a possible association between having an unintended birth and using an effective method is to look at method use before vs. after the event (as Bulut did with abortion). While information on before-and-after method use for women with an intended birth was not available for all subjects in this study, it is notable that among women with an unintended birth, the percent using an effective method increased from one-third before the birth to three-quarters after. This suggests that having an unintended birth may provide at least temporary motivation to use a more effective contraceptive method.

Hypothesis regarding Financial Access

Hypothesis 2 for this study stated that "Use of an effective contraceptive method is more likely among women who have financial access to contraceptive services." This hypothesis was supported in a multivariate model showing that women with health insurance were 3.1 times more likely to use an effective contraceptive method than

women without health insurance (95% CI 1.7-5.6). This finding is consistent with the reviewed literature.

Hypothesis regarding Ambivalence about Current Desire to Prevent Pregnancy

Hypothesis 3, "The association between financial access and use of an effective contraceptive method is greater than the association for a variable designed to measure ambivalence about pregnancy," was neither supported nor excluded. Forrest & Frost (1996) and Sable et al. (2000) had found that attitudinal measures of ambivalence toward pregnancy were negatively associated with use of contraception or with consistent use, and Chetkovich et al. (1999) suggested that ambivalence and skepticism about pregnancy and planning might be more important than cost as barriers to use of contraception. This study did find a sizable association between ambivalence and use of an effective method. The relationship depended on the number of children or the age of the woman. Among older women, those who were unambivalent about their current desire to prevent pregnancy were 4.5 times more likely to use an effective method as those who were ambivalent (95% CI 1.7-12.0). The point estimate of that relationship was larger than the relationship with health insurance for all women (adjusted OR of 3.1). However since the confidence intervals overlapped, the hypothesis could neither be supported nor excluded based on these results. Testing of the hypothesis was complicated by the inclusion of the interaction of ambivalence with age. The intent behind the hypothesis was to judge the relative importance of financial access and ambivalence for the purpose of prioritizing interventions for the ***overall*** population, not just one age group. When a similar multivariate model was run ***without*** the interaction with age, the relative size of

the point estimates reversed direction: among all women, the adjusted OR decreased to 1.5 (95% CI 0.8-2.7). However due to wide confidence intervals, the hypothesis was again neither supported nor excluded.

OTHER CHARACTERISTICS ASSOCIATED WITH USE OF EFFECTIVE METHOD

Demographics

Age. In multivariate analysis, among the subset of women who were ambivalent about pregnancy, younger women were more likely than older women to use an effective method (adjusted OR 5.8, 95% CI 2.6-12.5). The findings are consistent with studies of low income women by Condelli (1986) and Forrest & Frost (1996) showing that younger women use more effective methods.

Chetkovich et al. had suggested that ambivalence about pregnancy might be an important barrier to contraceptive use, particularly for teens. This study did not find ambivalence to be a factor for younger women specifically for use of an effective method. In fact among the subset of women who were ambivalent about pregnancy, younger women were more likely than older women to use an effective method (adjusted OR 5.7, 95% CI 2.6-12.5), suggesting that regardless of a young woman's ***stated*** ambivalence, she does not want to have another child anytime soon and therefore uses an effective contraceptive method.

Bivariate analysis showed that in one case, teens were less likely to use an effective method – when they already had two or more children. However this finding was based on only six teens with two or more children, so no conclusion can be reached. This issue was not addressed in the literature review. One possible interpretation

consistent with the data is that the religious beliefs or cultural values of these teens favor early (and frequent) parenthood. Another possible interpretation is that high risk behavior in the past, which has resulted in having more children, simply continues into the future.

Number of Children. When age and other variables were controlled, no main effect for use of an effective method based on number of children was found. This seems consistent with Tanfer et al. (1992) who found that while high "relative fertility" (current vs. desired total fertility) was associated with ***use*** of contraception, it was ***not*** associated with the outcome of use of an ***effective method***.

This study did not find the same results as Tanfer et al. (2000) and a study of low income women by Forrest & Frost (1996) in regards to a specific interaction between number of children and wanting a child in the future. But for women with less than complete social support for using birth control, women having two or more children were more likely to use an effective method than women with only one child (adjusted OR 3.8, 95% CI 1.2-12.5). This finding seems consistent with the idea that once a woman has two children, she is more certain that she wants to prevent a pregnancy – so lack of social support for using birth control no longer has a strong impact on her decision to use an effective method.

Relationship Status. When other variables were controlled for, not cohabiting was associated with use of an effective (adjusted OR 5.0, 95% CI 1.4-17.6). This finding is consistent with two studies in the literature that found single women (Spinelli et al. 2000) or formerly married women (Tanfer et al. 2000) were more likely to use effective methods. It is also consistent with suggestions from qualitative research by Sola (2000)

that women may become less vigilant about contraception when their life situation more closely matches the social ideal for having children.

Education. In bivariate analysis, having less than a college education was associated with use of an effective method, which is consistent with the findings of studies of use of long-acting methods (Tanfer et al 2000 and Gazmararian 1999). These findings suggest that level of education is a marker for how equipped women feel to handle the complexities of learning how to use coitus-dependent methods, or perhaps that contraceptive service providers have that belief. However, this study's multivariate analysis did ***not*** show the relationship among women with two or more children, and was ***not*** significant in multivariate analysis. The relationship may be weaker in this study because the outcome variable was use of an effective method, including a method that requires more planning and vigilance: birth control pills.

Perceived Social and Other Support for Contraception

Social support was identified in the literature as being associated with use of contraception (Forrest & Frost 1996) and consistent use (Sable et al. 2000). In this study, a relationship with the outcome variable of use of an effective method was found for complete agreement that "people important to you think birth control is a good idea," but only for the subset of women with one child (adjusted OR 4.8, 95% CI 1.9-12).

Among low income women, being "too busy" was identified in qualitative research as a barrier to contraceptive use (Chetkovich et al. 1999), and was found to be associated with inconsistent use (Sable et al. 2000). This study found it to be associated

with the outcome of use of an effective method in bivariate but not multivariate analysis. However the power to detect an association in chi square was only .50.

The specific variable "birth control gives you a sense of control over your life" was not in the literature reviewed and is ambiguous in its meaning. Having a "sense of control" could be interpreted as a sense of personal ability that is reflected in effective contraception, or confidence in the efficacy of contraceptive methods. Studies including self-efficacy variables were not reviewed. Lack of confidence in the efficacy of contraceptives may be related to Chetkovich et al.'s (1999) concept of "skepticism about the effectiveness of birth control," and Condelli's (1986) finding that women with doubts about effectiveness are less likely to use an effective method. In this study, "birth control gives you a sense of control" was significant (adjusted OR 2.7, 95% CI 1.4-4.9).

Service Characteristics

Forrest & Frost (1996) found that women receiving services at a public clinic were more likely to use an effective method than those with a private provider. The results of this study are not directly comparable because data were not available about women's use of private providers. But bivariate analysis in the study did find that women who had used a public clinic in the past year were 3.9 times more likely to be using an effective method than women who had not. This relationship is consistent with the finding about another measure of financial access already discussed, health insurance. The relationship could also be related to some other characteristics of public clinics, such as contraceptive counseling approaches and method availability. Future research could clarify these issues.

DESCRIPTION OF WOMEN ON MEDICAID DUE TO A RECENT BIRTH

In addition to providing context for the study results, descriptive analysis (1) allows assessment of the relative size of opportunities for intervention; and (2) provides partial assessment of representativeness of the study sample and therefore generalizability of the study results.

Relative Size of Intervention Opportunity

The size of an intervention opportunity depends in part on how many people can potentially be impacted. For example, an intervention targeted toward women with an unintended birth (55% of the study population) could have a larger impact than an intervention targeted toward women not cohabiting (16% of the study population).

Another example involves ambivalence about pregnancy, an attitude that was found to be prevalent in this population (58%). However the association between ambivalence and use of an effective method was found only for the 33% of women in the sample who were 25 years old or older, so that lessens the potential impact.

A final example shows the possible impact of addressing limited financial access. None of the women had health insurance before pregnancy, and while half of them had Medicaid coverage after the birth, about one-third of the women again had no insurance. If the association between health insurance and use of an effective method is causal, increasing health insurance could impact a large number of women.

Comparison to Similar Populations

Descriptive analysis of intention status and contraceptive variables in the study vs. other similar populations provides partial assessment of the representativeness of the study sample and therefore the generalizability of the study results. For example, the proportion of unintended births is higher for Medicaid women in this study (55%) compared to that for all births (40%) in the 1998-1999 Oregon PRAMS survey, and is comparable to the percent found for Medicaid births (57%) in that same survey.

The sample also appears to be representative in terms of use of an effective method. The seventy percent of women in the study using an effective method is higher than Oregon's 1998 rate of 61% using an effective method in the general (not income-specific) population of women using reversible methods, but not significantly higher than the 65% among reversible method users in Oregon's Medicaid population (BRFSS) or the rate among women with a recent Medicaid birth, 66% (PRAMS 1998/1999).

One more comparison adds further support for the representativeness of the sample: More than half (53%) of the women were aware of the availability of emergency contraception (EC), compared to 55% among Medicaid women in PRAMS.

LIMITATIONS

Study Design. The best design for studying contraceptive method choice might be a longitudinal prospective cohort study where women not yet using a method are interviewed before and after they make their choices. In the case of an observational cross-sectional study such as this one, statistical power is reduced, and inferences about

causality are seriously limited. Because the time sequence of events cannot be known, significant factors should only be discussed in terms of association, not determination.

