

Breastfeeding Choices: Economic, Environmental, and Health Effects

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Abstract

From the moment a woman becomes pregnant, the choices she makes not only affect her but also her child from that point on. One of the first important choices a mother makes is whether to breast feed or bottle feed. Every woman is different and making a decision like this one is not to be taken lightly. Many factors can contribute to the final decision. In some cases mothers are left with no options and must choose one method whether they like it or not. My paper will outline how mothers make their choice from an economic, physical, and environmental standpoint. I will try to explain how the economic level of not only the mother but also of the household in general influences newborn feeding methods, where lower economic levels tend to breast feed but children still face many health issues. Also the feeding method depends on the mother and newborn's postpartum condition. For example, premature babies are often not able to latch on to the mothers to feed so they are strictly bottle fed. Finally the environment where the family resides plays an important role in feeding method. In areas like the southern Central Valley, where water quality is extremely poor, breast feeding is favored because of the pollutants in the city's water supplies. In each case the best methods are highlighted to create consciousness about the importance of feeding methods for newborns. All data will be gathered from primary source articles and current news reports pertaining to any statistical information on breastfeeding. I plan to conduct an informational search that only includes data from this area, specifically, EMC (Emanuel Medical Center) in Turlock with the Lactation Nurse and RN's in the Mother/Baby Postpartum ward. My main source is the informational packets given to new mothers at the hospital.

Introduction

Breastfeeding is a natural behavior mammals use to feed their young. In the last few years, there has been a bigger emphasis placed on breast feeding rather than bottle feeding. Breastfeeding has become instrumental to infant survival from infectious diseases, both viral and bacterial. This trend toward recommended breastfeeding has been seen in both industrialized and rural countries alike (M'Rabet et. al 2008). Choosing to breast feed helps improve the immune system of the growing child. This is vital within the first months after birth because within that short amount of time the immune system of the child is still being molded and growing accustomed to the world outside the womb (M'Rabet et. al 2008). Breastfeeding is attributed to better cognitive growth for the child and a decrease in the occurrence of postpartum bleeding and both ovarian and breast cancer risk is reduced in the

mother. Also, in the long run, it has been demonstrated that breast feeding has reduced the risk of obesity throughout the child's life (Thu et al 2012). Here in the United States, organizations like the American Academy of Pediatrics (AAP) have done studies to monitor the actual number of mothers breastfeeding. In a country like the United States, industrialized and one of the top nations in the world, one can assume that the numbers of breastfeeding mothers would be high and even exceed expectations, but, in reality, the United States falls well below predicted rates (Palmquist and Doehler 2014). The low numbers can be attributed to many factors. Some causes include the socioeconomic status of the parents of the newborn (Palmquist and Doehler 2014), water quality in the area the family resides, as well as overall costs of maintaining a newborn on formula and/or breast milk.

In this paper the basic information about breastfeeding and its benefits when compared to

bottle feeding will be provided as a background to then explore the issue from an economic perspective. The choice of whether to breast feed or not will also be explored by socioeconomic class and the effect of the choice on the economy. The choices made by a new mother on whether to breast feed or bottle feed are highly influenced by economics and prior knowledge and culture. On average, mothers who are in a higher income bracket with access to good healthcare and social support groups encouraging breastfeeding are more likely to breast feed for the recommended six months and even go beyond that to about the child's first year (Palmquist and Doehler 2014). Included will also be environmental factors associated to the area in which the baby is to be raised. Different health risks for both mother and baby are dependent of environmental qualities.

Background

Breast feeding has been noted as one of the most advantageous actions that can be taken by a mother to help her newborn. The benefits are not only immediate, but also extend into the future helping the child have a better quality of life (Weimer 2000). Choosing breast milk over formula increases the chances of infant survival by lowering the chances of contracting infectious diseases. Not only that, cognitive development also increases. Plus the mother's chances of postpartum bleeding and both ovarian and breast cancer risks are reduced (Thueta 2012). To increase the number of those who can benefit, the World Health Organization recommends exclusively breast feeding a new born for the first six months (Casiday 2004). Because of these possible benefits, as well as others, many public and private organizations recommend breast feeding. The American Academy of Pediatrics (AAP) calls for breast feeding up to one year, while the American Dietetic Association (ADA) and Surgeon General call for similar lengths of time (Weimer 2000). In the first couple months, the immune system of the newborn is still being built. Being outside the womb, the child needs to begin to get used to the atmosphere since it is no longer 100%

dependent on the mother for its immune health. Breast feeding offers that child the best chance of living beyond infancy (M'Rabet et al. 2008).

The benefits exhibited by the choice of breast feeding over bottle feeding are not only reflected in the health of mother and child, but also on the economy of the household and community. In 1998 about 64 percent of mothers giving birth in hospitals were choosing to breast feed over bottle feeding. Out of these women a little over a quarter of them continued to breastfeed for the recommended six months (Weimer 2001). This is a problem because, nationwide, the percentage of women breastfeeding should be higher according to different studies. A reason the numbers are so low is because of the socioeconomic background of each mother. Mothers from households that fall above the poverty lines are more capable of following the recommended six month feeding regime, while mothers at or below the poverty line, must return to work much faster to continue to provide for their families. In 1996, a survey was conducted nationwide and found that less than half of women who lived in households that made less than \$100,000 chose to breast feed and out of that half only one quarter breastfed for 6 months (Weimer 2001).

