

**SLIDE 1:** Good afternoon everyone and welcome to our webinar: The Economic Impacts of Breastfeeding: A Focus on USDA's WIC Program. My name is Kellie Burdette and I will be your host. At any time during today's webinar you may enter a question into the chat feature at the bottom left corner of your screen and our speaker will answer questions at the end of the presentation. Our speaker today is Dr. Mark Prell. Mark is a senior economist with the Food Economics Division of USDA's Economic Research Service. His area of focus is studying USDA's Food Assistance Program and how to make fuller use of administrative records for statistical purposes. Mark earned his Ph.D. in economics from MIT. I think we're ready to start. So Mark, you may begin your presentation.

Good day, I'm Mark Prell and thank you Kellie for that introduction. As was mentioned, I'm going to talk in today's webinar about the economic impacts of breastfeeding focusing on the WIC program, which serves women, infants, and children. WIC promotes breastfeeding because breastfeeding confers a number of health benefits upon both infant and mother, including a lower incidence of certain diseases. The webinar draws upon results from a new ERS report that I prepared along with my colleagues Victor Oliveira and Xinzhe Cheng.

**SLIDE 2:** I begin with a quick summary; a type of sneak preview of what the webinar will cover. As of 2016, there was a gap between the breastfeeding rates of women and infants in WIC, and medically recommended levels of breastfeeding. According to results and estimates in our report, if breastfeeding rates in WIC were to increase and close that gap, the number of participants in WIC would increase. Also, costs to the WIC program would rise. However, cost to Medicaid could be expected to fall. On net, federal costs for the two programs in total would rise. Health related economic costs to WIC households would decline. In this webinar, we'll see the sizes of these changes. Which ones are relatively bigger and which are smaller, as well as the reasons for why these changes occur, and why there are economic benefits to society when breastfeeding rates increase.

**SLIDE 3:** We proceed by first examining background information on WIC and breastfeeding before turning to the goals and framework of the ERS report. Then, I'll give the details on the effects of increased breastfeeding on WIC participation and program costs, and then on health related costs, and then wrapping up with conclusions.

**SLIDE 4:** By way of background, Congress gave an important mission to USDA's Special Supplemental Nutrition Program for Women Infants and Children, which is usually called WIC for short. WIC's mission is to safeguard the health of low-income, nutritionally at-risk, pregnant, breastfeeding, or postpartum women, and infants and children up to their fifth birthday. WIC is administered by USDA's Food and Nutrition Service. To achieve its mission, WIC provides various types of benefits to WIC participants. They receive food packages tailored to the type of participant they are. Also, WIC provides breastfeeding support, nutrition education, and referrals for medical and social services. In fiscal 2017, WIC served over seven million people per month at an annual cost of \$5.6 billion. Nearly half of all U.S. infants are served by WIC.

**SLIDE 5:** To be eligible for WIC, a person must meet certain requirements. As a means-tested program, WIC has limits on income, which can be no greater than 185 percent of poverty

guidelines. For example, currently, 185 percent of poverty equals about \$46,000 per year for a family of four. The person must also be nutritionally at-risk.

**SLIDE 6:** A WIC mother chooses one of three feeding methods for her infant. She can fully breastfeed the infant, or partially breastfeed the infant, or fully formula feed the infant. Her choice of feeding method effects which WIC food package she and the infant receive each month. The picture shows the mother and infant's food packages if there is full breast feeding, which has the largest food packages for mothers. Partial breastfeeding women receive smaller amounts of food than fully breastfeeding women, but more than those who fully formula feed.

**SLIDE 7:** Among WIC regulations and policies, some directly address breastfeeding. Women in WIC are encouraged to breastfeed with an exception if there are health reasons against it. The WIC program allows breastfeeding women to participate in WIC longer, for 12 months, than if they are fully formula-feeding. In contrast, fully formula feeding mothers can participate only six months postpartum. That difference has important effects we consider below. WIC promotes exclusive breastfeeding. As I mentioned, breastfeeding confers health benefits upon both infant and mother. Furthermore, the protective effects of breastfeeding increases when it is maintained for longer periods and when breastfeeding is exclusive. Exclusive breastfeeding means that the infant receives only breast milk, no solid foods or other liquids.