Concerns about causal direction should be noted for the following variables. Having insurance might enable use of an effective method, or a desire to use an effective method might motivate a woman to apply for Medicaid. It is possible that a woman goes to a public clinic, receives information about effective methods, is advised to use one, is told it is free, so she decides to use one, or a woman may decide to use an effective method and then go into a public clinic to obtain the method. Using an effective method could provide a sense of control, or having that sense of control could lead a woman to use an effective method. Using an effective method could result in having fewer children, or having more children could result in a decision to use an effective method. Similarly, having a recent unintended birth could be a motivator to use an effective method, or it could be an indication of not having used an effective method in the past.

Subjects for OHD study. The actual sample of the OHD study on which this study is based may not have been representative of the intended sample: a census of women whose Medicaid coverage began with a recent birth. Only women who had a phone (and the same phone number as when they enrolled for Medicaid), who were reached at home within one week, and who spoke either English or Spanish could be included. The response rate for the women who were reached was fairly high at 68%, the direct refusal rate low at 6%, and the deletion rate for missing data fairly low at 4%. The intended and actual samples for the OHD study were similar in income distribution (greater than or less than 100% FPL at time of Medicaid enrollment) – a variable which might be expected to vary for women with and without phone service. The age

distribution was similar to that of Medicaid births as recorded on birth certificates: 61% less than 25 years of age vs. 57% in the OHD sample. However, the distribution by race/ethnicity was different from a similar population in Oregon 1998/1999 PRAMS: 35% women of color vs. 17% in the OHD sample.

Subjects for Thesis. The sample for this study was representative as measured by its comparability to other similar populations in proportion of unintended birth and use of effective contraceptive methods (as described above). But it is not representative for the general issue of pregnancy prevention among low income women in terms of race and parity. All of the women in the study were Caucasian, while 35% of a similar subgroup of women in Oregon PRAMS were women of color. Similarly with respect to parity, all of the women in the study already had at least one child, while more than half of the women seeking public family planning clinic services (at least in Oregon) have no children.

On the other hand, the study's more specific focus may be considered a strength: rather than sample the broader population in need of pregnancy prevention, the study focused on women with recent births – all of them with costs to society through Medicaid, and many for whom the pregnancy was unintended.

Statistical issues. The sample size of 308 may not be enough to detect existing associations, e.g. for the variables of education, intention status of recent birth, "better to plan" and "meant to be." Power may also have been insufficient to detect a difference in magnitude of associations for ambivalence and health insurance coverage. As noted above, a cross-sectional study such as this one is more limited in power than a longitudinal prospective cohort study would be.

Measurement Instrument and Independent Variables. The accuracy and reliability of self-report in the format of a telephone survey may be questioned based on social desirability factors, particularly regarding questions about pregnancy intention.

Measurements may have been too crude to identify subtle variations in attitudes. It was observed that the women were most likely to answer in the extreme category of the attitudinal variables measuring level of agreement, importance or likelihood. Some of the attitudinal variables might have been better measured with multiple questions statistically grouped into factors. In particular, the ad hoc construction of the ambivalence variable should be considered. What is it really measuring, and can it be measured reliably from day to day?

Future research should include variables which were part of the conceptual model for this study but not measured: knowledge of contraceptive methods and services, perceived negative attributes of contraceptive methods, and the competing needs of pregnancy prevention and protection from sexually transmitted disease.

Outcome Variable. This study's outcome variable was use of an effective reversible method. The results and conclusions can apply to only that one dimension of effective contraception,

Future research might consider other dimensions of effective contraception, including sterilization, use/non-use of reversible methods, and consistency of use. An immediate opportunity exists to study the latter outcome variable, using the OHD survey results (although with smaller sample size, therefore less power). Comparison of such a study's results to this study's could identify characteristics associated with use of an effective method vs. consistency of use within one particular population.

CONCLUSIONS

Implications for public health policy may be generalized from the results of this study to the broader population of low income women and their use of an effective reversible contraceptive method. These implications should be considered in light of the limitations discussed above – especially the facts that (1) the subjects differ in race/ethnicity and parity from the general population, and (2) use of an effective method is just one dimension of effective contraception. Further public health research can also be recommended.

Identifying Demographic Risk Groups. The results identify three risk groups for ***not*** using an effective contraceptive method: women 25 or older who are ambivalent about pregnancy, women with one child and no social support, and cohabiting women. While the results of this study are consistent with intuitive identification of teens with two or more children as a risk group, no conclusion can be drawn due to insufficient sample size. Future research including more teens, women with no children and women of all races may identify other risk groups.

The groups of women who ***are*** using an effective method, for example women not cohabiting, may or may not also be using a condom to prevent sexually transmitted disease (STD). Since this study included only data about the primary method used specifically for pregnancy prevention, the results cannot identify risk groups for not using an effective STD prevention method. Further research is needed.

Intervening after an "Unintended Event." Among women whose recent birth was unintended, the percent using an effective method increased from one-third before the pregnancy to three-quarters after, suggesting that an unintended pregnancy may be an

important opportunity for intervention. Additional research is required to confirm the association with a recent unintended birth and to explore opportunities for interventions among women with other "unintended events," that is abortions and negative pregnancy tests. For example, this issue could be studied among women visiting Oregon's FPEP clinics, using information available in the billing claims database.

Counseling and Education. The results of this study suggest that ambivalence about pregnancy may be an important issue for contraceptive service providers to consider when assessing and counseling women. Women could be encouraged to think about how having a child would impact their lives and to keep that in mind while deciding which contraceptive method to use. However, lack of time may be a challenge to providing this counseling.

Other topics for assessment and counseling are social support and sense of control. Notably, only half of the women completely agreed that "birth control gives you a sense of control over your life." However, future research needs to clarify the meaning of this variable. "Birth control" could be interpreted as referring to contraceptive methods in general or to the specific method being used. Having a "sense of control" could be interpreted as a sense of personal ability that is reflected in effective contraception, or confidence in the efficacy of contraceptive methods.

This study suggests that women could benefit from more education about emergency contraception, and that the clients of public clinics are interested in using it. This is particularly notable given public health advocates' assertions that if emergency contraception were used to its maximum potential, the number of unintended pregnancies could be reduced by half (e.g. Trussell in Kolata, 2000). For immediate further research,

the OHD survey results could be analyzed using interest in emergency contraception as the outcome variable.

While additional research would be needed to confirm whether women who use an effective contraceptive method are less likely to also use a condom when needed, another counseling topic should be the weighing of risks and encouraging dual method use where appropriate.

Social Marketing of Public Contraceptive Services. It is notable that after hearing about free services available through Oregon's Medicaid waiver, 39% of the women using a less effective method indicated interest in receiving services at a public family planning clinic. The information from this study about risk groups, attitudes, interest in emergency contraception and interest in free services could be used to plan and market services to women. This is certainly the intent of Oregon's Medicaid waiver social marketing campaign.

Improving Financial Access. The fact that almost half of the women in the study were income-eligible for Medicaid before the conception of their recent birth but were not enrolled, points to some possible access problems within the basic Medicaid program, at least in Oregon. Outreach and enrollment assistance for these women may be needed. Policies such as presumptive eligibility for basic Medicaid and/or on-site self-declared eligibility for a Medicaid family planning waiver such as FPEP might help. Future research might examine this group of women more closely, including (1) their ***reasons*** for not accessing Medicaid; and (2) a comparison of their rate of unintended pregnancy to the rate for women who ***have*** accessed Medicaid.

The fact that health insurance was found to be associated with use of an effective method suggests that financial access such as that provided through a Medicaid waiver might have an impact. One-third of the women in this study had no health insurance. Among women using less effective methods, 39% were interested in using free services through FPEP. At least until the U.S. has universal health coverage and/or insurance mandates for birth control/prescriptive equity, free or low cost services need to be available.

Contraceptive Choice. Any conclusions drawn from this study should be considered within a broader ethical and practical context. Public policies that require effective contraception through use of more effective methods would certainly be unethical. Moskowitz et al. (1996) point out that the counseling model used in public family planning clinics is very non-directive, and suggest that some modification of the current counseling model might be appropriate. But Chetkovich et al. (1999) point out that women do not appreciate pressure from their providers to use a specific method and may as a result not use the method well. Considering the state of contraceptive technology, one type of contraceptive method – or even a few effective methods – certainly cannot fit all women. Considering the need for protection against sexually transmitted disease, a typically less effective method for pregnancy prevention, the condom, may be the best choice for some women.

Public health cannot make women's choices, but rather should provide education about the negative impact of unintended pregnancy and disease, describe possible choices for prevention, and advocate for reduction of any financial and other barriers to make those choices real. The results of this study suggest that financial barriers currently do

prevent some women from using more effective pregnancy prevention methods, and that in order to make real choices available to more women, financial barriers need to be removed.

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APPENDIX A

Detailed Literature Review of
Analytic Studies of Contraceptive Behaviors

A number of variables (within the broad categories of demographics, perceived susceptibility to pregnancy, knowledge, attitudes about pregnancy and planning, perceived ability to effectively contracept, financial access, and contraceptive method and service characteristics) have been previously studied in relation to patterns of contraceptive behavior. This literature review focuses primarily on recent U.S. and selected European studies that (1) examine use of effective reversible contraceptive methods; (2) use a low income population for the sample and/or include income-related variables in the analysis; and (3) include variables which may be considered amenable to relatively short-term change (e.g. financial access and service characteristics).

