



Published in final edited form as:

Contraception. 2013 February ; 87(2): 143–148. doi:10.1016/j.contraception.2012.06.009.

Extending contraceptive coverage under the Affordable Care Act saves public funds

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Abstract

Background—The Affordable Care Act (ACA) will expand health care coverage to low-income Americans. Contraception services are a mandated component of ACA plans.

Study Design—A decision-analytic model was developed to compare the costs and outcomes of the current versus the proposed plan for contraceptive coverage (Federal Poverty Level=185% vs. 399%, respectively) over 5 years. The perspective adopted was that of Oregon state insurance providers. The primary outcomes were number of pregnancies averted, health costs and quality adjusted life years (QALYs). Contraceptive failure rates, costs, projected insurance coverage, contraception use and pregnancy outcome data were obtained from the published literature. Sensitivity analyses were performed for all variables.

Results—Extending contraceptive coverage both saves money and improves outcomes for Oregon state insurance plan providers. The proposed policy would prevent an additional 72 pregnancies per 1000 women over 5 years. Extending coverage is cost-effective, saving an additional \$489 per woman enrolled over 5 years while increasing QALYs.

Conclusions—Expanding contraceptive coverage under the Affordable Health Act is cost-effective for Oregon state insurance providers. © 2013 Elsevier Inc. All rights reserved.

Keywords

Cost-effectiveness; Contraception; Affordable Care Act; Decision analysis

1. Introduction

Unintended pregnancies are endemic in the United States, with nearly half of all pregnancies being unintended [1]. The personal, social and economic costs associated with unintended pregnancies are considerable [2–4]. Direct medical costs of unintended pregnancies in the

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[★]Funding: This work was supported in part by the Eunice Kennedy Shriver National Institute of Child Health and Human Development grant for Infrastructure for Population Research at Princeton University (Grant R24HD047879; J.T.).

United States are estimated to cost over 5 billion dollars annually [2]. Such direct costs do not include the downstream impact of unintended pregnancies on the overall productivity of either the women with unintended pregnancies or their children. Children of unintended pregnancies are known to have worse health and long-term outcomes than children from planned pregnancies [5].

Contraception is an essential strategy to prevent unintended pregnancies, and is a cost-effective and cost-saving use of public funds [2,6–9]. The US Affordable Care Act (ACA), which among other provisions expands access to health care for the currently uninsured population between 139% and 399% of the Federal Poverty Level (FPL), creates an opportunity to encourage cost-savings through the provision of contraceptive coverage. Expansion of health care coverage by the ACA will be instituted through state-based insurance exchange plans (American Health Benefit Exchange plans). All types of insurance providers (private insurers as well as state-run and state-subsidized insurers) will be governed by the ACA. Public funds will be used to subsidize coverage for individuals and families with incomes up to 399% FPL who have no other option for insurance [10]. These subsidies will be offered on a sliding scale basis and will limit the cost of the premium to between 2% and 9.5% of income for eligible individuals [10]. The insurance exchange plans have several required elements, including many preventative health services. Contraception is stipulated as a mandatory health service under the exchange plans, at no additional cost to women [11].

Under current Medicaid statutory requirements that remain unchanged by the ACA, residents qualifying for Medicaid receive contraceptive services without cost-sharing. Twenty-nine states, including Oregon, have created Medicaid extension waiver programs to extend coverage for contraceptives beyond the baseline income cutoff for Medicaid [12]. Currently, residents in Oregon with incomes up to 185% FPL are eligible for contraceptive services, and this program has been shown to be cost-effective [12,13]. However, this income cutoff still leaves a significant unmet need for access to contraception, despite other policies in Oregon such as contraceptive equity laws requiring private insurance companies to cover contraceptive services [14,15]. This study models the cost-effectiveness of expanding contraceptive coverage from 185% to 399% FPL for insurance exchange plan providers in Oregon, as it examines the impact of expanded coverage of currently uninsured women in Oregon.

