

## TRENDS IN KNOWLEDGE OF EMERGENCY CONTRACEPTION AMONG WOMEN IN CALIFORNIA, 1999–2004

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Received 21 June 2006; revised 9 October 2006; accepted 9 November 2006

**Objective.** To examine trends in knowledge of emergency contraception (EC) and determine whether disparities in knowledge have persisted over time.

**Study Design.** This study is based on 6 years of the California Women's Health Survey, a population-based telephone survey. We examine predictors of EC knowledge among 11,998 women age 18–44.

**Results.** Between 1999 and 2004, the percentage of women aware of EC increased from 40–57%. Despite this increase, disparities in EC knowledge based on women's age, race/ethnicity, and socioeconomic status persist. Foreign-born Hispanic women, women whose income falls below the poverty level, and women who did not complete high school reported the lowest levels of EC knowledge in 2004.

**Conclusions.** Education efforts may increase overall knowledge of the method. However, efforts must tailor these messages to women who may be outside the reach of traditional media and remain unaware of EC.

### Introduction

Nearly one half of the 6.3 million pregnancies occurring annually in the United States are unintended, and one half of unintended pregnancies end in abortion (Henshaw, 1998). Emergency contraception (EC) pills, also known as the "morning after pill," have the potential to avert an estimated 1.7 million unintended pregnancies annually, thereby reducing the number of abortions in the US by as much as half (Jones, Darroch, & Henshaw, 2002). Progestin-only EC pills reduce the chance of pregnancy by 87% when taken within 3–5 days of unprotected intercourse or contraceptive failure, and combined hormone EC pills reduce the risk of preg-

nancy by 54–77% if taken within 120 hours of unprotected intercourse or contraceptive failure (Ellerston et al., 2003; Rodrigues, Grou, & Joly, 2001; Trussell, Rodriguez, & Ellerston, 1999). Emergency contraception's safety has been well established (Espinosa et al., 1999; Glasier, 1998), and the vast majority of women who use EC are satisfied with their experience of the method (Harvey, Beckman, Sherman, & Petitti, 1999).

Despite its potential to prevent unintended pregnancy, knowledge and utilization of EC among women in the US is not widespread. A national survey conducted in 2003 found that whereas more than two thirds of women had heard of a method to prevent pregnancy after unprotected intercourse, few women could identify the method or describe how to obtain it (Salganicoff, Ranji, & Wyn, 2004). A 1998 telephone survey of US teens found that only 24% of young men and 33% of young women in the US had heard of EC. Further, fewer than 1 in 10 knew that the method could be used up to 72 hours after unprotected intercourse (Delbanco et al., 1998). In a sample of inner-city women in Boston, knowledge of EC among Latina women was half that of knowledge among white

Funded by a grant from The California Wellness Foundation (TCWF). Created in 1992 as an independent, private foundation, TCWF's mission is to improve the health of the people of California by making grants for health promotion, wellness education and disease prevention programs.

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women and a quarter that of African American women (Chuang & Freund, 2005). Previous research in California has demonstrated low levels of EC knowledge among women with low incomes or low educational attainment (Foster et al., 2004; Jackson, Schwarz, Freedman, & Darney, 2000).

Six years after its approval by the federal Food and Drug Administration, fewer than 6% of US women and 9% of Californian women report ever having used EC (Salganicoff et al., 2004). One factor contributing to low utilization levels is lack of awareness about the method. In California, several public and private programs have been launched in recent years to increase knowledge of EC and make EC more accessible. California women can get EC from trained pharmacists without a prescription from a physician under the state's pharmacy access legislation (Foster et al., 2006). Public education campaigns aired on local television, radio, and print media in many of California's most populated counties. A limited number of media advertising designed to reach Spanish-, Korean-, and Vietnamese-speaking communities soon followed. In the spring of 2003, radio stations in Los Angeles and San Francisco aired advertisements on the availability of pharmacy access to EC. Today, print campaigns sponsored by the Pharmacy Access Partnership regularly circulate printed educational materials to a network of 2,000 community-based organizations, including clinics, health departments, and social agencies. A statewide EC telephone helpline and Web site has been implemented and currently attracts >30,000 visitors annually. In addition to reaching the general public with information about EC, efforts to educate physicians, pharmacists, and other health care providers have also been implemented. To date, the Pharmacy Access Partnership has trained >3,000 pharmacists on providing pharmacy access to EC (Monastersky & Landau, 2006).