A recent study of contraception in Europe provides context regarding the association between demographic factors and effective contraception. Spinelli et al. (2000) used multivariate logistic regression to analyze data from a population based cross-sectional study of 6,630 women aged 25-44 in five European countries (Denmark, German, Italy, Poland and Spain). Single women were found to be more likely than married women to use contraception and to use more effective methods (IUD, hormonal, or sterilization). Use of contraception and more effective methods also increased with increasing number of children. No effect was found for age, but women younger than 25 were not included in the study. Income was not included as a variable in the analysis, but education (which can be a marker for income) was found to be associated with effective contraception: women with nine years of schooling or more were more likely to use contraception. Use of effective contraceptives was found more frequently in Northern and Western Europe than in Southern and Eastern Europe. The authors point out that the more developed Northern and Western countries have had a stable contraceptive pattern over the past ten years, and suggest that effective contraception in Southern and Eastern Europe could be increased through improvements in education and provision of contraceptives.

Delbanco et al. provide further context for understanding U.S. contraception in their 1997 survey of barriers to contraception in three countries: the U.S., Canada and the Netherlands. They found that the American public was more likely to perceive unplanned pregnancy as a "very big problem," to think that the problem is of a moral nature, to be skeptical about contraceptive method safety and effectiveness, and to perceive cost and access to be significant barriers to contraceptive use. In a separate report of the same study, Mauldon & Delbanco (1997) note that low income American respondents were even more likely than their higher income counterparts to cite cost and access as barriers to contraceptive use.

A study by Grady et al. (1993) combined U.S. National Survey of Family Growth (NSFG) data with aggregate community data and found evidence that morality issues, cost, and access are associated with use of effective contraceptive methods. High socioeconomic status and ready access to family planning information and services were associated with a higher three-and-a-half year average effectiveness level of contraceptive

methods used in a community, while the relationship was reversed for a variable of "high community liberality".

Sable et al. (2000) studied women's perceptions of barriers to effective contraception with a survey of 311 low income women aged 18-39 who were very likely to have an unintended pregnancy: these women were seeking a pregnancy test at a public family planning clinic and said they hoped the result would be negative. The majority of women disagreed that the items in the survey were barriers. However, multivariate analysis of variance showed higher average agreement with barriers for women who said they sometimes/rarely/never used contraceptives vs. those who always/quite often used a method. Significant barriers included lack of knowledge of how to get contraceptives, lack of family support, worry about side effects, too busy, transportation problems, cost, and an attitude that "when it is my time [to get pregnant], it will happen".

Another item in the Sable et al. survey found to be associated with less consistent contraceptive use was the statement "I didn't think I would get pregnant." Other authors have studied other so-called "perceived susceptibility to pregnancy" variables, with varying results. Those finding a relationship between lack of perceived susceptibility to pregnancy and less effective contraception include Rainey et al. (1993) and Radecki & Beckman (1994). Rainey et al. (1993) studied 200 sexually active nulliparous teens aged 14-18 and found that those who doubted their fertility were less likely to use contraception. Radecki & Beckman found that among medically underserved women (defined as not having accessed family planning services in at least three years), those who lack knowledge of their fertility cycle are more likely to not use contraception. Also, Condelli (1986) used discriminant function analysis and found that a greater "perceived threat" of pregnancy was associated with choice of the pill vs. the diaphragm among 632 low income women aged 15-44 in a public family planning clinic.

Past experiences may be the basis for some women's perceptions of susceptibility to pregnancy. Qualitative research of low income women by Population Services International and Ann Sola in 1999 suggested that the proof of fertility provided by an unintended pregnancy (abortion or birth), or the unsettling experience of a "pregnancy scare" (negative pregnancy test) may provide at least temporary motivation for women to improve their contraception (and may be an opportunity for intervention). Bulut, in a 1984 study of 177 low income married women in Turkey, measured the impact of a recent abortion on women switching from a less to more effective contraceptive method: among women who had ***not*** just had an abortion but who received routine contraception education plus special education about the hazards of abortion, 18% switched to a more effective method; while among women who received the same education components but who ***had*** just had an abortion, 86% switched; and among a group of women who had just had an abortion but received only the routine education, the expected intermediate result was that 46% switched to a more effective method.

However, three of the reviewed studies found an association in the opposite direction between a previous unintended pregnancy and contraceptive behaviors. Peterson et al.'s 1998 study of pill-taking consistency in the NSFG found that women who had an unintended pregnancy in their history were 1.6 times more likely than those without that history to report missing two or more pills in the past three-month period.

Radecki & Beckman (1994) found that among medically underserved women, having had a past contraceptive failure was associated with current non-use of contraception. Tanfer et al. (1992) found among 630 single women age 20-29 that previous abortion was inversely associated with contraceptive use. These differing results could be related to differing factors in the research designs, including the outcome measured studied, the recency of the unintended pregnancy reported, and the risk level of the specific population studied.

In addition to Condelli's finding about "perceived threat" of pregnancy, he confirmed that more social support, fewer concerns about side effects and method effectiveness, and more concern about convenience were all associated with choice of the pill vs. the diaphragm. He also found younger women and those in a "committed sexual relationship" were more likely to choose the pill.

Condelli's finding about low income women in a "committed sexual relationship" is different from Spinelli et al.'s finding in Europe that single women were more likely to be using more effective methods, but the studies used different population groups and different measurements of relationship status. Somewhat similar to Condelli's finding, O'Campo (1993) found that low income women with only one partner were more likely to use a more effective method, while women with more than one partner were more likely to use the condom. This study points to differing needs of effective contraception vs. effective prevention of sexually transmitted disease, and suggests that the association between relationship status and effective contraception may not be clear cut.

An additional group of studies focused on use of long-acting methods like the IUD, the implant, and the injectible, which reduce the risk of method failure by guaranteeing consistent use for a longer time period. Rapkin et al. (1988) identified a problem with the accessibility of long-acting contraceptive methods. In a study of 154 low income women, they found that the 1986 reduction in IUD availability resulted in 55% of women who had been using the IUD switching to the pill, the other 45% switching to a barrier method. Their level of satisfaction with these methods was lower than that of other women using the same methods. In 1999, when the IUD was again available, Gazmararian et al. found that among low income women, low reading skills were associated with use of IUD and the implant (but also with use of douche and rhythm).

Tanfer et al. (2000) used data from the National Survey of Women in 1991, 1993, and 1995 to identify characteristics of women more likely to use the three-month injectible and the implant. The groups identified as most often using the injectible were formerly married women and those with no college degree. These groups plus a group of women with two or more children and not wanting any more children were identified as most often using the implant. Tanfer et al. also asked women who were ***not*** using each of these long-acting methods to explain their reasons. They found that those currently using a barrier method or no method were less likely than those using a medical method to say that satisfaction with their current method was their reason for not wanting to use a long-acting method. In the case of the implant, fear was more often give as a reason by women using a barrier or no method. This suggests that women might move from barrier or no method to the implant if their fears could be addressed.

The Gazmararian et al. (1999) study cited above (which found association between low literacy with IUD and implant use) is supported by similar studies and points to an interesting phenomenon. Condelli's 1986 study supports the Gazmararian et al. study in finding that less knowledge about contraception is associated with choice of the pill rather than the diaphragm. Tanfer et al. (1992) found that more education is associated with use of the less effective barrier methods among single women. It may be that level of education is a marker for how equipped women feel to handle the complexities of learning how to use coitus-dependent methods, or perhaps that contraceptive service providers believe that.

Forrest & Frost (1996) studied a wide range of outcome variables (including method use, type of method used, and consistency of use) and a wide range of independent variables (including personal, relationship, and childbearing characteristics, and experiences with contraceptive methods and services) in a telephone survey of a nationally representative sample of 1,852 low income women aged 18-34 who were sexually active and at risk of unintended pregnancy. Logistic regression controlling for other independent variables revealed contraceptive use to be half as likely for women who said they would be very glad if pregnant now, and more than 1.5 times more likely for women who were cohabiting or never-married; who had at least some college; who said they talk to partner; whose friends think contraception is important; and who were very satisfied with services at their last gynecologic or contraceptive visit. Use of a long-acting method was more likely among women with Medicaid coverage, at least some college, and with one or more children who did not want more children. Pill use was more common among women who were age 20-29 and those who were very satisfied with the services they received at their last visit. Consistent use of the pill was also associated with being very satisfied with service. Satisfaction with method was associated with use of pill or a long-acting method and being very satisfied with services.

The Forrest & Frost study raises important issues about where women receive their contraceptive services. They found clinic use to be associated with pill use and method satisfaction, but also found that consistency of pill use was inversely associated with using a clinic. Also, women whose last visit was to a private provider were more likely to be very satisfied with the service than were those visiting a clinic.

A qualitative study conducted for a family planning Medicaid waiver in California raises questions about the importance of service access vs. service quality and also points to client attitudes that may be challenging for service providers to influence. Chetkovich et al. (1999) used a focus group/follow-up questionnaire methodology with convenience samples of low income women (81 adults and 54 teens), and found that access and cost were ***not*** the large barriers to contraceptive method and service that had been expected. None of the eight adult women surveyed who were at risk of unintended pregnancy and not using contraceptives said contraception was too costly or that they did not know where to get it. Only two of them agreed they experienced any of the barriers listed in the survey, specifically, "hard to get to clinic," "hard to get an appointment," "no time" and "no transportation." While teens reported more concerns than adults for both cost and transportation barriers, the more prevalent barriers discussed in focus groups for both age groups were: ambivalence about pregnancy (especially among teens) and skepticism

about planning (in part due to relationship and job instability); doubts about contraceptive effectiveness; concerns about side effects and health risks; and service problems.

