Original Research

A Cost–Benefit Analysis of Low-Dose Aspirin Prophylaxis for the Prevention of Preeclampsia in the United States

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OBJECTIVE: To develop a decision model to evaluate the risks, benefits, and costs of different approaches to aspirin prophylaxis for the approximately 4 million pregnant women in the United States annually.

METHODS: We created a decision model to evaluate four approaches to aspirin prophylaxis in the United States: no prophylaxis, prophylaxis per American College of Obstetricians and Gynecologists (the College) recommendations, prophylaxis per U.S. Preventive Services Task Force recommendations, and universal prophylaxis. We included the costs associated with aspirin, preeclampsia, preterm birth, and potential aspirin-associated adverse effects. TreeAge Pro 2011 was used to perform the analysis.

RESULTS: The estimated rate of preeclampsia would be 4.18% without prophylaxis compared with 4.17% with the College approach in which 0.35% (n=14,000) of women receive aspirin, 3.83% with the U.S. Preventive Services Task Force approach in which 23.5% (n=940,800) receive aspirin, and 3.81% with universal prophylaxis. Compared with no prophylaxis, the U.S. Preventive Services Task Force approach would save $377.4 million in direct medical care costs annually, and universal prophylaxis would save $365 million assuming 4 million births each year. The U.S. Preventive Services Task Force approach is the most cost-beneficial in 79% of probabilistic simulations. Assuming a willingness to pay of $100,000 per neonatal quality-adjusted life-year gained, the universal approach is the most cost-effective in more than 99% of simulations.

CONCLUSION: Both the U.S. Preventive Services Task Force approach and universal prophylaxis would reduce morbidity, save lives, and lower health care costs in the United States to a much greater degree than the approach currently recommended by the College.

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Preeclampsia is responsible for a tremendous burden of maternal and perinatal morbidity and mortality.[1,2] At present, preeclampsia complicates between 3.1% and 7.2% of the births in the United States,[2,3] and one in seven preterm births and one in 10 maternal deaths in the United States can be directly attributed to preeclampsia and eclampsia.[4] Although there are well-established risk factors for preeclampsia (obesity, multiple gestation, advanced maternal age) and mitigating these risk factors would probably reduce the rate of preeclampsia and its subsequent morbidities, the only intervention that has been shown to reduce the risk of preeclampsia is low-dose aspirin. Multiple randomized controlled trials and meta-analyses have demonstrated that when pregnant women with various risk factors for preeclampsia take 60–150 mg of aspirin daily (or similar drugs such as dipyridamole), their overall risk of preeclampsia is reduced.[5–17] This benefit obtains for women with a wide variety of risk factors for preeclampsia.[5] Moreover, aspirin reduces the rate of preterm birth.[5–7,9,10]

Currently, the American College of Obstetricians and Gynecologists (the College) recommends low-dose aspirin only for a narrow segment of pregnant women: those with a history of preeclampsia necessitating delivery before 34 weeks of gestation and those with preeclampsia in more than one prior pregnancy.[18] The U.S. Preventive Services Task Force,

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after performing their own systematic review,[5] released much broader recommendations, encouraging all women at high risk for preeclampsia (eg, those with diabetes or chronic hypertension) and any woman with two or more moderate risk factors (eg, nulliparity, obesity) to take low-dose aspirin.[19] Given these divergent recommendations, we developed a decision model to evaluate the risks, benefits, and costs of different approaches to aspirin prophylaxis for pregnant women in the United States.