For women to take advantage of the availability of this safe, effective backup method of contraception, they must be aware of EC and know how to access it. California's diverse population allows for exploration into disparities in EC knowledge among women by race/ethnicity, socioeconomic status, and health care access. Baseline levels of EC knowledge were assessed in California in 1999, before initiation of most of the programs described (Foster et al., 2004). The purpose of this study is to gain an understanding of how knowledge of EC has changed in California since implementation of these policies and campaigns, and in particular, whether disparities in EC knowledge have persisted over time.

## Methods

This study is based on 6 years of data (1999–2004) from the California Women's Health Survey (CWHHS),

an annual, population-based telephone survey of approximately 4,000 randomly selected adult women (age  $\geq 18$ ) in California. The CWHHS began in March 1997 as a collaborative effort between the California Department of Health Services, Mental Health, Alcohol and Drug Programs, and Social Services; the California Medical Review, Inc; and the Public Health Institute. Questionnaire development and funding for the survey was provided by the collaborating programs. Analyses, findings, and conclusions described in this paper are not necessarily endorsed by these programs. Information about individuals' demographic background, health care access, and health insurance status was collected through computer-assisted telephone surveys conducted in both English and Spanish. The percentages of eligible women who agreed to participate in the CWHHS were 81% in 1999, 74% in 2000 and 2001, 72% in 2002 and 2003, and 74% in 2004.

Beginning in 1999, 2 questions about EC were added to the CWHHS. The EC questions were asked of women who had ever had sexual intercourse, but had not had a hysterectomy. A total of 13,553 women of reproductive age participated in the CWHHS between 1999 and 2004. Of those, 11,998 responded to the 2 EC questions; 506 reported having had a hysterectomy, 332 reported never having had sex, 428 refused to answer the questions, and 287 were inadvertently skipped. Women were more likely to refuse in 2003 and 2004 than in previous years (10%, compared to <1% in previous years). Because the CWHHS does not survey women age <18, this analysis is limited to women 18–44 years old. Results are weighted to reflect sample design and the age and racial/ethnic composition of California women in the 2000 census.

All women eligible for the EC questions were first asked: "To the best of your knowledge, if a woman has unprotected sex is there anything she can do in the 3 days after intercourse that will prevent pregnancy?" Women who responded "yes" were then asked a second, open-ended question: "What can she do?" These analyses examine the responses to these questions and categorize all women who responded to the EC module into 4 groups: respondents who did not know about EC; respondents who could not correctly name a method of EC; respondents who gave an answer that was imprecise, but could correctly describe EC, such as "seek medical attention," or "a pill, don't know name"; and respondents who correctly identified EC. We use these 4 groups to show trends in the responses to both questions over time. For the analyses of sociodemographic predictors of EC knowledge, we created a dichotomous variable by collapsing the 4 categories. For this dichotomous variable, we treat imprecise responses and correct identification of a method of EC as knowledge of EC. Women who stated that they did not know that a woman could

prevent pregnancy after intercourse (in response to the first EC question) or who gave an incorrect response to the open-ended question were considered to not know about EC.

We used bivariate and multivariate analyses to estimate knowledge of EC among California women between 1999 and 2004. In the bivariate analysis, we examined trends in EC knowledge and determined whether differences by sociodemographic status have persisted over time. Race/ethnicity categories for the analyses include white, Hispanic, black/African American, North Asian (including Korean, Chinese, and Japanese), South/Southeast Asian (including Filipina, Vietnamese, Cambodian, Laotian, and East Indian), and other (including American Indian and Pacific Islander). Age is coded as a categorical variable (18–24, 25–34, or 35–44 years), as is education (less than high school, high school diploma, some college/technical school, college diploma). Poverty was defined by the federal poverty level (<100%, 100–200%, >200%). Variables measuring access to health care and need for contraception included family planning visit to physician in past year, health insurance (none, Medi-Cal, private insurance), and risk of unintended pregnancy. Women were considered to be at risk of unintended pregnancy if they reported being fertile, sexually active, and did not want to become pregnant. In the multivariate logistic regression analysis, we examined predictive factors of knowledge of EC, including sociodemographic characteristics, health insurance, and access to care for each year from 1999 to 2004. We restricted the multivariate analysis to women at risk of an unintended pregnancy because these are the women who are most likely to need EC.

## Results

Baseline data from the 1999 CWSHS survey indicated that slightly fewer than one half of California women (48%) reported that there was something a woman could do in the 3 days after unprotected intercourse to prevent pregnancy in response to the first EC question. By 2004, that proportion increased to nearly two thirds (65%;  $p < .05$ ).

