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CHAPTER 2

Breastfeeding and Lactation: Roots and Wings

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► Introduction

Humans, like all other mammals, are born biologically adapted to species-specific milk as a complete source of nutrition. But lactation is more than nutrition alone; it is also a means of bonding, nurturing, and caring. The same hormones that drive milk letdown (oxytocin) and production (prolactin) enhance our parenting instincts for men as well as women. Both males and females secrete oxytocin and prolactin in response to parenting behaviors, but it is usually only females who go on to develop the biological capacity to lactate, beginning in adolescence and continuing through adulthood.

We think of the iconic early human mother as one with her nursing child by her side or carried in her arms—the sole mother, the sole parent caring for her young. This view really reflects our current cultural norms. In industrialized countries in particular, isolated nuclear families in which resources for childrearing may be provided only by the parents or, in some cases, a single parent, are common. Historically, this is a fairly new development. Humans, as with many primates and other mammals, are more traditionally raised with larger family units and with broader bonds of responsibility to the child. In many

contexts in which this shared care and responsibility for children occurred among humans and other species, it also included shared lactation (Hrdy, 2009). Shared lactation can be found among many mammals, such as meerkats and wolves, but in ethnographic descriptions of typical foraging cultures worldwide, shared lactation is described in 87% of the 64 cultures that have been studied (Hewlett, 1996). For example, cultures as widespread as the Ongee foragers off the coast of India, the Trobriand Islanders in the Pacific, and the Efe in Africa all engage in various forms of shared lactation (Hrdy, 2009).

Our evolution suggests that human culture is far from prescribed; rather, we are complex and adaptable, and this has led to an almost endless array of parenting styles and cultural norms around infant feeding and care. In our current culture, the right and ability of mothers to be consistently near her child are contentiously debated as societies argue over the value of motherhood and parenthood, biological nurturing, the social value of children, the rights of workers, and the role of the state in supporting families. The subtext to this conversation is the changing family. The parameters of this cultural flexibility are bracketed by the infant's adaptation to human milk and ability to thrive on substitutes to it on one side or the equation, and

our adaption of breastfeeding as an embodied form of caregiving, the value we place on nurturing, and the cultural expectations and needs of mothers and others on the other side.

Breastfeeding links nurturing to other roles and responsibilities that are typically assigned to women based on gender roles and expectations. As such, it presents a cultural challenge to women as they struggle to inhabit the embodiment of nourishing and nurturing their own child while balancing this with the increased freedoms introduced by adaptations—such as our social capacity to share in parenting and to share our food sources, including human milk and external sources of milk. We are also reexamining our assumptions, language, practices, and policies that reinforce the idea that breastfeeding—and, extending from that, caregiving and nurturing—is for some but not others based on their gender and sexuality. Seeking balance between the shared responsibility of tending to our young, the need for our young to receive all the components inherent in being fed at their mothers' breasts, and the challenge of caring for infants in a modern society informs our understanding of breastfeeding as it exists in the social fabric of our history and current times.

In this chapter, we will explore how this complex nurturing practice is shaped by looking at it from multiple vantage points. First, we will turn our attention to breastfeeding as an act of human parenting—how it reflects our biological norms and cultural expectations. We review the spectrum of nutrition and nurture, from embodied nursing through the use of supplemental feeds, the ability of the infant to grow and survive on human milk substitutes, and the cost of those substitutes to the health of the infant and the relational aspects of human milk feeding. We explore how changes in knowledge, development, women's status, and technology have shaped infant feeding practices and trends in breastfeeding. We report on a variety of policies at the global level and in the United States that shape our public health approach to breastfeeding and infant feeding trends. We conclude with a discussion of breastfeeding as an embodied, gendered, caregiving and nurturing practice, and we explore the “breastfeeding conundrum” that we are experiencing today. And, we offer suggestions for how to disrupt it.

Our story begins with an exploration of nursing and supplementation in its many forms over time, as our resources and access to scientific information have led us from nursing, to cow milk, to formulas, and back to breastfeeding with the addition of breast pumping and milk sharing (see **BOX 2-1**).

BOX 2-1 About Human Milk

Human milk is the perfect nutritional substrate for human growth. But it is much more than simply nutrients; the microbiome of mother and baby, shared and communicated across their two bodies, ever changing and adapting to their environment and moving information and knowledge from mother to child in the early days of breastfeeding, lays down and nourishes the microflora in the gastrointestinal tract and directly supplies information, in the form of immune factors, from the mother's immune system to her child's. The milk that a baby is fed is adapted to many unique conditions. For instance, milk for male infants has a higher fat content (Powe et al., 2010); cortisol levels are higher in mothers with fewer somatic resources, which could prioritize the nursing's caution and weight gain over time (Hinde et al., 2015); and milk fed at night has higher melatonin levels (Katzer et al., 2016) and lower cortisol and cortisone levels (Hinde et al., 2015). The mother's microbiome is directly transferred to the infant via breastmilk (Duranti et al., 2017), changing with the age of the child and the health of the mother (Witkowska-Zimny & Kaminska-El-Hassan, 2017). It has even been demonstrated that human milk carries pluripotent, self-renewing stem cells to the infant via breastmilk (Hassiotou et al., 2012). These specific forms of information from mother to child are disrupted as the child moves away from nursing directly at its mother's breast, reflecting the reality of two interdependent and physically linked biological processes that exist between and encompassing the nursing parent and child.