MATERIALS AND METHODS

We created a decision model to compare four approaches to aspirin prophylaxis and applied it to a hypothetical cohort of 4 million women giving birth annually in the United States (Appendix 1, available online at http://links.lww.com/AOG/A710). In the first approach, no women received aspirin. In the other three, varying proportions of women received 81 mg aspirin by mouth per day. In the College approach, only women with a history of preeclampsia necessitating delivery before 34 weeks of gestation or with preeclampsia in more than one prior pregnancy received aspirin.[18] In the U.S. Preventive Services Task Force approach, women with a history of preeclampsia and those with multiple gestation, chronic hypertension, diabetes mellitus, renal disease, or autoimmune disease received aspirin.[19] Additionally, women with two or more moderate risk factors such as nulliparity, obesity, African American race, age 35 years or older, a family history of preeclampsia, or a personal history of pregnancy complications (eg, a history of delivering a small-for-gestational-age neonate or an interpregnancy interval of more than 10 years) also received aspirin. In the fourth approach, all women received aspirin. We assumed women initiated aspirin after their first prenatal visit and continued it until delivery.

We assumed that aspirin reduced the rate of preeclampsia in women at moderate and high risk for preeclampsia.[5–17] In the baseline analysis, we assumed that moderate-risk women benefited only half as much as high-risk women to account for the uncertainty surrounding the magnitude of benefit for the less well-studied moderate risk factors, and to avoid biasing our model toward treatment. We assumed no benefit from aspirin for low-risk women.[8,10] Regardless of risk category, compliance with aspirin was assumed to be 77% (the same rate that was reported in a large population representative cohort of pregnant women in the United States for vitamin supplementation) but was varied from 0% to 100% in sensitivity analysis.[20] Model outputs included cases of preeclampsia, preterm birth, perinatal and maternal deaths, placental abruption, maternal gastrointestinal bleeding, exacerbated respiratory disease, incremental direct medical expenditures, and quality-adjusted life-years (QALYs) gained by the avoidance of perinatal death and prematurity.

We generated estimates for the model by performing a bibliographic search in PubMed using the MeSH terms preeclampsia and aspirin and limiting the study type to meta-analysis or systematic review (Table 1). Using these studies and their bibliographies, we identified the requisite risk factor prevalence and outcome data. When population-based estimates were not available from this original query, we searched the National Vital Statistics. For still missing point estimates, we performed individual PubMed searches to estimate the prevalence of particular risk factors, prioritizing recent U.S. prospective studies. Cost data were obtained from the Agency for Healthcare Research and Quality's Healthcare Cost and Utilization project[21] and from several large economic analyses of hospital costs for preterm birth, gastrointestinal bleeding, obstetric bleeding, and respiratory disease[22–25] (Table 2).

A woman's risk for preeclampsia and preterm birth depended on her risk category (Tables 2 and 3). Based on the best population prevalence rates available, we assumed 0.35% of pregnant women would receive aspirin under the College approach (Appendix 2, available online at http://links.lww.com/AOG/A711). The U.S. Preventive Services Task Force guidelines recommend that women with one or more high risk factors receive aspirin. Although the high risk factors independently sum to a prevalence of 7.9%, the factors overlap. Thus, conditional probabilities were used to calculate the percentage of women with one or more of the high risk factors (7.2%; Appendix 2, http://links.lww.com/AOG/A711). Because there are no population data on this composite variable, in sensitivity analysis we allowed the percentage of high-risk women in the population to range from 3% to 20%. Women defined as at risk by the College or high risk by the U.S. Preventive Services Task Force were assumed to have a 19.4% risk of developing preeclampsia[6,9,11]; in sensitivity analysis, this risk was varied from 12%, consistent with the risk for multiple gestations, to 26%, the risk for women with chronic hypertension.[11] Women deemed at risk by the College or high risk by the U.S. Preventive Services Task Force were also assumed to have a 40% (range 18–43%) risk of delivering preterm (before 37 weeks of gestation).[5,6,9,11,26]