2. Materials and methods

A decision-analytic model was created using TreeAge Pro 2009 software (TreeAge Software, Williamstown, MA, USA) to evaluate the impact of expanding coverage for contraception (Fig. 1). Decision analysis allows the step-by-step comparison of alternate strategies. Our model compared the probability of unintended pregnancy and associated costs in two scenarios: current contraceptive coverage in Oregon and expanded access under the ACA. The primary outcome of the model was unintended pregnancies averted. We also considered direct health care costs and quality adjusted life years (QALYs). Outcomes were evaluated over 5 years, and the Markov cycle length within the model was 1 year. The

research protocol was deemed exempt from review by the institutional review board at Oregon Health & Science University.

The model tracked a hypothetical woman in Oregon of reproductive age (18–44 years old) through the process of accessing contraception in a publicly funded family planning clinic, considering the probability of meeting income eligibility criteria, use or nonuse of contraception, and subsequent pregnancy outcomes. Currently, in Oregon, an estimated 141,320 women of reproductive age access contraceptive services annually through publicly funded family planning clinics [7]. Estimates of the ACA's impact vary. Oregon has contraceptive equity laws requiring private insurance companies to cover contraceptive services [15]. The population who will benefit from extended contraceptive coverage under the ACA is made up of individuals between 185% to 399% of the FPL without health insurance.

We estimated this population using data from the American Community Survey, an annual survey from the US Census Bureau [14]. This survey reports that, in Oregon, 25% of individuals between 200% and 399% FPL are currently uninsured. To provide a conservative estimate of the population affected, we restricted this number to age 18–44 and female gender. This resulted in an estimated 53,230 women, currently uninsured, who would become eligible for contraceptive coverage under the ACA. This represents a 12% increase in coverage eligibility (Table 1).

Contraceptive options, as per available options in Oregon's family planning clinics, included depot medroxyprogesterone acetate (DMPA), intrauterine contraceptives [copper intrauterine device (IUD) and levonorgestrel intrauterine system], implants, female surgical sterilization, combination hormonal contraceptives [oral contraceptive pills (COCs), the vaginal ring and the transdermal patch], condoms and natural family planning (NFP). Use rates by contraceptive types were assumed to be equal among income categories.

Use and nonuse of contraception in each insurance eligibility category were calculated based on prior studies examining use and nonuse of contraception of various eligibility and income categories, as per Table 1. We assumed that uninsured women would be less likely to use contraception (22% reduction in use compared to the baseline population) and be 18% less likely to use long-acting contraception [18,22]. Use rates by contraceptive types were assumed to be equal among income categories. As the majority of women using combination hormonal contraceptives use COCs, the vaginal ring, contraceptive patch and COCs were grouped together. Efficacy rates are similar for all combined hormonal methods [16]. Due to small rates of use and similar efficacy rates, condoms users and NFP were combined into a single category [16].

Probability estimates for contraceptive efficacy and pregnancy outcomes were derived from the literature (Table 1) [16,19–21]. Pregnancy outcomes were assigned based on unintended pregnancy results for the state [19]. Pregnancy rates and outcomes were assumed to remain proportionally stable from 2006 to 2011.

Costs were considered for contraceptive provision, as well as for all pregnancy outcomes (Table 2). Costs of contraceptive provision, including a physician visit, were based on state

data [6,25]. Delivery costs were based on state-reported hospital costs for uncomplicated deliveries [23]. Spontaneous abortion and ectopic costs were based on Diagnosis Related Group (DRG) codes as per previous studies evaluating the cost-effectiveness of contraception [6]. Induced abortion costs were obtained from a prior study evaluating the incidence and access to abortion services in the United States [24]. The health care component of the consumer price index calculator was used to convert all costs to 2011 dollars. All costs were discounted at a standard rate of 3% annually. Previous research has estimated that only 40% of unintended births are truly unwanted, while the remainder are mistimed [26]. We assumed that 40% of births averted were mistimed and would occur on average 4 years later [27]. Costs of an unintended birth were reduced accordingly [27].