► Human Evolution: Shared Parenting and Lactation

Shared parenting, or the nurturing of our young by our families and communities, has always been a part of human nature not shared by all mammals, or even all primates. A less discussed and perhaps less accepted aspect of shared parenting is shared lactation. Shared lactation has always been present, although it has gone in and out of cultural acceptance as social mores have changed and as our relationship to our bodies, our breasts, and nursing itself has shifted. Despite the changing acceptance of shared lactation in the larger cultural context, within countless societies and throughout history, it might be a hidden undercurrent, a commodity, or an accepted part of daily life—but it has always been something that women

will do for each other in the right situation. Sarah Blaffer Hrdy, in *Mothers and Others*, noted that among hunter-gatherer cultures in which women are responsible for foraging for the survival of the group, there is immense social capital spent maintaining the egalitarian nature within the groups. Among these cultures, it is not uncommon for women to co-nurse children among lactating mothers so that milk is shared among families, similar to other resources (Hrdy, 2009).

As human culture evolved into higher density population centers with greater pressure for resources, hierarchical cultures developed. These class-based societal structures concentrated the distribution of resources in those at the top of the social structure over those in lower social strata. Shared parenting, as it was adopted in these class systems, optimized the fertility and flexibility of mothers with more resources over those with fewer resources. In lactation, this led to such practices as women from higher social strata fostering their children with servants, slaves, or wet nurses who were lactating, or hiring wet nurses into their homes. This practice allowed wealthy mothers to return to their previous social roles, including having another child more quickly. This can be seen in the birth records in England in the late 17th century, when women from the aristocracy were giving birth annually while working-class women gave birth closer to every 3 years (Campbell, 1989).

However, the use of replacement sources of milk is not limited to the aristocracy. As urbanization progressed, necessity drove working women to seek external sources of milk as well. During the industrial revolution, when more European families were moving to urban centers, the cost of living was so high that women went back to work shortly after their babies were born, necessitating shared parenting and the use of alternate sources of milk among working-class women. We see this same trend in current cultures as urbanization draws families into cities; both parents work outside the home because of financial necessity, requiring children to be left with others for care and feeding.

Wet Nurses

Wet nurses are used in cultures in which fresh or preserved sources of animal milks are not available. The quintessential wet nurse was the rural European woman employed by the wealthy or working urban woman who did not choose, or did not have the freedom, to nurse her own child in a time before the availability of fresh dairy. This form of wet-nursing was common throughout the early modern period

in Europe and America, peaking in the 1700s. But this is not the only time wet-nursing has been used for infant feeding. Wet-nursing-for-hire is mentioned in some of the oldest surviving texts, which implies that the practice was well established even in ancient times. The Babylonian Code of Hammurabi (c. 1700 BC) forbade a wet nurse to substitute a new infant for one who had died. The Old Testament Book of Exodus (Exodus 2:7–9; c. 1250 BC) records the hiring of a wet nurse for the foundling Moses (that the wet nurse was Moses's own mother is incidental). The epic poems of Homer, written down around 900 BC, contain references to wet nurses. A treatise on pediatric care in India, written during the second century AD, contains instructions on how to qualify a wet nurse when the mother could not provide milk. The Quran, set in written form about AD 500, permits parents to “give your children out to nurse” (and also forbade children nursed by the same woman to marry).

The history of wet-nursing has continued virtually unbroken from the earliest times to the present. In the most recent literature on breastfeeding, wet-nursing is considered, although cautiously, in emergency situations (United States Breastfeeding Committee, 2011; World Health Organization [WHO], 2004), in situations in which birth mothers suffer death or disease, and in adoptions (Wilson et al., 2015). In all cases in which wet-nursing is used as a form of infant sustenance, there is a risk to the infants. There is risk to the nursed child, or nursling, if the wet nurse has a transmittable disease (historically, syphilis, and, more recently, HIV); there is also a risk to the wet nurse's own infant because of the loss or degradation of their food source.