The U.S. Preventive Services Task Force approach also recommends low-dose aspirin for women with two or more moderate risk factors (Table 3). If these factors were independent of one

another, an additional 27.6% of women would be eligible for prophylaxis with aspirin (Appendix 3, available online at http://links.lww.com/AOG/A712). However, it is unlikely that these factors are completely independent, nor are they likely entirely independent of high risk factors. Thus, we assumed all high-risk women also had two or more moderate risk factors, leaving 20.4% of the population with two or more moderate risk factors but no high risk factors. In sensitivity analyses we allowed this estimate to vary widely (10–50%). Women in this group had a 6.2% (range 4.1–8.3%) risk of developing preeclampsia[9,27] and a 16.1% (range 8–24.2%) risk of preterm delivery for any reason.[9,11,27] We further assumed in the baseline analysis that only 80% of women with moderate risk factors would be ascertained and receive aspirin, but in a sensitivity analysis we allowed this estimate to vary to as low as 50%, consistent with the failure-to-screen rate seen when risk-based gestational diabetes mellitus screening is used.[28]

Low-risk women were assumed to have a 2.1% risk of preeclampsia.[27] In our sensitivity analysis, this number was allowed to range from 1.5% to 6.7%.[3,6] Because we could not find a population-based estimate for the risk of preterm birth in women at low risk for preeclampsia, we set the preterm birth rate to 7.5% to ensure that our modeled cohort had an overall preterm birth rate consistent with the U.S. population.[29] In the sensitivity analysis, we allowed this estimate to range from 3.3% to 10.7%.[30,31]

Perinatal death (fetal plus neonatal) rates were estimated based on the underlying maternal risk factors. The principal data on fetal and neonatal death rates were obtained from the National Vital Statistics[32] and adjusted using data that evaluated the risk of perinatal death in women with known risk factors for preeclampsia.[3,9] We assumed low-, moderate-, and high-risk pregnancies had an associated 0.54% (0.1–1.2%), 2.49% (0.54–5.3%), and 5.67% (1.08–7.2%) risk of perinatal death.

None of the individual trials or meta-analyses was sufficiently large to adequately assess maternal death. In the United States, the maternal death rate is 16 per 100,000.[33] In absence of directly informative data, we assumed that to the degree aspirin reduced preeclampsia, it would reduce the rate of preeclampsia-associated maternal death (1.5/100,000).[4]

We used data from five meta-analyses to estimate the risk reduction that aspirin would confer. In our baseline analysis, we used the point estimates from the most recent published meta-analysis.[5] In sensitivity analyses, we allowed the relative risks to vary to the most extreme 95% confidence bounds from the five meta-analyses (Table 1).[5–7,9,10] Although none of the meta-analyses found statistically significant detrimental effects from aspirin, to account for the possibility of rare adverse effects from aspirin, we assumed aspirin increased the risk of gastrointestinal bleeding and aspirin-exacerbated respiratory disease. This latter condition occurs in approximately 7.2% (range 5.3–9%) of the 6.7% (range 5.5–8.7%) of women who have underlying asthma or asthma-like symptoms.[34,35]

The cost of aspirin was based on the current consumer price in the United States for the course of the pregnancy (base case $5, range $1–20).[36] To estimate the direct excess medical costs associated with preeclampsia, we used primary Agency for Healthcare Research & Quality data, subtracting the mean costs associated with a delivery complicated by preeclampsia ($7,428) from the mean costs associated with a delivery not complicated by preeclampsia ($4,020) to arrive at our baseline estimate of $3,408.[21] The direct excess medical cost of a preterm birth ($19,285) was based on a large study that was part of the Healthcare Cost and Utilization Project that included all births at less than 37 weeks of gestation.[22] In sensitivity analysis we allowed both of these cost estimates to vary by 50%. We also included cost estimates for placental abruption, gastrointestinal bleeding, and aspirin-exacerbated respiratory disease

Table 1. Meta-analysis Outcome Data

Author, Year	No. of Trials Included	No. of Women Included	RR With Aspirin Use (95% CI)
			Preeclampsia
Askie et al,[6] 2007	36	34,288	0.9 (0.84–0.97)
Bujold et al,[7] 2010	34	11,348	0.47* (0.34–0.65); 0.81† (0.63–1.03)
Duley et al,[9] 2007	39	37,560	0.83 (0.77–0.89)
Henderson et al,[5] 2014	23	12,184	0.76 (0.62–0.95)
Roberge et al,[10] 2013	42	27,222	0.62 (0.49–0.78)

CI, confidence interval.
* If aspirin initiated at 16 weeks of gestation or earlier.
† If aspirin initiated at greater than 16 weeks of gestation.

