Cost-Effectiveness (CEA) of Etonogestrel Subdermal Implant in a Brazilian Private Health Insurance

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INTRODUCTION

Contraceptive choices play a crucial role in reproductive health, with varying implications for both individual well-being and healthcare systems. In Brazil, where the impact of unintended pregnancies remains a significant public health issue, it is essential to evaluate the cost-effectiveness of available contraceptive methods to inform public policies and healthcare resource allocation.

OBJECTIVE

To evaluate the cost-effectiveness of the etonogestrel implant (EI) compared to monthly and quarterly injectables, copper intrauterine device (IUD), combined oral contraceptive, and the progestin-only pill from the perspective of the Brazilian health system.

METHODS

A Markov model was developed to simulate the trajectories of 1,000 women of reproductive age over three years for each method. The model included stages of discontinuation, method switching, unintended pregnancies (including abortions, vaginal deliveries, and cesarean sections), and their associated costs. Variables such as age distribuition, fertility rates, pregnancy outcomes, market share, efficacy, discontinuation, and medical costs related to contraceptive methods and pregnancies were obtained from national public databases (CMED, IBGE, PNS, SIGTAP, SIM, and SISNAC) and published literature. Costs and benefits were discounted at 5%, and a probabilistic sensitivity analysis (PSA) was conducted to assess result robustness.

RESULTS

EI was the most effective method, preventing 47.44% to 83.33% more unintended pregnancies compared to other methods. In terms of total costs, EI was less expensive than the IUD and the monthly injectable, with a reduction of 20.45% and 16.36%, respectively, both of which were dominated due to being more expensive and less effective.

Table 1. Discounted Cost and Health Outcomes

Contraception Type	Total Cost	Total Pregnancy	QALYs
Etonogestrel implant	$387.103	41	-13,78
Quarterly intectable	$333.231	203	-69,55
Copper IUD	$486.603	78	-26,59
Combined pill	$376.627	244	-84,18
Progestin-only pill	$357.822	244	-83,79
Monthly injectable	$468.416	246	-84,73

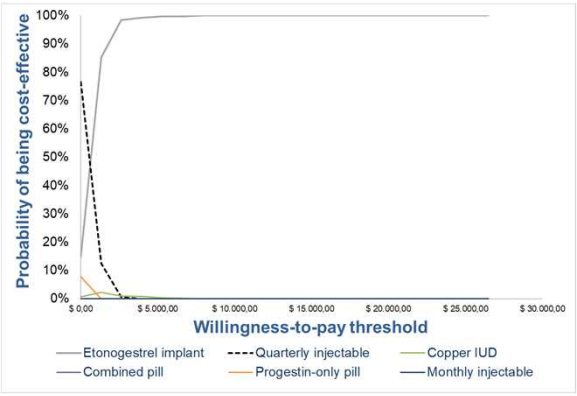
In comparison to the other methods, the incremental cost-effectiveness ratio (ICER) values for EI were $966/QALY (quarterly injectable), $149/QALY (combined oral contraceptive), and $418/QALY (progestin-only pill), all well below the cost-effectiveness threshold of $6,996/QALY based on Brazil's GDP per capita. PSA confirmed the robustness of these findings, with EI demonstrating effectiveness in 100% of simulations and a 99.8% probability of being cost-effective at a threshold of $6,622/QALY.

Table 2. Cost-Effectiveness Analysis

Contraception Type	ΔCost	ΔUtility	ICER
Etonogestrel implant	reference	reference	N/A
Quarterly intectable	-R$325.386,00	-55,8	R$ 5.834
Copper IUD	R$600.979,33	-12,8	Dominated
Combined pill	-R$63.279,15	-70,4	$899
Progestin-only pill	-R$176.858,80	-70,0	R$ 2.526
Monthly injectable	R$491.129,67	-71,0	Dominated

RESULTS

Figure 2. Cost-effectiveness acceptability curve



CONCLUSION

EI proved to be the most effective and cost-effective method among those evaluated, significantly reducing unintended pregnancies and associated costs. Notably, indirect and social costs related to unintended pregnancies were not considered, suggesting that the economic benefits of EI may be even greater than estimated.

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