Historical records of wet-nursing demonstrate high infant mortality rates in both the biological child and the nursling. In cases in which infants lived in the wet nurse's home, mortality rates as high as 80% have been recorded for the fostered child. The historical records are full of accounts similar to the Dowager Countess of Lincoln, who had 18 children in the 1600s “reared” by wet nurses, and only one of whom survived to adulthood. The countess's daughter-in-law chose to nurse her own children. Rather than chastising her for the practice, her mother-in-law wrote a treatise imploring more mothers to suckle their own children rather than use the services of the wet nurse. She concluded with the following appeal: “. . . be not so unnatural as to thrust away your own children; be not so hardy as to venture a tender babe to a less tender breast; be not accessory to that disorder of causing a poorer woman to banish her own infant for the entertaining of a richer woman's child, as it were, bidding her to unlove her own to love yours” (Wickes, 1953b, p. 234).

If the infant of the wet nurse was sent away so that the nurser could live in the home of her charge, the chances of survival were better for the nursling but equally or even more dismal for the wet nurse's biological child, who was typically sent off for fostering or sustained by other family members on alternative food sources. This practice of banishing one's own child to receive payment for feeding another is well illustrated in a letter to a women's magazine by Fanny B. Workman in 1886. When the wet nurse arrived for her job interview with her own infant, Workman asked:

“Did you not understand that you were to leave your baby?” The woman quickly agreed to “place out” her baby and accepted the job. Two weeks later the new wet nurse received a telegram informing her of her baby's death. Frantic with grief, she prepared to attend the funeral. An irate Workman complained, “I decided that would never do. . . . After an hour or two spent in argument I prevailed upon her to not go to the funeral.” (Wolf, 2001, p. 142)

A variety of efforts were made to protect the children of wet nurses and the children being wet-nursed. France regulated the practice through the institution of the Bureau of Wet Nurses (1769–1876), the medical community in Germany united in disapproval of wet-nursing during the same time period, and many doctors refused to assist in the provision of wet nurses. In Maryland, in 1916, a law was passed forbidding the separation of mothers and infants for the first 6 months of life in an effort to discourage the practice (Wolf, 2001).

Nowhere is the power structure inherent in wet-nursing as evident as it is in slave cultures in which slave owners control everything while those in bondage own nothing—not even their own fertility or bodies. In the slave-owning southern United States, wet-nursing by female slaves was relatively common, and the historical record gives us some insight into this particularly exploitative form of wet-nursing practiced in many locations around the world. During the 1800s, although the use of animal milks was becoming more popular in urban areas, for rural slave-owning families, it was easier to assign a slave to nurse the owner's children than to bottle-feed. During slavery, the survival of the slave's infant had monetary value, so the master's child was often added to the slave's child at the breast, rather than risking the health of the enslaved infant by taking him from the breast early. In other cases, babies of slaves were taken away from some mothers who were sent back to the fields and given to already nursing mothers to maximize the labor pool and fertility among the slave population. In this extreme example

of commodification of human milk, parenting and nurture are denigrated to insignificance, and nurture is stripped to its most basic caloric potential. It is a testament to human nature that even in these stark circumstances, there are also stories of shared nursing in which slaves and mistresses, or slaves among themselves, share in nursing each other's babies while working toward a shared goal, such as cooking a meal (West & Knight, 2017). “My mother used to be a cook, and when she was busy cooking, my mistress would nurse both me and her baby, who was four weeks older than me. If it happened the other way around, my mother would nurse both of us” (Rawick, 1979, p. 287).

Animal Milks

To share or purchase human milk requires expending social capital, whether that is monetary or part of a relationship. Within this framework, use of animal milks can be seen as a form of societal freedom, requiring less capital than the use of wet nurses. But the use of animal milks presents several difficulties that must be overcome. First, the milk must be kept fresh and the quality maintained from the source to the infant. Second, the vessel for delivering the milk to the baby must allow a baby to suckle while also being easy to keep clean. Third, and most difficult to overcome, is that of ensuring good nutrition: Animal milks can be difficult to digest and do not provide all the nutrients, and certainly not the immune properties, available to human infants from human milk. The history of the use of animal milks for infants, up to and including the present day, is full of negative outcomes to infant health inherent in its use. These can be seen in the innovations employed to improve the product and in the commercial practices meant to maximize profits from its sale. But we didn't always use animal milks as an independent product—our use of animal milks began with the use of animals as wet nurses, rather than the use of animal milk taken from the animal and given to the baby via a vessel.

The earliest use of animals as wet nurses is difficult to determine; however, references to its use are present in the Quran, in which the practice is discouraged, and in the Talmud, which permits the use of animals as wet nurses when the welfare of the child is at stake. Greek mythology is also full of stories of humans being nursed by a variety of animals, the best known being the mythical founders of Rome, Romulus and Remus, who were fed by a wolf. Agricultural societies brought with them the close proximity of farm animals; as recently as the 19th century, using such animals as goats or donkeys as wet nurses was culturally accepted, and even institutionalized. In hospitals and homes for



FIGURE 2-1 Infants in a Foundling Hospital Being Fed with Animal Wet Nurses.