Chetkovich et al. highlight the fact that the women reported service problems other than cost and access. For example, women complained about pressure to choose a particular method, or inadequate time and attention, or felt that the advice they were offered was insufficiently tailored to their particular medical and social circumstances. Women preferred family planning services in the context of other medical care, with a single provider familiar with their health history and circumstances. They valued personal attention, sensitivity and competence, and only secondarily convenient locations, ability to get an appointment readily, and limited waiting time.

A summary of these findings by variable across studies is described in the Introduction sub-section titled "Analytic Studies of Contraceptive Behaviors" and is also listed in Table 1 on page 7.

APPENDIX B
Survey Instrument

GREET1

Hello, I'm <YOUR NAME> calling on behalf of Dr. Michael Stark of the Oregon Health Division. May I speak with <NAME>?

1. YES, SPEAKING **SKIP TO INTRO**
2. YES, RESPONDENT COMING TO PHONE. **SKIP TO GREET2**
3. NO, RESPONDENT HAS MOVED TO A DIFFERENT NUMBER. **SKIP TO NEWNUM1**
4. NO, RESPONDENT IS UNAVAILABLE. **TERMINATE**

NEWNUM1 - **ONLY GET IF GREET1 = 3**

Do you have their new phone number?

1. YES
2. NO **SKIP TO THANX DISP = 35**

ACODE - **ONLY GET IF NEWNUM1 = 1**

What is their new phone number, please? INTERVIEWER: ENTER THE NEW AREA CODE. 999 = REFUSED **SKIP TO THANX DISP = 35**

PHONE2 - **SAME AS ABOVE**

INTERVIEWER: ENTER THE NEW TELEPHONE NUMBER

NEWRESP - **SAME AS ABOVE**

INTERVIEWER: HAND-DIAL OR USE <CTRL><END> AND SET A CALLBACK

GREET2 - **ONLY GET IF GREET1 = 2 OR NEW RESPONDENT ON LINE**

HELLO, I'm <YOUR NAME> calling on behalf of Dr. Michael Stark of the Oregon Health Division. Is this

1. YES
2. NO **SKIP TO GREET1**

INTRO - **EVERYBODY**

We are conducting a study of the health practices of new mothers in Oregon. You have been chosen by the Oregon Health Division to be included in the study, and we'd like to ask you some questions about planning for your family. The interview will only take a short time, and all the information obtained in this study will be strictly confidential.

Would you like to continue in English or in Spanish?

1. ENGLISH
2. SPANISH

S1 - **EVERYBODY**

First, I need to confirm how recently you had your last baby. Was it ?

1. YES **SKIP TO S2**
2. NO
7. DON'T KNOW **SKIP TO THANX DISP = 32**
9. REFUSED **SKIP TO THANX DISP = 32**

S1A - **ONLY GET IF S1 < 7**

Did you give birth on <DATEOB> whether or not it was your more recent birth?

1. YES
2. NO **SKIP TO THANX DISP = 38**
7. DON'T KNOW **SKIP TO THANX DISP = 32**
9. REFUSED **SKIP TO THANX DISP = 32**

S2 - **ONLY GET IF S1 = 1 OR S1A = 1**

Are you or any of your children currently enrolled in the WIC program?

1. YES **SKIP TO S4**
2. NO
7. DON'T KNOW
9. REFUSED

S3 - **ONLY GET IF S2 > 1**

To know if you are eligible for a new program, I need to ask you some questions about your income. First I will define monthly family income as any money you can use, for example from a job, public assistance, child support, unemployment, or any other benefits. Including yourself, how many people does your monthly family income support?
ENTER NUMBER OF PEOPLE

77. DON'T KNOW / NOT SURE **DISP = 33 SKIP TO THANX**
99. REFUSED **DISP = 33 SKIP TO THANX**

S3a - **ONLY GET IF S3 > 14**

Could you tell me if your monthly family income is above or below $<AMOUNT> ($<AMOUNT> YEARLY) before taxes and deductions?

1. ABOVE **SKIP TO E1**
2. BELOW
7. DON'T KNOW **DISP = 33 SKIP TO THANX**
9. REFUSED **DISP = 33 SKIP TO THANX**

S4- **ONLY GET IF S3a = 2 OR S2 = 1**

Are you currently pregnant or trying to get pregnant within the next 6 months?

1. YES **SKIP TO E1**
2. NO
7. DON'T KNOW **DISP = 34 SKIP TO THANX**
9. REFUSED **DISP = 34 SKIP TO THANX**

S5 - **ONLY GET IF S4 = 2**

Have you or your partner had an operation or have a medical condition that makes you unable to get pregnant?

1. YES	**SKIP TO E1**	
2. NO		
7. DON'T KNOW	**DISP = 34**	**SKIP TO THANX**
9. REFUSED	**DISP = 34**	**SKIP TO THANX**

A1 - **ONLY GET IF S5 = 2**

In the past year, have you gotten family planning services or birth control from a county health clinic or Planned Parenthood?

1. YES	**SKIP TO A5**
2. NO	
7. DON'T KNOW	
9. REFUSED	

A2 - **ONLY GET IF A1 <> 1**

Based on the information you have provided, you may be eligible to get services in a new program. This program provides free family planning services and free birth control at county health clinics and Planned Parenthood clinics in Oregon.

In the next 6 months, how likely are you to make an appointment to get family planning services or birth control at a county health clinic or Planned Parenthood? Would you say you are likely or unlikely to make an appointment? PROBE: Is that very or somewhat?

DO NOT READ

1. VERY LIKELY	**FPEP = 2**	
2. SOMEWHAT LIKELY	**FPEP = 2**	
3. VERY UNLIKELY	**FPEP = 3**	**SKIP TO A4**
4. SOMEWHAT UNLIKELY	**FPEP = 3**	**SKIP TO A4**
7. DON'T KNOW	**FPEP = 3**	**SKIP TO A4**
9. REFUSED	**FPEP = 3**	**SKIP TO A4**

A3 - **ONLY GET IF A2 < 3**

In the next 30 days, how likely are you to make an appointment to get family planning services or birth control at a county health clinic or Planned Parenthood? Would you say you are likely or unlikely to make an appointment? PROBE: Is that very or somewhat?

DO NOT READ (SAME FORMAT AS A2)

SKIP TO BINTRO

A4.1 - A4.3 - **ONLY GET IF A2 > 2**

What are the reasons why you are not likely to make an appointment?
PROBE: What else? DO NOT READ TAKE UP TO TWO RESPONSES

11. BAD EXPERIENCE WITH BIRTH CONTROL METHOD
12. BAD EXPERIENCE WITH COUNTY HEALTH CLINIC
13. BAD EXPERIENCE WITH PLANNED PARENTHOOD
14. DON'T NEED SERVICES
15. DON'T WANT TO GO TO COUNTY HEALTH
16. DON'T WANT TO GO TO PLANNED PARENTHOOD
17. HAPPY WITH CURRENT PROVIDER
18. HAVE HEALTH INSURANCE/ OREGON HEALTH PLAN
19. HAVE NO CHILD CARE
20. JUST HAD BABY
21. NO LONGER ELIGIBLE
22. NO TIME
23. NOT AWARE OF PROGRAM
24. NOT INTERESTED IN BIRTH CONTROL
25. TRANSPORTATION PROBLEMS
26. TRYING TO GET PREGNANT
87. OTHER (specify:)
88. NONE / NO OTHERS
77. DON'T KNOW
99. REFUSED

SKIP TO BINTRO

A5 - **ONLY GET IF A1 = 1**

Based on the information you have provided, you may be eligible to get services in a new program. This program provides free family planning services and free birth control at county health clinics and Planned Parenthood clinics in Oregon.
In the next year, how likely is it that you will continue getting family planning services or birth control at a county health clinic or Planned Parenthood? Would you say you are likely or unlikely to continue going? PROBE: Is that very or somewhat? DO NOT READ

1. VERY LIKELY **FPEP = 1 SKIP TO BINTRO**
2. SOMEWHAT LIKELY **FPEP = 2**
3. VERY UNLIKELY **FPEP = 3**
4. SOMEWHAT UNLIKELY **FPEP = 3**
7. DON'T KNOW **FPEP = 3**
9. REFUSED **FPEP = 3**

A5a.1 - A5a.3 - **ONLY GET IF A5 > 1**

What are the reasons why you are somewhat likely or unlikely to continue using these services? PROBE: What else? (SAME LIST AS A4)

BINTRO - **ALL ELIGIBLE FOR PROGRAM**

Next, I will read you a number of features that a women's health care clinic might have. On a scale from 1 to 5, where 1 is "very important" and 5 is "not at all important" please tell me how important each feature is in your decision to go to that clinic for women's health care. If any of these features do not apply to you, please tell me. [THERE ARE 4 BLOCKS OF B SECTION QUESTIONS:B1-B3A, B4-B6A, B7-B9A, AND B10-B12A. THESE 4 BLOCKS ARE RANDOMIZED IN THEIR PRESENTATION TO RESPONDENTS.][FOR EACH OF THE BLOCKS IN THE B SECTION, IF THE RESPONDENT GIVES A "DON'T KNOW", "NOT APPLICABLE", OR "REFUSED" RESPONSE TO EITHER 2 OR 3 OF THE ITEMS, THE FOLLOW-UP QUESTION FOR THAT BLOCK(B3A, B6A, B9A, OR B12A) WILL BE SKIPPED.]