QALYs, the product of both life expectancy and utility, were analyzed in the model to estimate the impact of an unintended pregnancy on a women's quality of life. Utility, a measure of satisfaction or value for a particular health state, was defined in this case as avoiding an unintended pregnancy. QALYs were calculated for 5 years following the pregnancy and discounted at a standard 3% annually. Health utility for unintended pregnancy in our model (for which 0 represents death and 1 represents perfect health) was set at 0.992 based on a time trade-off metric reported in the literature [4].

The robustness of the model was evaluated with both univariate and multivariate sensitivity analyses, allowing us to estimate how changes in parameters could affect results. The range of variation for each variable was 50%–200% of the baseline estimate. We performed a Monte Carlo simulation using 10,000 trials to evaluate how simultaneous multivariable changes could affect outcomes. The Monte Carlo simulation enabled variation of all probability estimates simultaneously by sampling distributions around the baseline estimate.

3. Results

Extending contraceptive coverage to 399% FPL would prevent unintended pregnancies, while saving public insurers' money and improving quality of life. Expansion of contraceptive services from 185% to 399% FPL over the course of 5 years would result in preventing an additional 72 unintended pregnancies per 1000 women newly eligible for care (Table 3). This equates to 3890 unplanned pregnancies among reproductive-aged women in Oregon, currently uninsured, who are between 185% and 399% FPL [14]. Over 5 years, increasing coverage would save state insurers \$489 per woman enrolled and improve overall quality of life for these women. In the same cohort of reproductive-aged women in Oregon, currently uninsured, this translates to an estimated cost savings of \$26 million dollars over 5 years and an increase of 2288 QALYs in this population [14].

Sensitivity analysis of all model parameters demonstrated that our model was robust. Regardless of contraceptive methods selected, increased provision of contraception cost less and was more effective. These results persist regardless of the percentage of uninsured women in the state between 185% and 399% FPL. We examined the sensitivity of results to the probability that uninsured women may pay for contraception out of pocket. Increasing contraceptive coverage is cost-saving unless 100% of uninsured women self-pay for contraception. We then examined the sensitivity of the results to the probability that women

not using contraception would conceive. As long as 10% of these women conceived over a year, increasing contraception provision is cost-effective. We then examined how sensitive the results are to the probability that women eligible for care would elect to use contraception. Increased contraceptive use led to further decreased costs (Fig. 2). Increasing coverage to 399% FPL dominates across all probabilities of contraceptive uptake, even when ranging the contraceptive efficacy of each method from less than half of accepted efficacy rates, to known efficacy [16]. An important consideration in our model is payer costs for induced abortion. States vary in whether they use state Medicaid funds to cover induced abortion care. We ranged payer costs for induced abortion from 0 to \$10,000 to account for even the most extreme scenario of a hospital abortion leading to complications. Even if the payer does not cover abortion costs, increasing contraceptive services to 399% FPL remains dominant. All costs were ranged to exaggeratedly low and high levels for the purpose of sensitivity analysis.

Monte Carlo simulation of 10,000 trials was performed to further assess the robustness of the model. In 88.6% of trials, increasing contraceptive coverage to 399% FPL reduced unintended pregnancies, saved funds and improved QALYs.

4. Discussion

Expanding access to contraceptive services by increasing the income eligibility from 185% to 399% FPL would reduce unintended pregnancies, save public funds and improve quality of life. The ACA presents states the opportunity to improve their budgets and the health of their residents by improving access to reproductive health care.

Our model presents a conservative estimate of the impact for the state of Oregon of expanding coverage to contraceptive services to 399% FPL. Estimates of the population that will benefit from the ACA vary, with the Kaiser Family Foundation projecting a 20%–25% increase in coverage for Oregon citizens [28]. We relied on US Census data for our estimate and projected a more conservative 12% increase in coverage.