Courtesy of SH Sadler.

foundlings, the animals were kept in close proximity, and infants were brought to the animals' stalls to suckle directly at their teats (**FIGURE 2-1**). This practice may have been more sanitary than the alternatives during a time when there was no refrigeration, water for washing was not easily accessible, and the snouted vessels used to feed infants were difficult to keep clean (Valenze, 2011). A variety of animals were used for this purpose, but goats and donkeys were thought to be the closest to human milk because the size of the curd produced was smaller (Weinberg, 1993).

In comparison to using an animal as a wet nurse, the use of an animal as a source of milk did not require the infant to remain in proximity to the animals. The use of purchased animal milk or hand feeding infants nonmilk substances required access only to the product. Given the complexity and cost of obtaining wet nurses, be they human or animal, it is not surprising that dairy was also used as a substitute for human milk, particularly as families moved to urban centers. During industrialization, whether historical or current, families are drawn away from farms and into cities, where women need to work outside the home to contribute to the family's financial stability. This requires shared parenting or child care, and alternative sources of nutrition, such as milk or other supplemental foods, for infants at an early age. Shared parenting is well within the realm of common human behavior. In fact, prelacteal feeds—or the supplementation of colostrum in the very early days after birth, which is inherent in many cultures around the world—are uniquely adapted to maximize this human potential.

Prelacteal Feeds

Biologically, we produce oxytocin when we eat, causing us to form social ties with those with whom we share a meal. The definition of family has always incorporated meal sharing, from our earliest human

ancestors to our most progressive alternative definitions of family. The knowledge that a mother's own milk is best for her baby has been present as far back as there has been choice about what to feed an infant. But there has also been a persistent drive to feed infants other substances from early in their lives by mothers and others.

Examples of prelacteal feeds are so pervasive as to be difficult to define as atypical, but the way the ritual is performed can be different. Of 120 traditional societies (and, by inference, many ancient preliterate societies) whose neonatal feeding practices have been described, 50 delay the initial breastfeeding more than 2 days, and some 50 others delay it 1 to 2 days. In India, as many as 88% of women give prelacteal feeds mostly because they believe colostrum is harmful or of poor nutritional value (Raina et al., 2012). Early medical writers in the eastern Mediterranean region (Greece, Rome, Asia Minor, and Arabia) and later in Europe—from Soranus through the authors of the 1600s—also discouraged the use of colostrum for feeding. These writers recommended avoiding breastfeeding for periods as short as 1 day (Avicenna, c. AD 1000) to as long as 3 weeks (Soranus, c. AD 100). Commonly, to promote the passage of meconium, the newborn was first given a “cleansing” food, such as honey, sweet oils (e.g., almond), or sweetened water or wine.

A modern version of this practice can be seen in the prelacteal bottle feeds commonly given in Western (or Western-style) hospital nurseries and neonatal intensive care units (NICUs). Ostensibly these practices allow staff to check for esophageal patency and to protect against hypoglycemia. Despite the lack of evidence to support these practices, they were common until very recently and are still being practiced in some hospitals today. The reasons for prelacteal feeds vary and are rarely evidence based; however, the practice may actually serve other purposes, such as providing an opportunity to expand the circle of care that a child will receive by giving others access to the mother and child while they are still experiencing high levels of important bonding hormones (oxytocin, prolactin, beta-endorphins). When early prelacteal feeds are viewed through the lens of shared parenting, it is not surprising that many cultures have prioritized others feeding the baby during this time, nor is it surprising that formula companies have prioritized marketing to mothers during this early bonding period.

However, there is a balance between the social benefit of shared parenting and the cost to the infant of receiving alternative sources of nutrition. Each day's delay in initiation of breastfeeding steadily increases the likelihood of neonatal death from infection (Edmond et al., 2007), and any food introduced

into the infant's immature gastrointestinal tract can alter the delicate integrity of the microflora that would otherwise be a system protected by exposure to only the mother's milk. For the mother, reduced breast stimulation can decrease her capacity to produce sufficient milk later on and undermine her confidence in her ability to provide for her child.

Prelacteal feeds are not the only form of supplemental nutrition given to babies. All babies transition to adult sources of food; it is the timing that has been a source of debate. Our current view comes from the scientific evidence suggesting that 6 months of exclusive breastfeeding reduces the risk of infant morbidity and mortality (WHO, 2004), but we have not always had the same measure of certainty. Early or "hand-fed" foods have been, and continue to be, used much earlier than 6 months and can include tea infusions, mashed fruits, and a variety of starchy gruels or pastes. Early Europeans used paps or peplums consisting of stale bread mixed with broth, milk, or even beer and stronger alcohols (Wickes, 1953a). However, it was not until the rise of the dairy industry and the development and aggressive marketing of formula that breastfeeding reached record-low levels in countries all over the world—particularly where there was industrialization.