B1-B3 - **GET ONLY IF S5 = 2**

B1. It's easy to make an appointment over the phone.
IF NEEDED: 1 is "very important" and 5 is "not at all important".

1. VERY IMPORTANT
2.
3.
4.
5. NOT AT ALL IMPORTANT
6. DOES NOT APPLY
7. DON'T KNOW
9. REFUSED

SAME FORMAT AS B1:

B2. You can have an evening or Saturday appointment.

B3. You can get to the clinic easily with public transportation.

B3a - **SKIP IF ((b1>5 & b2>5) OR (b1>5 & b3> 5) OR (b3>5 & b2>5))**

Which of those three features is most important for you to go to this place? Is it: SELECT ONLY ONE

1. One: Making an appointment easily
2. Two: Evening or Saturday appointment, or
3. Three: Public transportation
8. NONE
7. DON'T KNOW
9. REFUSED

B4-B6 (SAME FORMAT AS B1)

B4. The clinic provides child care during your appointment.

B5. The clinic is clean and a pleasant place to be in.

B6. The waiting time in the reception area is less than 15 minutes.

B6a-**SKIP IF ((b4 > 5 & b5 > 5)OR (b4 > 5 & b6 > 5) OR (b5 > 5 & b6 > 5))**

Which of those three features is most important for you to go to this place? Is it: (SAME FORMAT AS B3a)

B7-B9 (SAME FORMAT AS B1)

B7. You feel respected by the clinic staff,no matter your race, age, or relationship status.
B8. The clinic staff makes every effort to keep all of your
B9. The clinic staff listens and responds to your individual needs.

B9a-**SKIP IF ((b7 > 5 & b8 > 5) OR (b7 > 5 & b9 > 5)OR (b8 > 5 & b9 > 5))**

Which of those three features is most important for you to go to this place? Is it: (SAME FORMAT AS B3a)

B10-B12 (SAME FORMAT AS B1)

B10. The clinic staff reminds you with a phone call or postcard about your appointment.
B11. If you were on the birth control pill you could get 12 months of pills at a time.
B12. The clinic staff calls you, after your appointment, to see how you are doing with your birth control method and answers any questions you may have.

B12a - **SKIP IF ((b10>5 & b11>5) OR (b10>5 & b12>5) OR (b11>5 & b12>5))**

Which of those three features is most important for you to go to this place? Is it: (SAME FORMAT AS B3a)

C1.1 - C1.3

You told me earlier that you are not currently pregnant or trying to get pregnant within the next 6 months. What are the main reasons why you do not want to become pregnant or have a child at this time?
PROBE ONCE: What else? DO NOT READ TAKE TWO RESPONSES

11. AGE -- TOO YOUNG
12. CAREER-ORIENTED
13. CHILDREN - ALREADY HAS
14. CHILDREN - DON'T WANT TO HAVE ANOTHER CHILD
15. COST -- NOT ABLE TO AFFORD ANOTHER CHILD
16. HEALTH CONDITIONS
17. IT'S NOT THE RIGHT TIME
18. NOT ABLE TO CARE FOR (ANOTHER) CHILD
19. NOT MARRIED / I'M SINGLE
20. NOT READY TO HAVE A(NOTHER) CHILD
21. TRYING TO GET MY LIFE IN ORDER
22. DON'T LIKE BEING PREGNANT
23. FINISHING SCHOOL
24. HAVE NO PARTNER/ NOT COMMITTED TO PARTNER
87. OTHER (specify:)
88. NONE / NO OTHERS
77. DON'T KNOW
99. REFUSED

CINTRO

Now, I will read you a list of statements that some women believe about pregnancy, planning, or birth control. As I read each one, think about yourself, and tell me whether you agree or disagree with it.

[QUESTIONS C2-C12 ARE RANDOMIZED IN THEIR PRESENTATION TO RESPONDENTS]

C2 - **GET ONLY IF S5 = 2**

C2. It would be OK if you found out you were pregnant today.
PROBE: Would you agree or disagree?
Is that Completely or Somewhat?

1. COMPLETELY AGREE
2. SOMEWHAT AGREE
3. COMPLETELY DISAGREE
4. SOMEWHAT DISAGREE
7. DON'T KNOW
9. REFUSED

SAME FORMAT AS C2:

C3. You want to have children in the future.

C4. A pregnancy would interfere with the other things you want to do in your life right now.

C5. Having three or more children is important to you.

C6. It is better to plan when and how many children you are going to have.

C7. If you get pregnant it is meant to be.

C8. It is important to have two years between your births, so you have time to focus on each baby and restore your health.

C9. Right now, you are too busy with other things in your life to use birth control.

C10. Using birth control gives you a sense of control over your life.

C11. If you were having a problem with your birth control method, you would be able to talk with your health care provider to find a solution.

C12. People who are important to you think using birth control is a good idea.

DINTRO

Now, I would like to ask you some questions about the birth control method that you use.

D1

What is your main method of birth control, if any, that you use now?

DO NOT READ LIST

11.	BIRTH CONTROL PILLS	**SKIP TO D2**
12.	DEPO PROVERA (THE SHOT / DEPO / INJECTION)	**SKIP TO D3**
13.	NORPLANT	**SKIP TO D4**
14.	AN IUD	**SKIP TO D5**

15.	A DIAPHRAGM	**SKIP TO D6**
16.	CONDOMS	**SKIP TO D7**
17.	FEMALE CONDOM	**SKIP TO D8**
18.	SPERMICIDES SUCH AS JELLY, CREAM, FOAM, SUPPOSITORIES OR FILM	**SKIP TO D10**
19.	RHYTHM METHOD OR NATURAL FAMILY PLANNING	**SKIP TO D10**
20.	WITHDRAWAL	**SKIP TO D10**
23.	ABSTINENCE	**SKIP TO D9a**
87.	OTHER (Specify:)	**SKIP TO D10**
88.	NONE	**SKIP TO D9**
77.	DON'T KNOW	**SKIP TO E1**
99.	REFUSED	**SKIP TO E1**

D2 - **ONLY GET IF D1 = 11**

How often do you take the pill everyday? Would you say . . . ? READ:

1.	Always	**SKIP TO D2a**
2.	Almost always	**SKIP TO D2b**
3.	Almost never	**SKIP TO D2b**
8.	Never	**SKIP TO D2b**
7.	DON'T KNOW	
9.	REFUSED	

D2a - **ONLY GET IF D2 = 1**

How long have you been taking the pill everyday? READ IF NECESSARY

1.	Less than 6 months, OR	**BCM = 1**	**SKIP TO D10**
2.	6 months or longer	**BCM = 1**	**SKIP TO D10**
7.	DON'T KNOW		
9.	REFUSED		

D2b- **ONLY GET IF D2 = 2,3 OR 8**

In the next 6 months, how likely are you to take the pill everyday? Would you say you are likely or unlikely?
PROBE: Is that very or somewhat? DO NOT READ

1.	VERY LIKELY	**BCM = 2**	**SKIP TO D2c**
2.	SOMEWHAT LIKELY	**BCM = 2**	**SKIP TO D2c**
3.	VERY UNLIKELY	**BCM = 3**	**SKIP TO D10**
4.	SOMEWHAT UNLIKELY	**BCM = 3**	**SKIP TO D10**
7.	DON'T KNOW	**SKIP TO D10**	
9.	REFUSED	**SKIP TO D10**	

D2c- **ONLY GET IF D2b = 1 OR 2**

In the next 30 days, how likely are you to take the pill everyday? (SAME FORMAT AS D2b)

SKIP TO D10

D3 - **GET ONLY IF D1 = 12** (SAME FORMAT AS D2)

D3. Do you get your shot every three months?
D3a. How long have you been getting the shot every three months?
D3b - **GET ONLY IF D3 = 2, 3, OR 8**
In the next 6 months, how likely are you to get your shot at the right time?
D3c In the next three months, how likely are you to get your shot at the right time?

SKIP TO D10

D4 - **GET ONLY IF D1 = 13** (SAME FORMAT AS D2a)

How long have you had Norplant in your arm?

SKIP TO D10

D5 - **GET ONLY IF D1 = 14** (SAME FORMAT AS D2a)

How long has your IUD been inserted?

SKIP TO D10

D6 - **GET ONLY IF D1 = 15** (SAME FORMAT AS D2)

D6. How often do you use a Diaphragm every time you have sexual intercourse?
D6a. How long have you been using a Diaphragm every time you have sexual intercourse?
D6b. - **GET ONLY IF D6 = 2, 3, OR 8**
In the next 6 months, how likely are you to use a Diaphragm every time you have sexual intercourse?
D6c. In the next 30 days, how likely are you to use a Diaphragm every time you have sexual intercourse?

SKIP TO D10

D7 - **GET ONLY IF D1 = 16 (FORMAT SAME AS D2)**

D7. How often do you use a condom every time you have sexual intercourse?
D7a. How long have you been using a condom every time you have sexual intercourse?
D7b - **GET ONLY IF D7 = 2, 3, OR 8**
In the next 6 months, how likely are you to use a condom every time you have sexual intercourse?
D7c In the next 30 days, how likely are you to use a condom every time you have sexual intercourse?