Women who answered “yes” to the first EC question were asked the follow-up question, “What can she do?” A small percentage of women answering “yes” to the EC question in both 1999 (3%) and 2004 (4%) explicitly named “emergency contraception.” The majority of women referred to the “morning after pill” in their response (66% in 1999 and 65% in 2004) and others gave additional correct responses, such as have an IUD inserted, take high-dose/extra/several birth control pills, or take birth control pills. Incorrect responses, given by 18% of respondents to the second question in 1999 and 15% of respondents in 2004,

included answers such as RU-486, abortion, douche, injection, and herbal remedies. The percentage of women who gave a response in which they mentioned RU-486 fluctuated between 4% and 12% across the years. Although mifepristone, the ingredient in RU-486, can be used as emergency contraception it is available as abortion pills in the United States. Use of the term RU-486 likely indicates confusion of EC with medication abortion. The largest change over the time period was in the number of women who said that there was a pill, but they did not know the name: just over 2% in 1999, increasing to 14% in 2004.

Figure 1 shows the trends in the responses to these 2 EC questions. Based on the responses to the 2 EC questions, we created a composite variable of EC knowledge that describes awareness of a postcoital contraceptive method. Between 1999 and 2004, the percentage of all California women who could name a method of EC increased nearly 10 percentage points, from 39% to 48% ( $p < .05$ ). The percentage of women who were aware of a method to prevent pregnancy, but could not specifically name the method increased as well, from 1% in 1999 to 9% in 2004 ( $p < .05$ ; Figure 1). Taking the correct specific and imprecise responses together, an estimated 40% of women knew about EC in 1999 and 2000, after which this figure increased to 57% in 2004.

Although overall knowledge of EC improved between 1999 and 2004, the data demonstrate persistent disparities in knowledge of EC by selected demographic and socioeconomic variables (Table 1). In 1999, younger women (<25) were more likely to know about EC than older women. Between 1999 and 2004, the percent of women <25 who were aware of EC increased by 51%, from 45% to 68% ( $p < .05$ ), whereas the percent increased by 44% among women 25–34, and by 36% among women >35.

Racial/ethnic disparities in knowledge of EC persist. Despite the fact that the level of EC knowledge nearly doubled among Hispanic and South/Southeast Asian women between 1999 and 2004, the overall percentage of these women that have knowledge of EC remains 15–25 percentage points lower than their white, African-American, and North Asian counterparts ( $p < .05$ ). In addition, significant differences in EC knowledge between native and foreign-born Hispanic women are apparent. Between 1999 and 2004, foreign-born Hispanic women were half as likely to have heard of EC as native born Hispanic women ( $p < .05$ ), although the gap narrowed somewhat during this time period.

Between 1999 and 2004, the percentage of women with less than a high school diploma who were aware of EC more than doubled; however, in 2004, these women still exhibited low levels of EC knowledge (29%). Women with a college diploma remain significantly more likely to have heard of EC than women

**Table 1.** Percentage of California Women Who Know a Method of Emergency Contraception, by Selected Sociodemographic and Insurance Status Characteristics, California Women's Health Survey, 1999–2004

	1999	2000	2001	2002	2003	2004	Percent change, 1999–2004
Total	40	40	46	51	55	57	+41*
Race/ethnicity and nativity							
White	57	54	59	65	68	72	+26*
Hispanic	21	22	27	30	38	41	+95*
Native born	41	41	47	51	61	66	+61*
Foreign born	12	12	15	18	26	29	+142*
African American	41	44	51	53	57	61	+49*
North Asian	59	52	69	56	59	67	+14
S/SE Asian	27	25	46	43	50	47	+74
Other	32	45	37	53	55	56	+75*
Age (yrs)							
18–24	45	52	58	66	68	68	+51*
25–34	38	34	40	41	48	52	+44*
35–44	40	39	46	51	56	58	+36*
Education							
Less than HS	12	13	19	18	23	29	+142*
HS diploma	33	33	41	41	48	48	+45*
Some college/tech school	49	49	53	59	58	65	+33*
College diploma	61	57	57	64	69	72	+18*
Poverty level							
<100%	19	19	26	25	33	40	+111*
100–200%	34	33	39	47	45	46	+35*
>200%	54	52	54	60	63	65	+20*
Health insurance status							
None	29	26	33	36	46	50	+72*
Medi-Cal	27	32	32	33	41	43	+27*
Private	47	46	53	59	61	63	+59*
Recent doctors visit to discuss family planning							
No visit in past year	38	35	40	44	50	52	+37*
Visit in past year	45	48	53	60	60	64	+42*
Unintended pregnancy risk							
All at risk	42	44	50	56	58	59	+40*
Contracepting	47	46	53	58	63	63	+34*
Not contracepting	24	33	47	46	49	43	+79*
N	2,121	2,037	2,040	1,965	1,910	1,925	