To avoid overestimating savings, the model considers only the direct costs of medical care. Additionally, pregnancy costs were defined conservatively in the model based on uncomplicated outcomes. The costs of unintended births were restricted to 5 years and were discounted based on 40% of births being mistimed and occurring 4 years later. Limiting the time horizon to 5 years underestimated the benefits of longer-acting contraception such as the copper IUD and sterilization. This model is conservative in not including the lifelong, downstream impact on women with unintended pregnancies and their offspring. The model addressed the population in Oregon who could qualify for American Health Benefit Exchange plans under the ACA, but did not address the cost-effectiveness of providing contraception to undocumented immigrants in Oregon's population. Excluding undocumented immigrants from our model could potentially underestimate cost-savings. Undocumented immigrants are eligible for obstetrical coverage but not contraception by federal law — another opportunity for health care cost savings [25].

Our model was designed utilizing specific data from Oregon, and we derived an estimated cost-savings of \$26 million over 5 years. While some of our assumptions were specific to Oregon, a crude estimate of the impact of expanding contraceptive coverage to 399% FPL nationally can be done. Considering the number of reproductive-aged women nationally, currently uninsured and between 185% and 399% FPL, estimated as 6,074,529, expansion could lead to nearly \$3 billion in savings over 5 years [14]. With the economic pressures facing our nation and particularly the health sector of the economy, such potential savings should not be ignored.

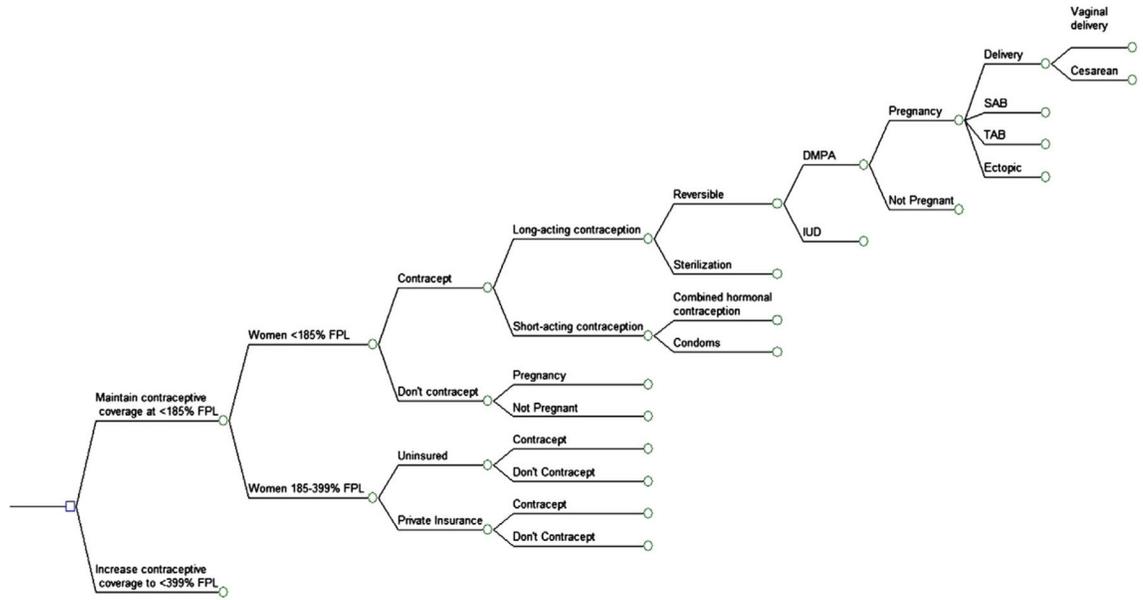
As with all economic models, our analysis has limitations. Uncertainty among key parameters such as differences in contraceptive use between populations, numbers eligible for coverage and variations in pregnancy intention also limited our findings. Sensitivity analysis demonstrated that regardless of variation in model inputs, extending contraceptive coverage is cost-effective for the state.