SKIP TO D10

D8 - **GET ONLY IF D1 = 17**

Female condom: SAME FORMAT AS D7-D7c

D9.1 - D9.3 - **GET ONLY IF D1 = 88**

What are the reasons you are not using a birth control method?
PROBE: What else? DO NOT READ TAKE UP TO TWO RESPONSES

11. AGAINST MY VALUES
12. COST / CAN'T PAY FOR BIRTH CONTROL
13. DON'T LIKE SIDE EFFECTS
14. DON'T THINK I CAN GET PREGNANT
15. DON'T WANT TO USE
16. FORGET TO GET OR USE
17. HUSBAND / PARTNER DOES NOT WANT TO USE IT
18. NOT HAVING SEX
19. TOO MUCH TROUBLE TO GET OR USE
20. WANT TO GET PREGNANT
87. OTHER (specify:)
88. NONE / NO OTHER
77. DON'T KNOW
99. REFUSED

D9a - **GET ONLY IF D1 = 23 OR D1 = 88**

Do you think you will have sexual intercourse in the next 6 months?
DO NOT READ 1. YES
2. NO **SKIP TO D18**
7. DON'T KNOW
9. REFUSED

D9b - **GET ONLY IF D9a = 1**

What birth control method, if any, are you planning to use?
(SAME AS LIST IN D1)
SKIP TO D11

D10 - **GET ONLY IF (D1 <> 77, 99, 23, OR 88)**

Are you likely or unlikely to change to a
different birth control method in the next 6 months?
PROBE: Is that very or somewhat?

1. VERY LIKELY **SKIP TO D10a**
2. SOMEWHAT LIKELY **SKIP TO D10a**
3. VERY UNLIKELY **IF D1=11,12,13,OR 14, SKIP TO D11, ELSE SKIP TO D11a**
4. SOMEWHAT UNLIKELY **IF D1=11,12,13,OR 14, SKIP TO D11, ELSE SKIP TO D11a**
7. DON'T KNOW
9. REFUSED

D10a - **GET ONLY IF (D10 = 1 OR 2)**

What method are you likely to change to?
(SAME LIST AS D1)

D11- **ONLY GET IF (D10a = 11, 12, 13, OR 14)**

Here are a few methods that are considered more effective in preventing pregnancy. You may already know about some of these methods. Birth control pills are taken everyday to prevent pregnancy. Depo Provera is an injection that prevents pregnancy for 3 months at a time. Norplant is six tubes that are implanted into a woman's arm and prevent pregnancy for up to 5 years. And IUD is inserted into a woman's uterus to prevent pregnancy for up to 10 years.

Now, I am going to read a list of possible advantages for using these methods.

As I read each one, please tell me if it is important or unimportant in your decision to use these methods.

SKIP TO D11b

D11a

Imagine that you are trying to decide which method to use.

(Add intro from D11)

[QUESTIONS D11b - D11g ARE RANDOMIZED IN THEIR PRESENTATION TO RESPONDENTS]

D11b - **GET ONLY IF (D1 <> 77 OR 99) and (D9a <>2)**

The pill can regulate your period.

PROBE: Is this important or unimportant? Is that Very or Somewhat?

1. VERY IMPORTANT
2. SOMEWHAT IMPORTANT
3. VERY UNIMPORTANT
4. SOMEWHAT UNIMPORTANT
7. DON'T KNOW
9. REFUSED

D11c-D11g (SAME FORMAT AS D11b)

D11c. The pill can help clear up your complexion.

D11d. With Depo Provera, Norplant, or an IUD you do not have to remember to take a pill everyday.

D11e. You can use Depo Provera without your partner knowing.

D11f. By using the pill, Depo Provera, Norplant or an IUD you have more peace of mind.

D11g. By using the pill, Depo Provera, Norplant or an IUD you do not have to interrupt sex.

D12 - **IF ((D1 < 15 & D1 > 10) OR (D9b < 15 & D9b > 10) OR (D10a < 15 & D10a > 10)) OR (D9a = 2) SKIP TO D18.**
Respondents get this question if they do not choose "The Pill", "Depo Provera", "Norplant", or "IUD" for questions D1, D9b, or D10a. They also do not get this question if they are not planning to have sexual intercourse in the next six months (D9a = 2).

Now that I have mentioned some possible advantages of using a more effective method of preventing pregnancy, how likely would you be to start using the pill, Depo Provera, Norplant, or an IUD in the next 6 months? Would you say you are likely or unlikely?
PROBE: Is that very or somewhat?

1. VERY LIKELY **SKIP TO D12a**
2. SOMEWHAT LIKELY **SKIP TO D12a**
3. VERY UNLIKELY **BCM = 3** **SKIP TO D12b**
4. SOMEWHAT UNLIKELY **BCM = 3** **SKIP TO D12b**
7. DON'T KNOW
9. REFUSED

D12a

What method are you likely to start using? The . . . ?
READ

1. Pill
2. Depo Provera
3. Norplant, or
4. IUD?
7. DON'T KNOW
9. REFUSED

SKIP TO D18

D12b - **GET ONLY IF (D12 = 3 OR 4)**

What is the main reason you are not likely to start using one of these methods? DO NOT READ

1. COST / TOO EXPENSIVE
2. DON'T WANT TO USE HORMONAL METHOD
3. PARTNER NOT SUPPORTIVE
4. DON'T LIKE THE SIDE EFFECTS
5. NO TIME
6. OTHER (specify:)
7. DON'T KNOW
9. REFUSED

D18 - **GET ONLY IF (D1 <> 77 or 99)**

Now, I would like to ask you some questions about preventing pregnancy. If a woman has just had sex and thinks she might become pregnant, is there anything she can do in the next few days to prevent the pregnancy? DO NOT READ

1. YES
2. NO **SKIP TO D18b**
7. DON'T KNOW **SKIP TO D18b**
9. REFUSED **SKIP TO D18b**

D18a.1 - D18a.8

What can she do? DO NOT READ CHECK ALL THAT APPLY

11. RU-486/FRENCH ABORTION PILL
12. BIRTH CONTROL PILLS
13. MORNING-AFTER PILLS / DAY AFTER PILL **SKIP TO D18c**
14. EMERGENCY CONTRACEPTION **SKIP TO D18c**
15. PREVEN
16. PLAN B
87. OTHER (specify:)
88. NONE / NO OTHERS
77. DON'T KNOW/NOT SURE
99. REFUSED

D18b

Have you ever heard of morning-after pills or emergency contraception?
DO NOT READ 1. YES
2. NO
7. DON'T KNOW
9. REFUSED

D18c

The morning-after pills or emergency contraception are a Special combination of birth control pills used to prevent pregnancy up to 3 days after unprotected sex. If you had unprotected sex and wanted to prevent pregnancy would you be likely or unlikely to take them? PROBE: Is that very or somewhat?

1. VERY LIKELY
2. SOMEWHAT LIKELY
3. VERY UNLIKELY
4. SOMEWHAT UNLIKELY
7. DON'T KNOW
9. REFUSED

E1 - **GET ONLY IF (S1 = 1)**

For my next questions, I'm going to ask you about the time just before you got pregnant. It may be difficult to remember back that far, but please try.

Thinking back to just before you got pregnant with your last child, tell me if you agree or disagree with the following statements. If any of these statements do not apply to you, please tell me.

SKIP TO E1bi

E1a - **GET ONLY IF (S1a = 1)**

For my next questions, I'm going to ask you about the time just before you got pregnant with your next to last child. It may be difficult to remember back that far, but please try. Thinking back to just before you got pregnant with your next to last child, tell me if you agree or disagree with the following statements. If any of these statements do not apply to you, please tell me.

E1bi

Before you got pregnant, it was your belief that it is better to plan when and how many children to have. Would you agree or disagree? Is that Completely or Somewhat? DO NOT READ

1. COMPLETELY AGREE
2. SOMEWHAT AGREE
3. COMPLETELY DISAGREE
4. SOMEWHAT DISAGREE
8. DOES NOT APPLY
7. DON'T KNOW
9. REFUSED

E1bii

Before you got pregnant, it was your belief that if you got pregnant it was meant to be. (SAME FORMAT AS E1bi)

E1biii

You wanted to get pregnant.
Would you agree or disagree? PROBE: Is that Completely or Somewhat?
DO NOT READ

1. COMPLETELY AGREE **SKIP TO F1**
2. SOMEWHAT AGREE
3. COMPLETELY DISAGREE
4. SOMEWHAT DISAGREE
8. DOES NOT APPLY
7. DON'T KNOW
9. REFUSED

E1c- E1K (SAME FORMAT AS E1b)

E1c. You didn't think you were going to have sex.
E1d. You thought your birth control method would prevent pregnancy.
E1e. You did not think you could get pregnant.
E1ei. You thought you were not in the fertile part of your cycle.
E1eii. You thought you had a medical problem that would make you unable to get pregnant.
E1eiii. You thought your partner was not fertile or had a medical problem that would make you unable to get pregnant.
E1f. You didn't want to use birth control.

E1g. Your husband or partner didn't want to use birth control.
E1h. You could not pay for birth control.
E1i. It was too much trouble to get or use birth control.
E1j. You forgot to get or use your birth control.
E1k. You had been having side effects for the birth control you were using.