There has been a big focus on the environment in the last couple of years and many have argued that breastfeeding is a great choice for the environment because there is no need for the plastic waste of bottles or formula containers. Also, parents can save more money by choosing to breast feed. The money that would be spent on bottles and formula can be put to other uses. The environment also can help choose whether or not a mom can and should bottle feed depending on the qualities of food and drinkable water available.

Thesis and Rationale

In the last couple years the economy has not been at its best and people are always looking for any opportunity to save money. Breast feeding has been said to be the best form of early nutrition for newborns. It not only provides them

with the correct nutrients to stimulate their growth and development, but also helps the mother and the household economy. Mothers who breast feed are healthier, requiring less time away from the duties and activities they performed before pregnancy. Every year approximately \$3.4 billion are spent by families on formula and all the necessary accessories (Bartick 2011). What breast feeding does, both from a health and economic perspective, is to make things easier for both the mothers and newborns.

Methods

My work consists of an economic study of the costs of breast feeding when it compared to the costs of bottle feeding. Along with that, the environmental factors associated with each choice of feeding style are also explored. The methods used mostly include data retrieval from previous and similar studies. Some data was collected from WIC website and informational papers provided by Medella, a company that provides breastfeeding information to new mothers used at EMC (Emanuel Medical Center, Turlock, CA). Now that breast feeding has begun to become popular again, more studies have been done on the benefits of a mother's milk. Also included in these studies are the potential effects on the economic stability of both the family's household and that of the entire economy as a whole. Monetary values presented are estimates of current trends made into potential future projections. This project is solely performed from primary documents and data retrieved from previously performed studies.

Findings

Economic Effect

The economy of the United States is measured based on a term referred to as fiscal years. Fiscal years are not in accordance with the calendar years. At the end of the 2015 fiscal year, the United States debt will be \$21.694 trillion (Chantrill 2015). With each passing day this number only seems to get bigger and bigger. Many people attribute some of this deficit to the

misuse of government assistance. These programs use tax payers' money to fund for public health and other services for lower income families. Sometimes there are people who cheat the system and use these resources when they do not need them, but that will never change. A lot of these resources are specifically designed to help mothers of lower economic standing provide for their children. With so many people using these programs what little money is being set aside for aid is being sourced out and not being used to the fullest by those who really need it.

The U.S Department of Agriculture's Special Supplemental Nutrition Program for Woman, Infants, and Children (WIC) is one of the best known government aid programs. They buy the largest amount of infant milk formula in the United States. They account for about 40% of the orders made in the country. The total amount of tax dollars used to purchase the formula is about \$567 million, after receiving a rebate (Weimer 2001). This is an alarmingly large number being spent on just one product within one organization alone. One study suggested that if some of the infants reduced their formula intake and replaced it with breast milk, WIC would be saving approximately \$750,000 (Weimer 2001). The reduction in users of WIC would allow for money being used currently for that to be repurposed for other governmentally funded programs.

It isn't just the formula alone that needs to be purchased. When a mother chooses to bottle feed, many more accessories need to be purchased to accommodate that choice. In a household with one newborn, the average cost of just formula is about \$1500 per year (Bartick 2011). That is not including the price of bottles, bibs, bottle cleaning supplies, bottle carry bags, and pacifiers. Alone those products range from \$15 bibs to \$40 bottles. On the other hand breast feeding costs add up to about \$2000 annually (Bartick 2011). When breastfeeding, bibs and other products are necessary, but most of the items purchased can be used multiple times for extended periods of time unlike some of the

bottle feeding supplies. Not only is the program saving money, so are the parents of the infants. Breast milk increases the tolerance of the child's

immune system lowering the need to seek emergency medical care.

Table 1: The average yearly costs of bottle feeding broken down by basic items needed.

Bottle Feeding					
Item	Quantity	per year	Price Range	Min Cost	Max Cost
Bottles	6/month	72	\$12.59-34.49	\$906.48	\$2,483.28
Nipples	1/ 3.5 months	4	\$3.99-4.89	\$15.96	\$19.56
Bottle drying rack	1/ year	1	\$9.99-12.99	\$9.99	\$12.99
Bottle brush	1/ 6 months	3	\$6.99-14.99	\$13.98	\$29.98
Bottle warmer	1/ year	1	\$24.99-69.99	\$24.99	\$69.99
Purified water	8/ month	48	\$0.89-3.09	\$42.72	\$148.32
Bottle bag	1/ year	1	\$10.99-14.19	\$10.99	\$14.19
Enfamil	1 can/ week	52	\$25.99-36.99	\$1,351.48	\$1,923.48
Total Costs				\$2,410.91	\$4,761.71