**SLIDE 8:** The medical community, as represented by the American Academy of Pediatrics, as well as other U.S. Health Organization's, recommends exclusive breastfeeding for about six months followed by continued breastfeeding for one year or longer, as complementary foods are introduced. In other words, infants are breastfed for their first year, and during the first six months, they consume only breast milk. But what do data say on how much those recommendations are being followed?

**SLIDE 9:** This diagram shows breastfeeding rates among children born in 2015. The red columns represent the breastfeeding rates of all U.S. infants. The blue columns represent the infants in WIC. The first three groups of columns show breastfeeding rates by duration, initiation, at six months, and at twelve months. The two groups of columns on the right show exclusive breastfeeding, that is, just breast milk at three and six months. The chart shows that breastfeeding rates in general fall short of recommended levels for both U.S. infants and WIC infants. In addition, breastfeeding rates of WIC infants are below those of other infants. For example, in the columns on the far right for when the infant is six months old, only about 18 percent of WIC infants are exclusively breastfed, which is less than the 25 percent of U.S. infants on average and far less than the AAP recommendations.

**SLIDE 10:** This background information provided the context for understanding the objectives of the ERS report to which we now turn.

**SLIDE 11:** Recognizing the positive impact of breastfeeding on infant and maternal health and the important role of WIC in encouraging breastfeeding, in March 2018, the Senate Committee on Appropriations directed ERS to conduct a study on the economic benefits of breastfeeding among WIC participants, including its potential cost savings for Medicaid and the WIC program. The ERS report I am covering in this webinar is the result of that congressional directive.

**SLIDE 12:** So, the objectives of our study were to estimate the effects that increase breastfeeding rates in WIC would have on WIC program costs, Medicaid costs, and economic benefits to WIC households. It is something of a unique feature of this study that it examines the economic impacts from the perspective of different parties: the WIC program, the Medicaid program, and WIC households or their health insurance providers.

**SLIDE 13:** This slide shows the conceptual framework used in the study to quantify the economic impacts of breastfeeding in WIC. By the way, the latest year for which we could get certain data was 2016. So we compared actual costs based on 2016 breastfeeding rates versus estimated costs if breastfeeding rates, hypothetically, reached medically recommended levels. Actual costs are greater than estimated costs. They are a heavier economic burden. The difference between those two levels of cost gives the estimated or predicted impact of increased breastfeeding rates in WIC. Developing the estimated costs for a hypothetical scenario was the harder part of the study.

**SLIDE 14:** To do so, we had to operationalize what medical recommendations mean for the study. The recommendations by the American Academy of Pediatrics, do not address whether some women are unable to breastfeed. The ERS study followed previous literature and assumed that 10 percent of women are not able to breastfeed due to physiologic difficulties. So, we operationalized medically recommended breastfeeding rates to mean that 90 percent of infants are breastfed for 12 months with no infant formula. The 90 percent level takes a level of universal breastfeeding and assumes that 10 percent of mothers participating in which are unable to breastfeed.

**SLIDE 15:** We can now examine the effects of increased breastfeeding on WIC participation and program costs.

**SLIDE 16:** This slide lists the effects on WIC that the study examined. The number of participants is a key outcome in its own right. Congress established WIC to serve eligible women, infants, and children. So the number of them who participate in the program is an important statistic. In order to estimate the effect of breastfeeding on WIC program costs, the study had to take into account three mechanisms or pathways by which increased breastfeeding can affect costs to changing the number of participants, by changing food package costs, or by changing costs of Nutrition Services and Administration or NSA for short.

**SLIDE 17:** Turning first to participation, if breastfeeding rates in WIC hypothetically reached medically recommended levels, we estimate that the number of mothers participating in WIC would increase by almost 646,000 women per month. Actual monthly participation in 2016 was about 1.1 million, as shown by the bar on the left. Participation was estimated to increase to about 1.7 million on the right. The difference is an increase of about 646,000 thousand per month. That represents an increase of about 58 percent in the number of mothers or an 8 percent increase in the total number of participants each month. Not just mothers but all participants.