The Rise of Formula

The rise in the use of formula started with an increased dependence on unaltered dairy for infant feeding and followed a trajectory similar to wet-nursing. Specifically, the use of alternatives to nursing started with wealthy women who insisted on being free from the burdens of parenting. The use of supplemental milk became associated with wealth, and families with lower incomes seeking upward mobility or outward symbols of prosperity took on the practice. As countries prospered, they were more able to support urban centers, and as families moved to urban centers, women's social latitude expanded. Often women needed or desired to work outside the home while their children were still young. This expansion in the choices or expectations of women's roles as workers pushes against embodied nurturing, such that breastfeeding may be deprioritized or abandoned out of need or desire. When poor feeding strategies are compensated for by high-resource parenting, the negative results might be less obvious; however, the widespread move away from human milk has caused spikes in infant morbidity and mortality in the population statistics as a whole, particularly when the use of formula is normalized and shortcuts are taken out of necessity or

ease. The rise in infant mortality and morbidity has caused state, professional, and civic organizations to intervene with public health messaging, funding for interventions, and scientific inquiry in order to promote improved ways to feed infants and young children. We can see this pattern, historically and globally, with all breastfeeding substitutes—from wet-nursing, to dairy, to formula—as countries rise out of poverty in the presence of normalized alternatives to nursing: First they are adapted by the wealthy and then they become normalized among working women, causing infant mortality rates to rise.

Historically, formula use is inextricably linked with the rapid pace of change in technology, communication, and the medical system in the late 19th and early 20th centuries, when it was first developed. These changes included the increased reach of media; the rise of Western, hospital-based, allopathic medical systems; the scientific exploration of human nutrition; and the technology used to produce, transport, and feed infants. During this time, patents were awarded for the invention of refrigerated boxcars, and then home refrigerators, which facilitated transport and storage of dairy and other perishable goods; an upright bottle with a rubber nipple, which made feeding liquids to babies much easier and safer because they were easier to keep clean than the snouted pots used previously; breast pumps that were originally complicated modifications of pumps for cows but that, over the years, became gentler on women's breasts and easier to use; and condensed and powdered milk products. Dairy products were originally used by themselves or as part of recipes given to mothers to make infant food; eventually, they were modified to produce formulas, making dairy-based foods easier for the infant to tolerate (**FIGURE 2-2**). The printing press was developed much earlier, but it was during this same period that mechanization allowed for mass marketing of cheap periodicals with advertising and books on child-rearing.

Perhaps the most influential change in our progression from breastfeeding to formula feeding involved the acceptance of medical management for childbirth and child-rearing. During the 19th and 20th centuries, in developed countries, there was a move away from female healers, midwives, and home-centered health care to male physicians and hospital-based practices for birth and the immediate postpartum period (Starr, 1982). This trend can be seen in the United States beginning in 1900, when all births occurred in the home. By 1950, 88% were hospital births, and by 1960, almost no one was giving birth at home (Devitt, 1979). This same movement can be seen as countries develop and urbanize around the world.

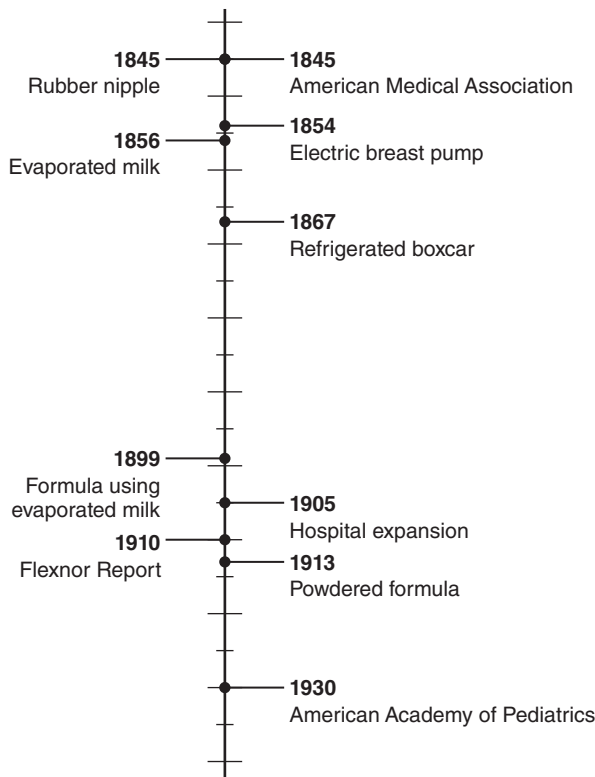


FIGURE 2-2 Historical Timeline Illustrating Some of the Important Patents and Medical Events That May Have Contributed to the Progression to Formula Feeding.