E2.1 - E2.13

In the month before you got pregnant, what kind(s) of birth control were you or your partner using, if any?
PROBE: What else? TAKE ALL RESPONSES (SAME LIST AS D1)

E3.1 - E3.9

Where were you or your partner getting your birth control method?
PROBE: "Where else?" CHECK ALL THAT APPLY DO NOT READ LIST

11. A FAMILY PLANNING CLINIC OR PLANNED PARENTHOOD
12. A HEALTH DEPARTMENT CLINIC
13. A COMMUNITY HEALTH CENTER
14. A PRIVATE GYNECOLOGIST
15. A GENERAL OR FAMILY PHYSICIAN
16. DRUG STORE OR OTHER STORE
17. NO PLACE
87. OTHER (specify:)
88. NO OTHER PLACE
77. DON'T KNOW
99. REFUSED

E4i - **ONLY GET IF (E2 <> 11, 12, 13, OR 14)**

During the year before you got pregnant did you use birth control pills, Depo Provera, Norplant, or an IUD?

1. YES →→
2. NO →→ **SKIP TO E4**
7. DON'T KNOW →→ **SKIP TO E5**
9. REFUSED →→ **SKIP TO E5**

E4ii.1 - E4ii.7

So you used one of those methods. What were the reasons you stopped using one of those methods?
[DO NOT READ] [TAKE ALL RESPONSES] [PROBE: "What else?"]

10. COST / TOO EXPENSIVE
11. DON'T WANT TO USE HORMONAL METHOD
12. PARTNER NOT SUPPORTIVE
13. DON'T LIKE THE SIDE EFFECTS
14. NO TIME
15. WANTED TO GET PREGNANT
87. OTHER (specify:) 88.NONE/NO OTHER
77. DON'T KNOW 99.REFUSED

SKIP TO E5

E4 - **ONLY GET IF (E2 <> 11, 12, 13, OR 14) AND (E4i = 2)**

During the year before you got pregnant did you consider using birth control pills, Depo Provera, Norplant, or an IUD?

1. YES → **SKIP TO E4a**
2. NO → **SKIP TO E4b**
7. DON'T KNOW
9. REFUSED

E4a.1 - E4a.7 - **ONLY GET IF (E4 = 1)**

So you considered using one of those methods. What were the reasons you did not end up using one of those methods?
PROBE: What else? DO NOT READ TAKE ALL RESPONSES (SAME LIST AS E4ii)

E4b.1 - E4b.7 - **ONLY GET IF (E4 = 2)**

What were the reasons you did not consider using one of those methods?
PROBE: What else? DO NOT READ TAKE ALL RESPONSES (SAME LIST AS E4ii)

E5 - **ONLY GET IF (S1 = 1)**

Now, please think back to just before you got pregnant with your last child. How did you feel about becoming pregnant? Would you say you . . . ?
IF NECESSARY PROMPT: Your best guess is fine
READ CHOICES

1. Wanted to be pregnant sooner,
2. Wanted to be pregnant later,
3. Wanted to be pregnant then,
4. Or, did not want to be pregnant then or at any time in the future
7. DON'T KNOW
9. REFUSED

SKIP TO F1

E5a - **ONLY GET IF (S1a = 1) SKP**

Now, please think back to just before you got pregnant with your next to last child. How did you feel about becoming pregnant? Would you say you . . . ? (SAME AS E5)

F1 - **ALL RESPONDENTS GET THIS QUESTION**

We are almost finished, just a few more questions.
What is your age please? ENTER AGE IN YEARS

7. DON'T KNOW / NOT SURE
9. REFUSED

F2

How many children have you given birth to?
DO NOT READ ENTER NUMBER OF CHILDREN
6. 6 OR MORE
8. NONE
7. DON'T KNOW
9. REFUSED

F3

Which of the categories best describes your racial/ethnic background?
READ LIST
1. White or Anglo,
2. Black or African American,
3. Hispanic or Latino,
4. American Indian,
5. Alaskan Native,
6. Asian or Pacific Islander,
7. Or something else? (specify:)
8. DON'T KNOW
9. REFUSED

F4

Are you . . .? READ LIST
1. Married or living with a partner or boyfriend
2. Divorced
3. Widowed
4. Separated
5. Never married or single
7. DON'T KNOW
9. REFUSED

F5

What is the highest grade or year of school you completed?
1. Never attended school or only attended kindergarten
2. Grades 1 through 8 (Elementary)
3. Grades 9 through 11 (Some high school)
4. Grade 12 or GED (High school graduate)
5. College 1 year to 3 years (Some college or technical school)
6. College 4 years or more (College graduate)
7. DON'T KNOW
9. REFUSED

F6

Do you have health insurance through the Oregon Health Plan?
1. YES **SKIP TO F7**
2. NO
7. DON'T KNOW
9. REFUSED

F6i

Do you have any other health insurance?

1. YES
2. NO **SKIP TO F7**
7. DON'T KNOW **SKIP TO F7**
9. REFUSED **SKIP TO F7**

F6a - **ONLY IF (F6i = 1)**

Does your health insurance pay for birth control methods?

1. YES
2. NO **SKIP TO F7**
7. DON'T KNOW **SKIP TO F7**
9. REFUSED **SKIP TO F7**

F6b - **ONLY IF (F6a = 1)**

Does your health insurance pay for all or some of the cost of birth control methods?

1. ALL
2. SOME
7. DON'T KNOW
9. REFUSED

F7

Talking with you has been so helpful. If we have other surveys in the future, could we call you again? (SAME FORMAT AS F6)

CLOSING

If you would like any further information about the free family planning services and birth control program, you can contact your local county health clinic or Planned Parenthood or call Oregon Safenet for the clinic nearest you. Would you like the number? 1-800-723-3638.

THANX

That's the last question. Thank you so much for your time and help!

APPENDIX C
Slides for Oral Exam Presentation

Every pregnancy wanted and well-timed

1

Characteristics Associated with Use of an Effective Contraceptive Method Among Low Income Mothers Using some type of Reversible Method

or

"What are the odds, baby?"

Kara Stebbins
MPH Thesis Presentation

2

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  - Oregon Health Division
    Family Planning Expansion Project (FPEP)
  - Population Services International

3

Why this topic?

- Half (49%) of U.S. pregnancies unintended
- Among low income women, 61% unintended
- Associated health risks & financial costs
- Using an effective contraceptive method can prevent unintended pregnancy

4

How effective is "effective" ?

No method = 85 pregnancies per 100 typical users in 12 months

More effective < 7.0
Hormonal implant = 2.3
Hormonal injection = 3.2
IUD = 3.7
Birth control pill = 6.9
Less effective >7.0
Diaphragm = 8.1
Condom = 8.7
Other = 15-32

5

Other method characteristics to consider

More effective
Need doctor appointment
Side effects
No STD protection
More expensive
Less effective
More easily available
STD protection (condom)
Less expensive

6

One way to afford an effective method in Oregon

Medicaid Program	Eligibility based on Federal Poverty Level
Basic Medicaid (Oregon Health Plan)	< 100% fpl
Program for pregnant & postpartum women, @$4,500 per woman/infant	< 170% fpl
OHD FPEP waiver for contraceptive methods & services only, @$225 per woman (implemented 01-01-99)	*< 185% fpl*

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Research opportunity:
Telephone survey of women on Medicaid due to a recent birth

- Part of OHD FPEP comprehensive research plan
- Primary OHD objectives
  - Understand etiology of unintended pregnancy
  - Assess readiness to use FPEP services
- Thesis objective
  - Understand issues related to use of effective contraceptive methods

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Basic research question

Among low income Caucasian women in Oregon who had Medicaid coverage due to a recent birth and who are now using a reversible method,

What are the characteristics associated with use of an effective contraceptive method?

9

Research question, part 1

- Background:
  - Unintended pregnancy opportunity for intervention?
  - Mixed findings in previous research
  - Need to prioritize interventions
- Hypothesis 1:
  Women whose recent birth was unintended are more likely to use an effective method than those whose recent birth was intended

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Research question, part 2

- Background:
  - Consistent findings in previous research
  - Need to confirm in Oregon
- Hypothesis 2:
  Women with health insurance are more likely to use an effective method than those without health insurance

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Research question, part 3

- Chetkovich et al. 1999 qualitative study:
  Ambivalence greater than cost as a barrier to "use of a contraceptive method" ?
  - Seems contrary to priorities of FPEP
  - Need quantitative results re: "use of an effective method"
- Hypothesis 3:
  The strength of the association between "ambivalence" about pregnancy and use of an effective method is ***less*** than the association for health insurance status.