What's behind this increase? What connects breastfeeding and WIC participation? There is a subtle effect involving the dynamics of participation of how long mothers participate until they leave the program. To compare actual and hypothetical scenarios, we assume the same number

of WIC mothers enroll in WIC. Yet if breastfeeding increases, the number who participate per month still goes up. That's because breastfeeding mothers can participate in WIC for 12 months postpartum to supplement maternal diet during breastfeeding. In contrast, we saw federal regulations limit the participation of non-breastfeeding mothers to only six months postpartum. So, an increase in the percentage of WIC mothers who breastfeed will increase average duration, that is, the length of time that the average mother participates. In turn, that increase in how long a typical WIC mother is in the program, increases the number who participate in a given month. For example, other factors constant, if all WIC mothers shifted from everyone at six months duration to everyone participating for twelve, that would simply be double the number of WIC mothers in any given month. In the end, an increase in breastfeeding increases the number of participants per month, which results from the same women staying in WIC longer not from more women entering the program.

**SLIDE 18:** As it is, for the studies hypothetical increase of breastfeeding rates, the increase in WIC mothers per month is not double but about 60 percent because some WIC mothers are already fully breastfeeding for 12 months.

**SLIDE 19:** Next, let's look at the effect of increased breastfeeding rates on food package costs, which account for about two-thirds of total WIC costs. There's a lot to talk about, as some of the effects work in opposite directions.

**SLIDE 20:** Food package costs are estimated to decrease by about \$34 million. Food package costs reflect changes in cost for mothers and costs for infants. The cost of mother's food packages goes up by about \$513 million. That occurs for two reasons. First, in recognition of their increased nutrient and caloric needs, and to incentivize mothers to breastfeed, the fully breastfeeding packages provide greater quantities of food and are therefore the most expensive of the packages for mothers. Second, breastfeeding mothers stay on WIC longer. Both factors add the costs by about \$513 million. However, the cost of infant's food packages goes down by even more, by about \$547 million when infants are breastfed. Infants who are breastfeeding do not even receive a food package for their first six months. Altogether, overall food package costs decrease by about \$34 million. Program costs also include those NSA costs which are the other one-third of WIC costs.

**SLIDE 21:** NSA costs would increase by about two hundred and \$86 million. NSA costs include breastfeeding promotion and support costs, costs of program management or overhead, client services such as issuance of food benefits and referrals, and nutrition education. Average monthly NSA costs are about \$30 for a pregnant or breastfeeding woman, over \$10 more per woman than for other postpartum women. And as before, more breastfeeding mothers stay on the program longer, so increasing breastfeeding raises NSA costs.

**SLIDE 22:** This figure summarizes the impacts of increased breastfeeding to WIC. Note that it is a two axis chart, cost on the left, number of participants on the right. The three light blue bars and the cost axis show that infant's food package cost decrease while mother's food package costs increase, as does NSA costs. The net effect of all three, represented by the dark blue column, is to increase total program cost to WIC by about \$252 million. That figure is the

bottom line estimate for the effect on WIC program costs and represents an increase of 4.2 percent of the program's total cost in 2016. At the same time, with the orange bar and the right-hand axis, the total number of monthly participants in WIC would increase. Now, while the study used 2016 as a baseline, these changes in costs and participation can be thought of as annual effects that would occur each year not just in 2016.

**SLIDE 23:** The economic impacts of increased breastfeeding rates in WIC extend beyond the cost to the program. By reducing the incidence of various diseases, increase breastfeeding among WIC participants reduces health related costs to WIC households or their private and government health insurance providers. Let's explore the details.

**SLIDE 24:** Here is a list of 14 diseases included in the ERS study and a picture of one very curious baby getting an ear exam. Among these 14 diseases, our study covered nine pediatric diseases and five maternal diseases. Studies in the medical literature find that infants who are breastfeed, or who breastfeed for longer time, have a reduced risk of catching certain diseases. Similarly, mothers who breastfeed have a reduced risk for certain diseases themselves. So increased breastfeeding means fewer WIC participants are likely to get a disease. These diseases can be expected to have different effects on health costs. Currently, some diseases are more prevalent, such as gastrointestinal illness or GI, among infants. While others are rarer, such as ulcerative colitis. Some diseases are relatively costly per case, such as ovarian cancer and diabetes among the mothers, while others are less costly such as GI for infants. Infant diseases occur at or near the time of breastfeeding. Maternal diseases can occur years later. To conduct a study on cost impacts, all these factors needed to be taken into account simultaneously.