One way to understand this shift in healthcare practice is through the concept of authoritative knowledge (Jordan, 2014). This theoretical framework suggests that “within any particular domain several knowledge systems exist, some of which, by consensus, come to carry more weight than others, either because they explain the state of the world better for the purposes at hand (‘efficacy’) or because they are associated with a stronger power base (‘structural superiority’), and usually both” (Jordan, 1997, p. 56). When there is ascendance of one kind of knowledge, the result is a devaluing or dismissiveness of other forms of knowledge. This social process evolves around societal power relationships and community practices. Our current Western medical system solidified its power base with the Flexner Report, a review and elimination of many of the existing medical schools in the United States by the American Medical Association and the Carnegie Foundation in 1910. Authoritative knowledge of the time included a *scientific approach* to scheduled, infrequent feedings; the use of dairy-based products, such as milk and formula; and a move toward hospital-based, medicalized births. Although this process from traditional breastfeeding to scientific formula feeding was particularly acute in the early 20th century in the United States, it also

occurs, to varying degrees, in developed and developing countries around the world as scientific medicine gains precedence over local healers.

In the United States, this process was evidenced by the rise of pediatrics and obstetrics. Midwifery was actively discouraged; licensing laws were used that made it difficult for midwives to practice (Starr, 1982), and media campaigns aggressively slandered midwifery care (Devitt, 1979). As midwifery declined in favor of modern, scientifically driven medical care, so did breastfeeding. The practices of the day were fueled by the belief that science could provide answers and that “the combined efforts of the cow and the ingenuity of man” could construct a food that was equal to human milk (Gerrard, 1974). This confidence in science over nature drove breastfeeding rates down as doctors normalized the use of formula as a medical intervention. For example, physician Thomas Rotch developed a complex system for modifying cow milk so that it “more closely resembled human milk.” He observed that the composition of human milk varies, as do digestive capacities in infants. He devised mathematical formulas to denote the proportions of fat, sugar, and protein he believed infants required at different ages (Rotch, 1907). The result was an exceedingly complex system of feeding that required constant intervention by the physician, who often changed the “formula” weekly. Supervising infant feeding was thus a principal focus of the newly emerging specialty of pediatrics, inextricably linking it to the scientification of milk, scheduled and controlled feeding regimens, and the increasing use of formula.

During the 20th century in the United States and other Western countries where hospital birth was becoming the norm, bottle-feeding by nursery staff became common. Postpartum hospital stays in the United States lengthened during the 1930s and 1940s to as long as 2 weeks in order to support women as they recuperated from highly medicated childbirth experiences. Mothers were separated from their infants and their families and friends (in part because of the fear of infection) and attended, in their place, by hospital staff. This separation of mother, infant, and family effectively eliminated the possibility of parallel ideology by completely controlling access to the birthing suite, excluding everyone except those in the medical system. During the early hours of high oxytocin and bonding after birth, the mother had the hospital staff, rather than her baby and her community, at her side. This meant that women were returning home with an impaired milk supply, a baby who was accustomed to feeding from bottle nipples, and a mother disconnected from her community and bonded with the hospital and the medical system as a

source of support, making it far too late to effectively initiate breastfeeding. As long ago as the mid-1940s, Bain noted that babies who were older than 8 days at discharge were less apt to be breastfed than babies who were younger at discharge (Bain, 1948).

Scheduled Feeding

It was no wonder that women giving birth in hospital settings had low breastfeeding self-efficacy and insufficient production. But even before the advent of hospital births, women's belief in their ability to produce enough milk for their babies was deteriorating as wealthy women, then urban women, turned to medical advice and the latest scientific discoveries to guide their infant care. It was not that the push to timed and proportioned feedings was a new idea; early medical writers, even those who strongly recommended breastfeeding, also recommended regulated times for feedings. This type of thinking may have originated as early as the 1500s in Europe. At this time, overfeeding was thought to be a primary cause for gastrointestinal discomfort, diarrhea, and death, leading to recommendations to regulate or reduce infant feedings. This one, from the mid-1600s, states, "Nothing is more apt to disorder the child than suckling it too often, since large quantities of milk stagnating in the stomach, must need corrupt . . . especially if fresh milk be pour'd in before the preceding be digested" (Ettmuller, 1703, cited in Wickes, 1953c, p. 332). Ettmuller's firm endorsement of breastfeeding and largely sound advice prompted many privileged English women to breastfeed, yet he too advocated only four feeds a day at equal intervals, and no night feeds.