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Procedures
for OHD study

- OHD Institutional Review Board exemption
- Names, address, phone #s from Medicaid agency for letter then phone call
- 15 minute survey in English or Spanish

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Subjects
for OHD study

- Subject Criteria
  - Recent Medicaid birth conceived before FPEP 01-01-99
  - Not enrolled in OHP at conception.
- 1,588 calls Feb 21-27 2000
- 56% (891) possible to reach
- 6% direct refusals, 26% didn't call back
- 68% completed survey → 606 OHD subjects

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Subjects
for Thesis

- ID info removed & OHSU IRB exemption
- Additional criteria:
  - At risk of unintended pregnancy
  - Income <185% fpl
  - Using a reversible method
  - Caucasian
  - March-June 1999 births (8-12 months before survey)
- 12 missing data → 308 total Thesis subjects

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Measurements

- Demographics
  ("Cohabiting" = married or otherwise cohabiting)
- Type of contraceptive used
- Intention status of recent birth
- Financial access
- Attitudes about pregnancy & planning
- Perceptions social & other support for contraception

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Measurements:
Type of Contraceptive Used

- Before recent pregnancy (only measured for women with an unintended birth)
- After recent birth (outcome variable)
- "Effective method" = hormonal method or IUD

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Measurements:
Intention status of recent birth

- "Thinking back to *just before* you got pregnant with your new baby, how did you feel about becoming pregnant?"
  - Intended birth: "I wanted to be pregnant sooner" / "I wanted to be pregnant then"
  - Unintended birth: "I wanted to be pregnant later" / "I didn't want to be pregnant then or at any time in the future"
- Completely disagreed with the statement "You wanted to be pregnant"

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Measurements: *Financial Access*

- Current health insurance status = public + private = yes/no
- Public family planning clinic use =
  - Yes, in past year, i.e. after the recent birth
  - No, but interested in future
  - No, and not interested in future
- Income level before recent birth (from Medicaid file) = <100% or >100% fpl

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Measurements: *Attitudes & Perceptions*

- Question format
  - Statement
  - Agree or Disagree?
  - Completely or Somewhat?
- "Calculation" of dichotomous variables
  - Completely agree vs. other three categories
  - Completely disagree vs. other three categories

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Measurements: *Attitudes*

- "It is *better to plan* when and how many children you are going to have"
- "If you get pregnant it is *meant to be*"
- "A pregnancy would *interfere* with the other things you want to do in your life right now"
- "It would be *OK* if you found out you were pregnant today"

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Measurements: *Calculated variable*

Ambivalent about pregnancy =

- Agreed a pregnancy would be *OK*
  and
- Did not completely agree it would *interfere*

Unambivalent about pregnancy =

- Completely agreed a pregnancy would *interfere*
  or
- Completely disagreed it would be *OK*

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Measurements: *Perceptions*

- "People who are important to you think using birth control is a good idea" *(social support)*
- "Using birth control gives you a *sense of control* over your life"
- "Right now, you are *too busy* with other things in your life to use birth control"
- "If you were having a problem with your birth control, you'd be *able to talk* with your provider to find a solution"

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Analysis

- Univariate description of all measured variables
  - 308 subjects → univariate precision +/-6%
- Bivariate analysis for all measured variables
  - Interactions with demographic variables
  - Chi square power analysis (PASS 6.0)
- Multivariate logistic regression (SPSS 9.0)

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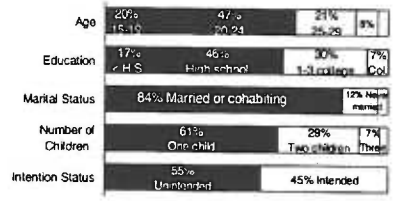
Analysis:
Multivariate Modeling

- Full model
  - Excluded "Public clinic use" on theoretical grounds
  - All other dichotomous variables p<.25 in bivariate
- Removal of variables
  - Non-significant
  - Non-confounding
  - Non-interacting
- Forward stepwise for interactions

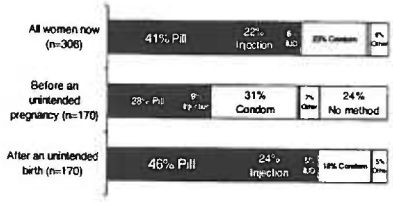
25

Description of the women:
Demographics & Intention status



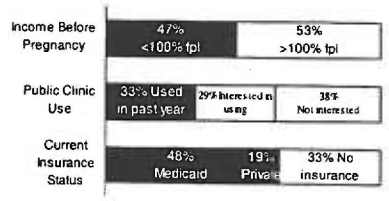
26

Description of the women:
Type of contraceptive method used



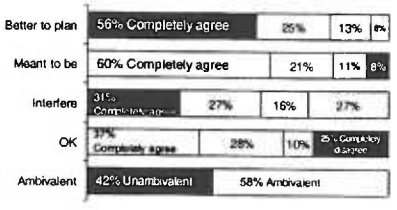
27

Description of the women:
Financial access



28

Description of the women:
Attitudes about pregnancy & planning



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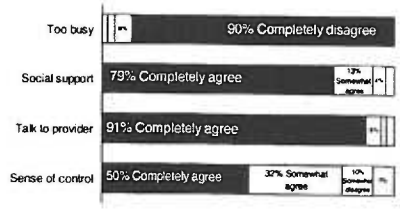
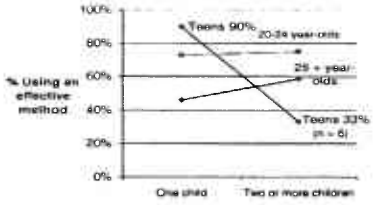
Description of the women:
Perceived Social & Other Support



30

Bivariate interaction: *Age & Number of children*



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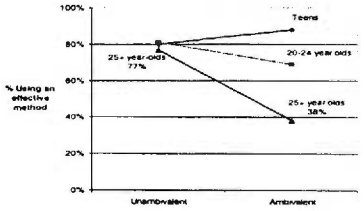
Bivariate interaction: *Age & Ambivalence about pregnancy*



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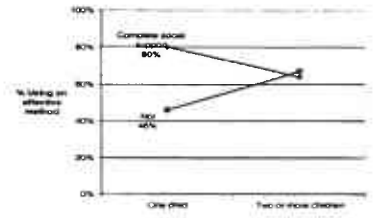
Bivariate interaction: *Number of children & Social support*



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Multivariate model: *Main effects*

	Adjusted Odds Ratio	Confidence Interval	p for Wald Statistic
Not cohabiting vs. Cohabitting	5.1	1.5 - 17.6	0.01
Having insurance vs. Not	3.1	1.7 - 5.7	<.01
Feeling that birth control gives you a sense of control over your life vs. Not	2.7	1.5 - 5.0	<.01

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Multivariate model: *Interactions*

	Adjusted Odds Ratio	Confidence Interval	p for Wald Statistic
Unambivalent about pregnancy vs. Ambivalent			
Women 25 and older	4.5	1.7 - 12.0	<.01
Women younger than 25	0.7	0.3 - 2.0	0.61
Having more social support for using birth control vs. Not			
Women with one child	4.9	2.0 - 12.0	<.01
Women with two or more childre	1.3	0.4 - 3.4	0.66

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Other variables: *Financial access*

- Income before birth, p>.25
- Public clinic used vs. Not = Crude OR 3.9 (2.0-7.3)
- Public clinic used vs. *Interested* in using public clinic = Crude OR 4.3 (2.1-8.7)

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Other variables

- Significant in univariate:
  - < College degree vs. College = Crude OR 2.7 (1.1-6.3)
  - Unintended vs. Intended = Crude OR 1.8 (1.1-3.0), power 69%
- Not significant in univariate:
  - "Better to plan" vs. Not = Crude OR 1.4 (0.9-2.3)
  - "Meant to be", p>.25
  - "Not too busy" vs. Not = Crude OR 2.0 (0.9-4.3)
  - "Able to talk" p>.25

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Discussion: *Hypothesis 1*

Women whose recent birth was unintended are more likely to use an effective method than those whose recent birth was intended

- Supported in univariate (OR 1.8) but not multivariate
  - Insufficient power
  - Multi-colinearity
  - Under-reporting of unintended birth
  - Two directions of causality

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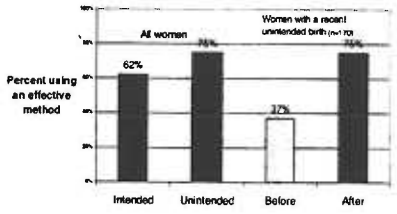
Discussion: *Appropriate comparison group in Hypothesis 1?*



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Discussion: *Hypothesis 2*

Women with health insurance coverage are more likely to use an effective method than those without insurance

- Supported in univariate & multivariate (adjusted OR 3.1, CI 1.7-5.6)

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Discussion: *Hypothesis 3*

The strength of the association between "ambivalence" about pregnancy and use of an effective method is ***less*** than the association for health insurance status

- Ambivalence OR among women 25+ (4.5) ***greater*** than Health insurance OR (3.1) for all women (consistent with Chetkovich et al.)
- Ambivalence association among women 25+, but not among younger (inconsistent with Chetkovich et al.)
- Appropriate comparison group?

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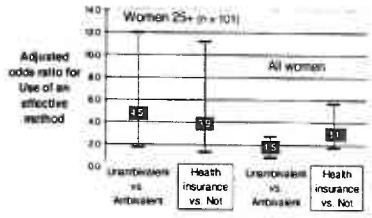
Discussion: *Comparison of Health insurance & Ambivalence*



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Discussion: Limitations

- Power to detect associations
- Social desirability bias in telephone survey
- Validity & reliability of attitudinal variables
- "Missing" attitudinal variables
  - Concern about side effects
  - Perceived STD risk

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Discussion: Limitations

- Cross-sectional study & causality
- Representativeness of sample
  - OHD response rate, similar income, different race
  - % age, % effective & % unintended similar to PRAMS
  - Different parity & race than broader population of interest
- Multiple dimensions of effective contraception
  - Using any type of method
  - Using an effective method
  - Consistent use of chosen method

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Future research

- Address limitations
- Other outcome variables in OHD database
  - Consistency of use
  - Interest in emergency contraception
- Other "unintended events"
  - Unwanted birth
  - Abortions
  - Negative pregnancy test "scares"

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Implications

- Identify specific groups for interventions to increase use of effective methods
  - Cohabiting women
  - Older women who are ambivalent about pregnancy
  - Women with one child & less social support

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Implications

- Intervene after an unintended birth
- Expand contraceptive counseling
  - Ambivalence
  - Social support
  - Sense of control
- Improve financial access
  - Assess barriers to Basic Medicaid in Oregon
  - Increase access to public clinics
  - Increase insurance coverage

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Every pregnancy wanted and well-timed

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