Modeling is a useful tool for estimating policy outcomes that cannot be otherwise evaluated. The ACA represents a restructuring of our health care system and a critical opportunity to improve public health through evidence-based policy. Reproductive health care has significant and long-lasting benefits for not only the individual but her family and community [5]. This model provides useful insight into the expected monetary, social and quality of life measures of extending publicly funded contraceptive coverage. Sensitivity analysis demonstrated that despite uncertainty in population measures, our conclusion remained the same: increasing eligibility for contraceptive coverage saves public funds by reducing unintended pregnancy. As Oregon and all states work through the details of implementing their American Health Benefit Exchange plans, this study emphasizes the importance of including contraceptive coverage.

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All branches lead to same outcomes, truncated here for clarity.

Fig. 1. Markov model comparing pregnancies, costs and QALYs with two alternate contraceptive coverage strategies.

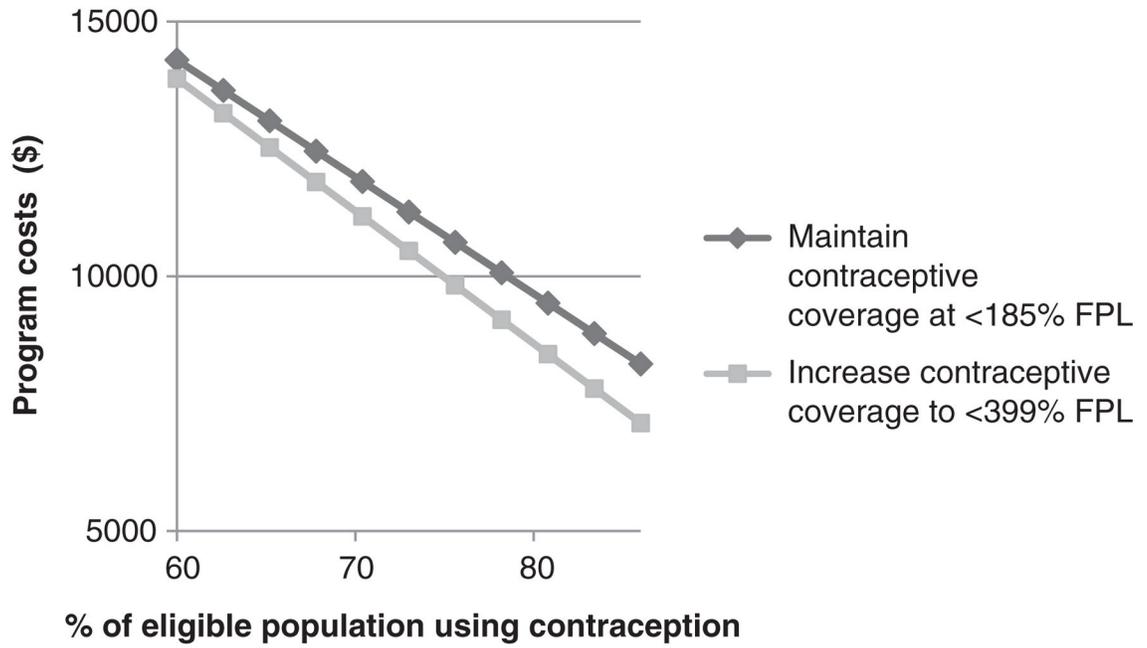


Fig. 2.
Sensitivity analysis: program costs decrease with increased contraceptive use.