While medical men were encouraging infrequent feeds, until the late 1800s and early 1900s, this advice was given in the presence of parallel models of care. This is seen in this lament by Rotch, who in 1907 deplored that when it came to infant feeding, "mothers and nurses . . . dominated the physicians" (Rotch, 1907, p. 55). But as the medical model of care became the authoritative knowledge of the day, mothers were pressured to implement scheduled feedings, and schedules were prioritized over feeding a baby according to hunger cues. Wolf (2001) proposed that it was the scheduling of feedings that caused low milk production, or the perception of low milk production, as women moved away from reading infant cues and toward watching the clock. The biological reality of human milk production, which in hunter-gatherer societies constitutes feeding multiple times in an hour (Konner, 2005), was just not up to the level of scheduling implemented by women as they tried to satisfy both the baby and the physician. As a result,

breastfeeding "failed," and dairy products, then formula, were used by women to compensate for their insufficiency.

The Problem with Dairy

The formulas of today, despite their long- and short-term health consequences, are far more palatable than the dairy products that were first introduced to infants. One of the difficulties with any dairy product, today or earlier in our history, is that when milk is removed from the animal, it becomes a commodity. Like any other commodity, it needs to be produced, shipped to market, and sold to a customer before it reaches the infant. Although this process creates a product that is easily accessible to families, particularly in urban centers, it also exposes the milk to many sets of hands. Although some infants survived the ingestion of unaltered dairy, particularly children of wealthy women who could pay for extra precautions, the distance from source to infant allowed for carelessness, ignorance, and the market economy to negatively impact the quality of milk purchased for infants. This resulted in extremely high infant mortality rates during the mid- to late 1800s, when the rate of dairy milk replacement of breastfeeding was rapidly increasing. For instance, in Chicago in 1897, 5 years after high rates of infant mortality were attributed to the city's unsanitary cow milk, 18% of infants in the city were dying before their first birthday. Of these, 54% of the deaths were caused by diarrhea (Wolf, 2001).

Milk quality was vulnerable to degradation at every level of production. Cows were often fed on the by-product of breweries, introducing alcohol into the milk produced. This milk, called "swill milk," could be purchased at much lower prices than "country milk," which was milk from cows fed a standard grain diet (Wolf, 2001). When milk was shipped, dairymen were notorious for diluting it with water, then adding chalk to make it appear creamier. This was so prevalent in London that when farmers sold donkey milk, which was much more expensive than cow milk, the animal itself was brought to the home and milked at the doorstep to verify that it wasn't being altered (Weinberg, 1993). Refrigerated boxcars, first patented in 1867, made the transport of milk from the dairy to urban centers safer. Before that, however, milk was often transported in open train cars; as a result, the milk arrived at its destination full of bacteria and other contaminants, particularly in the summer months. Public health campaigns called Milk Public Health Crusades were aimed at cleaning up and regulating the dairy industry. These campaigns were the topic of newspaper stories and fliers through much of the early 1900s in

the United States. The language of the crusades was incendiary, such as this rhyme on a Chicago Department of Health poster:

“Bye Baby Bunting
Healthman’s gone a hunting
To get the dirty milkman’s skin
And save the Baby’s life for him.
Is your milkman a friend or an enemy of
your baby?
If you don’t know ask the Health Department.”
(Bulletin Chicago School of Sanitary Instruction, 25 April 1914, figure 5, p. 55 as cited in Wolf, 2001)

Yet despite the voracity of these media efforts equating poor sanitation in the dairy industry to the death of infants, it still took decades for farmers to test cattle for tuberculosis and to seal, bottle, pasteurize, and keep milk cold during shipping (Wolf, 2001).

The Rise of Formula in Medicine

Unfortunately, once safety in the dairy industry improved, the use of dairy and formula grew. Infants were surviving on formula, which led to a generalized complacency and even acceptance and recommendation of formulas over breastmilk. Use of formula as a medical intervention was normalized, and it came to be seen as the nutritional equal of human milk. Strong medical recommendations for formula lasted until the 1970s; however, even today, dependence on formula is still a part of our cultural and medical rhetoric. Breastfeeding statistics during this period illustrate how rapidly this transition occurred. In the United States in 1917, 82% to 92% of women were exclusively breastfeeding their babies at 1 month. The rate dropped to 38% at hospital discharge in 1948 and to 21% in 1957 (Apple, 1987). Multiple forces were at work in equating formula to human milk. Within the medical field, it was no longer common for babies to die because their mothers were feeding them formula, so young doctors grew into the field without the same drive to support breastfeeding that some of their older colleagues had. The studies of the day were designed to demonstrate an equality between modes of feeding, and prestigious medical journals published research indicating that it was physician supervision or social status that positively affected the health of infants rather than what they were fed (Garland & Rich, 1930; Glazier, 1930). As a “safe” alternative to breastfeeding, formula was simpler to assess and control and could be used any time a problem with breastfeeding occurred. Knowledge about human milk and how to

support breastfeeding women faded from the curricula of medical and nursing schools and was replaced with the visible, controllable calculations used to manage formula feeding.