(Table 2).[23–25,37] All costs were converted to 2015 U.S. dollars using the Consumer Price Index. Only costs that occurred in the year of the delivery were considered. Thus, we did not discount costs and assumed they had a gamma distribution.

To calculate neonatal QALYs, we assumed an average life expectancy of 78.7 years for infants who survive the neonatal period, a utility of 1 for healthy term neonates, 0.96 for preterm neonates, and 0 for perinatal demise.[33,38] All QALYs were discounted by 3% per year in the baseline analysis (range 0–5% in sensitivity analysis). In the baseline analysis, we assumed aspirin lowered the rate of preterm birth but had no effect on perinatal death. In sensitivity analysis, we allowed the relative risk of perinatal death with aspirin to range from 0.65 to 1.1.[5–7,9,10]

We performed one-way sensitivity analyses allowing all probability, cost, and life-year estimates to vary to their extremes. We also performed a probabilistic (Monte Carlo) sensitivity analysis in which all variables were allowed to vary simultaneously to their individual extremes. We deemed an approach to be cost-beneficial when it resulted in direct medical cost savings. We defined the incremental cost-effectiveness ratio for this study as the additional cost required to gain one neonatal QALY and judged an incremental cost-effectiveness ratio of less than $100,000 U.S. to be cost-effective.[39] We built the decision model using TreeAge Pro 2011. The study did not involve human participants and was exempt from institutional review board approval.

RESULTS

In the baseline analysis, without aspirin prophylaxis, 167,200 (4.18%) women would develop preeclampsia compared with 166,720 (4.17%) with the College approach, 153,160 (3.83%) with the U.S. Preventive Services Task Force approach, and 152,240 (3.81%) with universal aspirin administration (Table 4). Broader aspirin use would be associated with a parallel reduction in preterm births and maternal deaths but an increase in significant maternal gastrointestinal bleeding events, placental abruption, and aspirin-exacerbated respiratory disease (Table 4). In the baseline analysis, the U.S. Preventive Services Task Force approach was the most cost-beneficial approach, resulting in direct annual medical cost savings of $364,495,520, compared with the College approach, and cost savings of $12,424,360 annually compared with universal prophylaxis (Table 4). Of note, although universal prophylaxis is less cost-beneficial than the U.S. Preventive Services Task Force approach, it is nevertheless highly cost-effective with an incremental cost-effectiveness ratio of $8,174 for each neonatal QALY gained.

In one-way sensitivity analysis, as long as compliance with aspirin was at least 1%, the U.S. Preventive Services Task Force approach was more cost-effective than the no aspirin or College approach. Universal aspirin prophylaxis was both more cost-beneficial and more cost-effective than the U.S. Preventive Services Task Force approach when aspirin conferred more than a 16% relative reduction in preterm birth among high-risk women or when aspirin was at least 71% as effective at preventing preeclampsia and preterm birth in moderate-risk women as it was in high-risk women.