\*Difference between 1999 and 2004 is significant at a .05 level.

with a high school diploma (72% vs 48%;  $p < .05$ ). The percentage of women with incomes below the federal poverty level who knew about EC doubled between 1999 and 2004 (19% to 40%;  $p < .05$ ). However, these women still have one of the lowest levels of EC knowledge among all groups studied.

Insured women remain more likely than uninsured women and women with public health insurance (Medi-Cal) to be aware of EC (63% vs 50%, 43%;  $p < .05$ ), although the gap in knowledge is smaller than it was in 1999. Women who have visited a family planning provider in the last year remain more likely to be aware of EC than women who have not had a visit in the last year (64% vs 52%;  $p < .05$ ). The difference in knowledge between women who have seen a family planning provider and those who have not has narrowed over the time period studied.

Women at risk for unintended pregnancy represent potential users of EC. In 2004, 59% of women at risk of pregnancy were aware of EC. Over the past 6 years,

women who are at risk of unintended pregnancy but not using contraception remain significantly less aware of EC than those who are at risk, but are using contraception. However, women who are at risk of pregnancy and not using contraception have increased awareness of EC nearly 80%, from 24% in 1999 to 43% in 2004 ( $p < .05$ ).

A multivariate logistic regression analysis identifies cofactors predicting knowledge of EC between 1999 and 2004 among 5,906 women at risk of unintended pregnancy (Table 2). Race/ethnicity consistently predicts EC knowledge, with South/Southeast Asian and foreign-born Hispanic women demonstrating significantly reduced odds of EC knowledge throughout the 6-year span of the survey. In 2004, foreign-born Hispanic women and South/Southeast Asian women were one quarter as likely as their white counterparts to be aware of EC (odds ratio [OR] = 0.28 and 0.27, respectively). Native-born Hispanic and African-American women demonstrate a different trend. By 2004, these women were statistically indistinguishable

**Table 2.** Logistic Regression Predicting Knowledge of Emergency Contraception Among California Women at Risk of Unintended Pregnancy by Year, 1999–2004

	1999	2000	2001	2002	2003	2004
Race/ethnicity and nativity						
White, non-Hispanic	Reference					
Native-born Hispanic	0.68	0.84	0.55*	0.60*	1.04	1.09
Foreign-born Hispanic	0.15*	0.27*	0.20*	0.21*	0.35*	0.28*
African American	0.56*	0.68	1.21	0.60	0.83	1.34
North Asian	0.88	1.17	1.89	0.77	0.67	0.67
South/Southeast Asian	0.20*	0.19*	0.59	0.38*	0.51*	0.27*
Other race/ethnicity	0.29*	1.86	0.65	0.50*	1.04	0.65
Age (yrs)						
18 to 24	2.13*	3.83*	3.40*	4.11*	3.48*	3.39*
25 to 34	1.67*	1.45*	1.33	1.74*	1.02	1.63*
35 to 44	Reference					
Health insurance						
No health insurance	1.17	1.32	1.17	1.47	0.81	1.23
Medi-Cal	0.53*	1.34	0.85	0.76	0.69	0.79
Private health insurance	Reference					
Federal poverty level						
<100%	0.70	0.47*	0.69	0.51*	0.65	0.87
100–200%	1.16	0.77	0.79	0.72	0.99	0.70
>200%	Reference					
Education						
Less than high school	0.18*	0.25*	0.31*	0.25*	0.29*	0.43*
High school diploma	0.36*	0.39*	0.61*	0.46*	0.52*	0.46*
Technical school/some college	0.67*	0.71	0.82	0.84	0.58*	0.75
College degree	Reference					
Recent doctor's visit to discuss family planning						
No visit in the past year	Reference					
Visit in the past year	1.06	1.47*	1.44*	1.58*	1.29*	1.56*
N	1092	1023	947	991	895	958

\*Significant at  $p < .05$ .

from white women in their level of knowledge about EC.

Levels of EC knowledge based on women's age showed persistent differences between younger and older women. Women in the youngest age category (18–24) were 2 to 3 times more likely to know about EC than women age 35–44.