**SLIDE 25:** To estimate these health-related cost effects, the study made use of a valuable tool that has been made publicly available by the US breastfeeding committee, which is an independent nonprofit organization consisting of a coalition of over 50 organizations along with governmental members including the Food and Nutrition Service, which administers WIC. The U.S. breastfeeding committee has developed a web-based breastfeeding savings calculator. The calculator was based on an underlying model presented by Arctic and by Stubing in peer-reviewed journals in 2017. Using evidence from the nutrition and medical literature the calculator produces estimates of the cost savings from improved breastfeeding rates for the U.S. population. Now, for the WIC population, the ERS studies calculation of health-related cost savings, use the same method as this web-based calculator. The calculator in our study estimate health related benefits from improved breastfeeding rates, which take the form of cost savings.

**SLIDE 26:** Savings from increased breastfeeding are estimated by reducing three types of costs: medical costs, which include physician fees, hospital costs and so forth; non-medical costs, which are lost wages for missed work while a mother recovers from a disease, or while a parent takes care of an ill infant; and costs of early death resulting from reductions in diseases that increase the risk of death. Such deaths or early in the sense that under improved health the risk of death would be lower, adding to longevity. The costs of early deaths are based on the value of a statistical life. For example, medical research has found that breastfeeding reduces the incidence of breast cancer in mothers. So, the calculator places a value on the life saved.

**SLIDE 27:** The ERS study estimated the cost savings that could be gained if breastfeeding rates of WIC mothers increased from 2016 levels to medically recommended levels. The study modified the calculator by incorporating data on the number of infants in WIC and the breastfeeding rates of infants and mothers in WIC. The results indicate that health-related cost savings would total about \$9.1 billion annually, including three components. There are savings of about six hundred and 35 million dollars in non-medical costs, and there are \$6.9 billion savings from reductions in early death. This second component is 3/4 of the total savings of \$9.1 billion and as is result of the value of saving lives, because the value of even one statistical life is large, in the range of three to thirteen million dollars depending on age. And finally there are \$1.5 billion in medical cost savings. Again these figures represent annual cost savings rather than one time only savings. Let's focus in on this 1.5 billion in saved medical costs. Some of that estimated cost savings would appear in the pockets and budgets of the WIC households. Another portion of it would accrue to health insurers to the degree that WIC participants are covered by health insurance plans. For example, for WIC participants who also participate in Medicaid, a portion of that 1.5 billion would be saved by the Medicaid program, in which case taxpayers would receive the savings rather than the WIC households. So we want to estimate the effects of increasing breastfeeding on Medicaid costs, examining what portion of the 1.5 billion of savings can be allocated to Medicaid.

**SLIDE 28:** We begin by noting that 71 percent of WIC participants also participate in Medicaid, showing that Medicaid plays a major role in maintaining the health of WIC participants. By itself, that 71 percent figure suggests that there would be about \$1.1 billion in Medicaid savings. That figure of 1.1 represents the long-run Medicaid savings if breastfeeding WIC recipients are enrolled in Medicaid far in the future because some diseases such as breast cancer may not occur until many years have passed. But some WIC participants do not remain on Medicaid in the long run, so that 1.1 billion is probably an overestimate of Medicaid cost savings. We then estimated savings that accrue while the WIC participant is still likely to be enrolled in Medicaid. For that likely cost savings, we restricted our attention to a subset of the 14 diseases, those that have a short time horizon, such as GI or ear infections.

**SLIDE 29:** We estimated that increased breastfeeding rates in WIC would result in a total savings to Medicaid of about \$176 million. Some of that figure, about 112 million, is saved at the federal level. The rest of it is at the state level because both the federal government and the states fund Medicaid.

**SLIDE 30:** If breastfeeding rates in WIC increased, the estimated overall effect on federal costs has two components. We saw earlier that annual cost to WIC would increase by about 252 million and Medicaid costs would fall by about 112 million, that's the federal portion. The net effect on an annual federal cost is an increase of about \$141 million annually. Although increased breastfeeding rates in WIC would result in higher overall cost to American taxpayers of about 141 million, remember that WIC households, or their insurers, would realize health-related cost savings of about \$9 billion and in addition more mothers would get to participate in WIC and receive program benefits for longer periods, up to 12 months.