In probabilistic sensitivity analyses (10,000 simulations), compared with no aspirin administration, the College approach and the U.S. Preventive Services Task Force approach were cost-beneficial in greater than 99% of simulations and universal aspirin administration in 97.9% of simulations. The U.S. Preventive Services Task Force approach was more cost-beneficial than the College approach in greater than 99% of simulations and more cost-beneficial than universal aspirin administration in 79.4%. Assuming a willingness-to-pay threshold of $100,000 per neonatal QALY gained, universal aspirin was the most cost-effective approach in 99.3% of simulations. Even at

RR With Aspirin Use (95% CI)		
Preterm Birth	Perinatal Death	Placental Abruption
0.93 (0.89–0.98)	0.91 (0.81–1.03)	1.13 (0.87–1.48)
0.22* (0.1–0.49); 0.90† (0.83–0.97)	Not reported	0.62* (0.08–5.03); 1.56† (0.96–2.55)
0.92 (0.88–0.97)	0.86 (0.76–0.98)	1.10 (0.89–1.37)
0.86 (0.76–0.98)	0.81 (0.65–1.01)	1.17 (0.93–1.48)
0.81 (0.71–0.92)	0.87 (0.69–1.10)	1.24 (0.79–1.95)

Table 2. Probability Estimates

Pregnancy Risk	Base Case (%)*	Range (%)*	Reference
Preeclampsia			
Low risk	2.1	1.5–6.7	3,6,27,45
Moderate risk	6.2	4.1–8.3	3,9
High risk	19.4	12.0–26.0	6,9,11
RR with aspirin for high-risk women†	0.76	0.49–0.97	5–7,9,10
RR with aspirin for moderate-risk women	0.88	0.49–0.97	5–7,9,10
Preterm birth			
Low risk	7.5	3.3–10.7	3,27,29–31
Moderate risk	16.1	8–24.2	3,6,9,11,47
High risk	40.0	18.0–43.0	5,6,9,11,26
RR with aspirin for high-risk women†	0.86	0.71–0.98	5–7,9,10
RR with aspirin for moderate-risk women	0.93	0.71–0.98	5–7,9,10
Placental abruption			
Low risk and moderate risk	0.5	0.1–0.7	5,44,64
High risk	1.6	0.7–2.0	5,11,64
RR with aspirin	1.2	0.79–1.95	5–7,9,10
Perinatal death			
Low risk	0.54	0.1–1.2	3,32,60,65
Moderate risk	2.49	0.54–5.3	9,66
High risk	5.67	1.08–7.2	9–11
RR with aspirin for high-risk women†	1.0	0.65–1.1	5,9
Gastrointestinal bleeding in pregnancy	0.017	0.0025–0.07	67–69
RR with aspirin	2.34	1.0–6.97	68
Exacerbated respiratory disease with aspirin	0.48	0.29–0.70	34,35
Maternal mortality (per 100,000)			
Overall	16	—	33
Attributable to preeclampsia	1.5	1–1.9	4
Misclassifications of moderate-risk population	20	0.0–50	28
Compliance with aspirin	77	0–100	20
Cost per case (2015 $U.S.)			
Preeclampsia	3,375	1,688–5,063	21,70
Preterm birth	19,140	9,570–28,710	22,23
Aspirin for the length of gestation	5	2.5–7.5	36
Placental abruption	5,471	3,454–34,579	23,25
Gastrointestinal bleeding	11,272	7,600–21,104	24,25
Aspirin-exacerbated respiratory disease	925	0–4,000	37
QALYs expected for a term newborn‡	30.1	19.6–78.7	33
QALYs expected for a preterm newborn	28.9	18.8–75.6	38

RR, relative risk; QALYs, quality-adjusted life-years.
* All data except RR with aspirin given as %.
† RRs for the base case are from Henderson et al.[5] RRs used in sensitivity analyses represent the most extreme 95% confidence bound from the five available meta-analyses. These RRs were applied only to the moderate- and high-risk groups.
‡ Based on an average life expectancy of 78.7 years, discounted at 3% (range 0–5%).

a willingness-to-pay threshold of $20,000 per QALY, universal aspirin was the most cost-effective approach in greater than 95% of simulations.