Health Effects

The milk formula recipes have come a long way from the 19th century when infants, whose mothers began joining the work force thanks to industrialization, were being fed mixtures of goat milk with cereals, sugars, honey, and other ingredients (Koletzko 2010). Since that time, people began noticing that infants fed on these mixtures were not surviving infancy in the same numbers as children being breast fed. Finally in 1865 Justus von Liebig came up with the precursor of modern bottle formula method (Koletzko 2010). Thanks to his initial advances, as the years progressed, the infant mortality rates went down for those children not being breast fed. Even with constant advances in the methods trying to create a formula based milk to closely resemble breast milk, the average fee for hospitalizing an infant in the United States is about \$5000, \$450 million on an annual basis. In the end medical costs for sickly babies can range anywhere from \$1.1 to \$1.32 billion (Weimer 2001). Even after all these advancements, formula milk still has a short shelf-life. Breastmilk can be kept frozen for up to a year and still be considered viable. A small amount of the nutrients are lost during freezing.

Some infants begin to develop various diseases if they are exclusively fed on formula.

Some develop diabetes because of the high content of sugar in formula milk and lack of constantly changing enzymes only a mother's milk can provide. These infants become insulin dependent, making medical care costs for them range from \$1,185,900,000 to \$1,301,100,000 for both insured families and those paying out of pocket (USBC, n.d). Some forms of diabetes are reversible, but even then families that area already struggling to make ends meet with the current costs most likely won't be able to afford extra charges.

Mothers also receive health benefits when they choose to breast feed. It was been reported that mothers choosing to breast feed reduce their risk of contracting ovarian and breast cancer. When they breastfeed, their enzymes and dietary nutrients change based on the infant's needs. As the child gets older, the fat content of the milk is altered to fit the needs of the baby. Progressively, the enzymes allow for less milk clots forming in the breast tissue, reducing the risk of breast cancer. Ovarian cancer is reduced because, as the mother is breastfeeding, her hormone levels change making her less at risk. Not only does breast milk directly affect the mother and baby, in Mexican culture, it is believed that a mother's milk is good for earaches as well as other home remedies.

Table 2: Average yearly costs for a mother who chooses to breastfeed

Breastfeeding Costs					
Item	Quantity	per year	Price Range	Min Cost	Max Cost
Breast Pump	1/ year	1	\$70.99-324.99	\$70.99	\$324.99
Pump Accessories	1/ year	1	\$16.99-27.99	\$16.99	\$27.99
Bottle drying rack	1/ year	1	\$9.99-12.99	\$9.99	\$12.99
Bottle brush	1/ year	1	\$6.99-14.99	\$6.99	\$14.99
Storage bags	21/ week	1092	\$9.59-13.39	\$209.45	\$292.44
Nursing pillow	1/ year	1	\$10.99-59.99	\$19.99	\$59.99
Nursing breast pads	12/month	144	\$6.59-24.99	\$237.24	\$899.64
Nursing cover	1/ year	1	\$11.39-51.99	\$36.99	\$51.99
Total Cost				\$642.95	\$1,744.94

Environmental Effects

In a study done by registered nurse Sarah Brown Blake, a connection between contaminated drinking water sources and dairy farms based on their proximity to one another in the San Joaquin Valley was documented. The valley is one of the most productive agricultural areas in the nation, which entails an increasing number of low income farm-working families. Brown Blake found that 96% of the nitrate contaminants in water supplies came from the use of crop fertilizers as well as animal waste (2014). The concern here with nitrate contaminants is that diseases like colon and bladder cancer are linked to them, especially in areas where the contaminated water sources are the only source for potable water. Along with higher risks of cancer, contaminated water can cause newborns to have lower birth weights, neurological defects, as well as other diseases, and possibly even cause a miscarriage. Attempts to secure clean drinking water have been made, like the Clean Water Act of 1972 and Safe Drinking Water Act of 1974. Both of these acts were set in place to try to protect public health by regulating the contamination sources (Balazs et. al, 2011). These studies have only begun to scratch the surface of the water contamination problem. Though nitrate contaminates are linked to cancers, more needs to be done to clearly link

them to birth defects. The information found as of right now is preliminary and a hypothesis based on previous assumptions of the effects these contaminants may have.

Conclusion

After doing the initial research, I have found that benefits of breastfeeding extend to more than just health. The health of the mother and baby are better when compared to mothers and children who do not partake in breastfeeding. Mothers can prevent diseases like breast and ovarian cancer, while infants develop strong immune systems that will allow them to be stronger as they grow older. The health costs are significantly lower and money can be spent on other necessities like utilities. There is less time being spent in doctors' offices and, instead, that time can be spent creating inseparable bonds between mother and child. Environmentally, not much has been researched. The little information available only speaks of less trash and pollution with breastfeeding, but things like pollutants in water supplies or the effects of genetically modified food on the mothers and children is still an untapped section of this research. The idea is to take this information and apply it to current lifestyles and delve more deeply into the issues to increase our understanding of the effects of the environment on newborns.

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