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Table 1

Probability estimates

Variable	Baseline	Reference
Method	Efficacy (%)	
IUD	99	[16]
Sterilization	99 ^a	[16]
Combined hormonal	92	[16]
DMPA	97	[16]
Condoms/NFP	85 ^b	[16]
No method	80	[16]
Demographics	(<i>n</i>)	[14]
Women in Oregon (ages 18–44)	693,391	
< 185% FPL	239,778	
185%–399% FPL	209,869	
• Private insurance	156,639	
• Uninsured	53,230	
Contraception use by insurance status	Probability (%)	
Contraceptive use when insured	62 ^c	[17]
Contraceptive use when uninsured	40 ^d	[17,18]
Pregnancy outcome	Probability (%)	
Delivery	53	[19]
Cesarean	29 ^e	[20]
Vaginal	71 ^e	[20]
Spontaneous abortion	11 ^f	[19]
Induced abortion	35	[19]
Ectopic	1	[21]
Type of contraception	Use rate (%)	
Long-acting	46	[17]
Reversible	19 ^e	[17]
IUD	63 ^e	[17]
DMPA	37 ^e	[17]
Permanent	81 ^e	[17]
Short-acting	54	[17]
Combined hormonal	59 ^e	[17]
Condoms/NFP	41 ^e	[17]

^aRate varies depending on method of sterilization; rate used for female sterilization.

^bBased on the male condom (0.85).

^cBased on National Survey of Family Growth data of current use in system of contraception coverage < 185% FPL.

^dBased on 22% reduction of use from baseline population if no insurance.

^eSubcategory of a variable; all variables within a subcategory have a sum of baseline values=100%.

^fSpontaneous abortion rate reduced from 12% to 11% based on lack of ectopic reporting in Ref. 19.

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Table 2

Costs and utilities for contraceptives and pregnancy outcomes in OR

Contraceptive/outcome/utility	Utility or cost per event or per year, in 2011 \$	Reference
Vaginal delivery	6101 ^{a,b}	[23]
Cesarean delivery	11,028 ^{a,b}	[23]
Induced abortion	628 ^c	[24]
Spontaneous abortion	620 ^d	[6]
Ectopic pregnancy	12,261 ^e	[6]
Sterilization	1408 ^f	[25]
Clinic visit	149	[25]
DMPA	37 ^f	[25]
Combined hormonal	105 ^{f,h}	[25]
IUD	251 ^f	[25]
Condoms	45 ^{f,g}	[6,25]
Newborn to age 5	6048 ⁱ	[25]
Unintended pregnancy health utility	0.992	[4]

^aPayments are based on average payments for “minor” deliveries in Oregon and do not include Medicare/Medicaid claims nor charges for professional fees that are billed separately (such as anesthesiology).

^bThese are the costs of delivery of an unwanted birth. The costs used in the model are the costs of deliveries that are unintended, which are 46.7% of the costs shown here: \$2849 (vaginal delivery) and \$5150 (cesarean delivery). For an explanation, see the text.

^cThe mean charge for 10-week nonhospital therapeutic abortion in 2006.

^dPrice per spontaneous abortion (SAB) based on DRG codes 380 and 381, with 95% in-hospital abortions; SABs of all gestational ages assumed to have same cost.

^eBased on Healthcare Cost and Utilization Project nationwide inpatient sample data and Medical Expenditure Panel Survey.

^fContraceptive cost input into the model included the price of each method (2009 \$ inflated to 2011 \$) plus a one-time clinic visit.

^gCondom costs assumed 80 acts of intercourse per year.

^hThe vaginal ring and transdermal patch were conservatively assumed to be the cost of the OCP.

ⁱEstimate of societal cost of public programs a child is eligible for until age 5 (including newborn medical care). The cost used in the model (\$6048) is the cost of a newborn to age 5 discounted by 46.7% due to the rate of deliveries that are mistimed vs. unintended. See text for explanation.

Table 3

Cost-effectiveness results

	Maintain coverage at < 185% FPL	Increase coverage to < 399% FPL	Difference
Cost	\$13,328	\$12,839	\$489
Number of pregnancies	1.867	1.795	0.072
QALY	3.483	3.440	0.043

Cost, QALY and number of pregnancies are reported per person over 5 years.

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