DISCUSSION

Prior randomized studies, which cumulatively have included more than 37,000 women at risk for preeclampsia, clearly establish that low-dose aspirin prophylaxis lowers the risk of preeclampsia and preterm birth and confers these benefits without apparent harm. Thus, the remaining question over low-dose aspirin use in pregnancy is not a scientific one, but rather a question of health policy: who should be treated and what are the expected risks, benefits, and costs of one policy compared with another? Our analysis suggests that the U.S. Preventive Services Task Force approach is the most cost-beneficial, achieving 94% of the possible preeclampsia rate reduction that can be obtained with aspirin while exposing only one fourth of pregnant women to the theoretical risks of aspirin. Compared with the U.S. Preventive Services Task Force approach, universal aspirin administration would require more than 3 million women to take aspirin to prevent 920 cases of

Table 3. Risk Factors for Preeclampsia Among Pregnant Women in the United States*

Preeclampsia Risk Factor	No. of Women (%)	Reference
Pertinent to the College approach		
History of preeclampsia requiring delivery at less than 34 wk of gestation	7,600 (0.19)	45–47
History of recurrent preeclampsia	6,800 (0.17)	45,48
One or both risk factors†	**14,000 (0.35)**	45
Pertinent to the USPSTF approach		
High risk factors		
History of preeclampsia	76,000 (1.9)	45,49,50
Multiple gestation	132,000 (3.3)	51
Chronic hypertension	48,000 (1.2)	46,52,53
Type 1 or 2 diabetes	40,000 (1)	54,55
Renal disease	1,200 (0.03)	56,57
Autoimmune disease	20,000 (0.5)	58,71
Any high risk factor†	**288,000 (7.2)**	45,46,49–59,71
Moderate risk factors		
Nulliparity	1,600,000 (40.0)	60
Obesity (BMI 30 kg/m^2 or greater)	820,000 (20.5)	61,62
African American race	636,000 (15.9)	60
Age 35 y or older	600,000 (15.0)	2,60
Family history of preeclampsia	520,000 (13.0)	3,47
Personal history factors‡	308,000 (7.7)	63
Two or more moderate risk factors but no high risk factors§	**816,000 (20.4)**	2,3,47,53,60–63

The College, American College of Obstetricians and Gynecologists; USPSTF, U.S. Preventive Services Task Force; BMI, body mass index.
* Based on a cohort of 4 million pregnant women who deliver annually in the United States.
† Calculated based on conditional probabilities, see Appendix 2 (available online at http://links.lww.com/AOG/A711). Bold indicates cumulative totals.
‡ Prior small for gestational age, or prior adverse pregnancy outcome, or greater than 10-year pregnancy interval.
§ Calculated based on conditional probabilities, see Appendix 3 (available online at http://links.lww.com/AOG/A712).

preeclampsia, an incremental number needed to treat of 3,325. Even so, universal administration is highly cost-effective and maximizes the reduction in preeclampsia and preterm birth. However, under some plausible estimates for harm, universal aspirin administration would increase the number of placental abruptions, cases of perinatal death, episodes of maternal gastrointestinal bleeding, and respiratory disease relative to the U.S. Preventive Services Task Force approach. Unequivocally, limiting aspirin administration to the narrow segment of women recommended by the College[18] would be associated with little reduction in the burden of preeclampsia, preterm birth, and therefore costs.

Although the U.S. Preventive Services Task Force approach is the most cost-beneficial policy, risk-based approaches have well-recognized and substantial limitations, largely related to their implementation. To the degree that they require a detailed history and consistent risk factor assessment, they are often misapplied and thus fail to reach some proportion of patients who stand to benefit. For this reason, other targeted screening approaches in obstetrics have been abandoned (eg, gestational diabetes and group B streptococcal screening) because of substantially diminished disease detection or prevention compared with universal screening approaches.[28,40,41]