Although lower levels of educational attainment continue to place women at decreased odds of EC knowledge, gaps in knowledge of EC based on a women's education status narrowed slightly between 1999 and 2004. In 1999, women without a high school diploma and women with a high school education were much less likely than women with a college diploma to have knowledge of EC (OR = 0.18 and 0.36, respectively). By 2004, differences between the 2 lowest education groups had narrowed, but both were still approximately half as likely to know about EC as women with a college degree.

Poverty and health insurance, 2 additional measures of socioeconomic status, did not consistently predict EC knowledge once we controlled for education, age, and race/ethnicity. Women who had a recent visit to a health care provider to discuss or receive family planning services were more likely to be aware of EC than women who had not had a visit

in the past year. The odds of EC knowledge in this group increased over time, from 1.06 in 1999 to 1.56 in 2004.

## Discussion

Between 1999 and 2004, knowledge of EC increased among women of reproductive age (18–44) in California, an increase that is likely related to the wide array of EC access and awareness campaigns that took place in the state during this time period. However, disparities in EC knowledge persist. Foreign-born Latina women, South/Southeast Asian women, and low-education women all exhibited significantly lower levels of knowledge than other women throughout the 6 year span of this population-based survey, despite significant increases in knowledge across all groups. For example, the odds of being aware of EC increased significantly for native-born Hispanic women between 1999 and 2004, but increased only slightly for foreign born Hispanic women. Given that these women may have limited health care access and fewer resources to manage an unplanned pregnancy, it is essential that EC campaigns in California and across

the country reach out to women who face barriers to receiving health care information and services.

Although this study demonstrates that older women are not as informed about EC as they might be, it is encouraging that younger women demonstrated tremendous gains in EC knowledge in recent years. Nationally, rates of unintended pregnancy are high among young women, particularly those under age 24 (Finer & Henshaw, 2006). Emergency contraception may be an important component of efforts to lower unintended pregnancy rates among young women; recent research in California has shown that when teenagers have increased access to EC, they are more likely to use it than older women are (Harper, Cheong, Rocca, Darney, & Raine, 2005).

An important source of information about EC for women in California may be their health care provider, suggested by the finding that women who have had a recent family planning experienced larger gains in EC knowledge between 1999 and 2004 than those who had no visit in the past year. Family PACT, the California family planning program for uninsured low-income Californians, currently serves >1.5 million women and men per year. The Family PACT program began covering EC in 1999, suggesting that low-income women in California may have greater access to EC through their health care providers than women in other states. Continuing provider education may increase the overall awareness and use of EC.

This study has 2 limitations. First, our study uses 2 simple questions to identify women who have knowledge of EC. Without the ability to do additional probing, we must make some assumptions about imprecise responses, such as “seek medical attention,” and “take pill, don’t know name.” We have chosen to assume that such responses indicate sufficient knowledge of EC to enable a woman to get EC if she was in need. However, this treatment of imprecise responses may overestimate the extent of knowledge about EC. Second, women were more likely to refuse to answer the EC questions in 2003 and 2004 than in previous years (10%, compared with <1%). We cannot explain this change in terms of the location of the EC questions in the survey or survey protocol. We do not see an abrupt change in levels or predictors of knowledge of EC between 2002 and 2003 that might indicate that those who refuse are inherently different from those who provided answers to the question.

The need to increase knowledge of EC has become more pronounced since August 2006, when the Food and Drug Administration approved an application to sell EC over the counter for women age  $\geq 18$ . However, for women to make use of the opportunity to get EC without a prescription, they need to know about its availability, rather than rely solely on health care providers to educate them about this method. They also need to have access to pharmacy workers who are

both willing and trained to dispense information regarding EC, an issue that may be more challenging in rural or conservative communities. With EC available behind the counter, adults in the rest of the country will experience a mode of dispensing EC that is close to California’s current system of pharmacy access.

California’s proactive role in making EC available to women through pharmacy access and through the state family planning program, as well as its strong advocacy and education groups, have probably given California women better access to information about EC than women in other states. The success of California in educating women may be a model for public health programs in other states, but it also provides the lesson that even concentrated efforts to promote information about EC may not reach all women in need. To ensure that low-income, marginalized women gain greater access to information regarding the availability of EC, a variety of community-based strategies need to be actively pursued. Special educational outreach, for example, through the culturally specific efforts of *promotoras* and other community health workers, tailored multimedia educational campaigns, and the active engagement and education of pharmacists, are all needed to eliminate existing health disparities.

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