**SLIDE 31:** in conclusion I should point out that this study like all studies had limitations. For example one limitation is a common one, the underlying medical literature mainly consists of observational studies rather than experimental studies that have fully controlled conditions. Another limitation of the study is that it does not consider the additional financial investments in breastfeeding promotion support that would be needed to achieve medically recommended breastfeeding levels.

**SLIDE 32:** the chart shows these medically recommended levels at 90 percent by the dashed red line at the top. It also shows the current breastfeeding rates. Breastfeeding promotion and support efforts by entities such as WIC, other government agencies, health care providers, private insurers, employers and other organizations, would likely all have to be scaled up considerably to reach an ambitious goal of a 90 percent breastfeeding rate for WIC mothers.

**SLIDE 33:** In conclusion the study found that increased breastfeeding rates in WIC would increase WIC program costs. Although there would be lower federal Medicaid costs, that is only a partial offset of the WIC costs, there would be an increase in total federal costs. More mothers would be allowed to participate in WIC longer if they breastfed, and health-related cost to WIC households or their insurers would fall.

**SLIDE 34:** finally we conducted a sensitivity analysis which altered some of the specifications of the study allowing for breastfeeding rates to increase, but to less than 90 percent. We found that the magnitudes of the various effects listed above depends, as you would expect, on the degree to which breastfeeding rates increase and partial breastfeeding occurs.

**SLIDE 35:** thank you for being a part of the CRS webinar my email and the emails of my co-authors are listed below and the report is on the ERS website.

Thank you, thank you mark. We do have some questions, here's one. You mentioned that to be eligible for WIC, a person has to have low income and be at nutritional risk, how would you define nutritional risk?

Oh, there are two major ways that a person can be nutritionally at-risk for WIC. First there are medically based risks such as anemia underweight or a history of pregnancy complications. Second, there are diet based risks, such as an inadequate dietary pattern. A health professional, such as a physician a nutritionist or a nurse, makes the determination of nutritionally at risk for WIC applicants.

Okay and here's another question, in your study, you assumed that breastfeeding rates would be at 90 percent while current breastfeeding rates fall below that. Do you think it is likely that breastfeeding rates will ever reach 90 percent?

Oh well that's a good question our study did not address the question of how likely or unlikely it would be to reach the medically recommended levels of 90 percent. Instead we treated the medically recommended level as a given target and simply asked what the effects would be on WIC if the target was reached. the 90 percent target can be thought of as ambitious, to address that the study looked at a few other possible targets, that was the sensitivity analysis, again without speculating on the probability of reaching any particular target.

## Webinar Transcript: The Economic Impact of Breastfeeding: a Focus on USDA's WIC Program

Okay thanks. Does an infant who is fully breastfeeding get a food package? I mean, if the infant is fully breastfeeding, doesn't that mean the child doesn't have other foods.

Oh, a WIC infant who is fully breastfeeding is treated differently by WIC before versus after six months of age. Before six months of age, the infant who is fully breastfeeding, does not get a food package. However, breastfeeding infants older than six months can be introduced to other foods such as infant cereals. Such foods are included in the infant food package even for fully breastfeeding infants, up for those who are over six months of age.

All right, we have a comment and another question. Very interesting study, how much did you value a statistical life to be?

Oh, the value of the statistical life took on a range of between three and thirteen million dollars, depending on age. So it wasn't one number, it was a set of numbers that have been taken from the specialized literature that develops estimates of the value of a statistical life.

All right, here's another question. Mothers and infants are two different groups with different diseases, how much of the health-related cost savings is for mothers, and how much cost savings is from infants?

Oh yes, in the webinar we saw the overall estimate of \$9.1 billion in health-related cost savings. The report found that about 4 billion of the total was from improving infant health and about 5 billion was from improving maternal health. That result is important because as a generalization the literature may tend to focus on improved health of infants through increased breastfeeding. Contribution of Bartick and her co-authors and of the ERS study is that we expanded the scope to look at mothers - in addition to infants.

Very good, and Mark that's all the questions that we have so I'd like to thank everybody for attending today. Thank you and have a great day.