Our analysis has several limitations. Some of our estimates lack precision, for example, the utilities used to calculate QALYs and the extent to which moderate risk factors are independent of one another. Nevertheless, even fairly substantial variations from our point estimates have modest effects on the magnitude of potential benefits and harms. Furthermore, whenever possible we attempted to account for the best recognized risks of aspirin, such as gastrointestinal bleeding, even if there were no data that these risks would apply to a relatively young, healthy population.[42] In the baseline analysis we assumed that aspirin did not lower the rate of perinatal death, although in all of the meta-analyses, the point estimate with aspirin was below 1.0.[5–7,9,10] We may have underestimated the benefits of universal prophylaxis in that it is likely that the risk for preeclampsia operates along a biological continuum, and there is some evidence that women with only one risk factor (eg, nulliparity) would benefit from aspirin prophylaxis.[43,44] As with many decision analyses, our model is unable to account for all important costs. Almost certainly, women who experience complications will be less economically

Table 4. Summary of Pregnancy Outcomes in the Baseline Analysis*

Outcome	No Aspirin	Per the College	Per the USPSTF†	Universal
No. of women treated	0	14,000	940,800	4,000,000
Aspirin costs ($)	0	70,000	4,704,000	20,000,000
Preeclampsia (n)	167,200	166,720	153,160	152,240
Incremental cases avoided‡	—	480	13,560	920
Incremental NNT‡	—	29	68	3,325
Related costs ($)	564,374,160	562,682,280	516,946,400	513,790,680
Preterm birth (n)	452,360	451,800	435,160	433,800
Incremental cases avoided‡	—	560	16,640	1,360
Incremental number needed to treat‡	—	25	56	2,249
Related costs ($)	8,868,234,720	8,856,711,440	8,522,864,920	8,495,785,120
Placental abruptions (n)	22,709	22,738	23,725	25,681
Incremental no. of cases		29	987	1,956
Related costs ($)	124,241,880	124,401,360	129,805,680	140,505,160
Maternal gastrointestinal bleeds (n)	700	703	870	1,422
Incremental no. of cases		3	167	552
Related costs ($)	7,890,160	7,918,640	9,804,920	16,031,200
Aspirin-related respiratory distress costs ($)	0	47,720	3,210,040	13,648,160
Maternal death	640	640	635	634
Incremental deaths avoided‡	—	<1	5	6
Incremental number needed to treat‡	—	74,826	185,360	509,867
Neonatal QALYs	117,967,920	117,968,560	117,987,000	117,988,520
Incremental QALYs		640	18,440	1,520
Total incremental cost savings ($)‡	—	12,909,480	364,495,520	−12,424,360

The College, American College of Obstetricians and Gynecologists; USPSTF, U.S. Preventive Services Task Force; NNT, number needed to treat; QALYs, quality-adjusted life-years.

* Based on a cohort of 4 million pregnant women who deliver annually in the United States.

† Assumes 20% of women with two or more moderate risk factors are not identified and therefore do not receive aspirin.

‡ Compared with the prior approach (the College compared with no screening, U.S. Preventive Services Task Force compared with the College, universal compared with U.S. Preventive Services Task Force).

productive in the short term, and we did not account for this diminished productivity nor did we account for the costs associated with prematurity beyond hospital discharge.[22] Although we considered it, we did not account for potential aspirin-associated medicolegal costs, if for no other reason that the magnitude and direction of these costs are unpredictable.

We conclude that to not use low-dose aspirin on a more widespread basis than is recommended by the College is a missed opportunity to prevent preeclampsia, preterm birth, and decrease health care costs. Ideally, aspirin should be initiated before 16 weeks of gestation.[7] From the standpoint of parsimony, and minimization of potential aspirin risks, the U.S. Preventive Services Task Force approach is a better approach than universal administration. However, universal administration, with its ease of implementation and potential to maximize the health benefits of aspirin, may in fact be the more rational and clinically pragmatic approach. In either case, broad low-dose aspirin administration to pregnant women would almost certainly reduce maternal and perinatal disease, save lives, and lower health care costs in the United States by millions of dollars annually.

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