Formula Marketing

The developments in the previous section were coupled with aggressive marketing practices by formula companies directly targeting physicians (Greer & Apple, 1991). These practices included sales representatives posing as medical experts on feeding and ingratiating themselves with physicians, giving lavish gifts in exchange for time and attention to their sales pitches (Wolf, 2001). Infant feeding curricula in medical schools was even taught by formula companies, who would potentially spend as much as \$10,000 on each medical student during the student’s education (Walker, 2007).

Although the gifts might be smaller, these practices are still in use by formula companies today (Fortin, 2007; Tanovic, 2014). In the United States, the symbiotic relationship between formula companies and physicians is demonstrated by the practice of removing instructions for use from formula cans in the 1930s, replacing them with a message to consult a physician for use. This necessitated a pediatric visit in order to feed the baby, which worked well to promote the growing medical specialty of pediatrics. In addition, advertisements such as the following were placed by formula manufacturers in medical journals:

When mothers in America feed their babies by lay advice, the control of your pediatric cases passes out of your hands, Doctor. Our interest in this important phase of medical economics springs, not from any motives of altruism, philanthropy, or paternalism, but rather from a spirit of enlightened self-interest and cooperation because (our) infant diet materials are advertised only to you, never to the public. (Mead Johnson, 1930)

As Western markets became saturated, formula companies aggressively targeted developing countries to maintain market growth, which had a devastating effect on the lives of infants in areas that could not sustain safe use of dehydrated formula products. In developed countries, the derailing of breastfeeding in hospital settings meant that women bought more formula. In developing countries, women went home, having lost their breastfeeding relationship, to a setting in which their family might not be able to afford to purchase more formula, or where water was not safe for reconstituting formula. The result was a steep

rise in infant mortality rates in these resource-poor countries.

In 1974, a publication called *The Baby Killer*, by Mike Muller and the British organization War on Want, reported on the harm done to infant health and survival that was due to the way infant formula was marketed and distributed in developing countries (Muller, 1974). Although this was not the first time this form of “commerciogenic malnutrition” (Jelliffe, 1971) was identified, *The Baby Killer* drew global attention to the reality that:

Third World babies are dying because their mothers bottle feed them with Western style infant milk. Many that do not die are drawn into a vicious cycle of malnutrition and disease that will leave them physically and intellectually stunted for life. The frightening fact is that this suffering is avoidable. The remedy is available to all but the small minority of mothers who cannot breast feed. Because mothers’ milk is accepted by all to be the best food for any baby under six months old. Although even the baby food industry agrees that this is correct, more and more Third World mothers are turning to artificial foods during the first few months of their babies’ lives. In the squalor and poverty of the new cities of Africa, Asia, and Latin America the decision is often fatal. The baby food industry stands accused of promoting their products in communities which cannot use them properly; of using advertising, sales girls dressed up in nurses uniforms, give away samples and free gift gimmicks that persuade mothers to give up breast feeding. (Muller, 1974, p. 1)

A Public Health Approach to Breastfeeding: A Framework for Action

It was within this milieu that the most recent public health efforts began to take shape in the early 1970s. The complete recent history of a public health approach to breastfeeding protection, promotion, and support would be impossible to recount in this chapter, but we want to highlight key actions taken globally and in the United States to respond to concerns over the rise of infant formula and the decline of breastfeeding around the world.

Policy in the Global Arena

In 1974, national representatives from the 194-member states of the World Health Assembly, the decision-making body of the WHO, approved a resolution on

Infant Nutrition and Breastfeeding (World Health Assembly, 1974). The resolution, which *reaffirmed* that “breastfeeding has proved to be the most appropriate and successful nutritional solution,” *noted* “the general decline in breastfeeding related to sociocultural and environmental factors, including the mistaken idea caused by misleading sales promotion that breastfeeding is inferior to feeding with manufactured breast milk substitutes”; *observed* “that this decline is one of the factors contributing to infant mortality and malnutrition, particularly in the developing world”; *called the attention* “of countries to the necessity of taking adequate social measures for mothers working away from their homes during the lactation period”; *urged* countries to “review sales promotion activities on baby foods”; and *urged* the Director-General of the United Nations to “intensify activities relevant to the promotion of breastfeeding, to bring those matters to the notice of the medical profession and health administrators and to emphasize the need for health personnel, mothers and the general public to be educated.”

Growing awareness of the harm of infant formula led to a consumer boycott against the Nestlé corporation for the way it marketed and distributed infant formula in developing countries. The boycott, which started in 1977, garnered global support; as the boycott spread, concern over the harm being done to children around the world by the displacement of breastfeeding with infant formula extended beyond the breastfeeding community and into the lives of the everyday consumer. In 1978, Dr. Michael Latham, then professor of nutrition at Cornell University, spoke to the Governing Board of the National Council of Churches, encouraging them to support the Nestle boycott. In his talk, he said,

I may sound emotional about this issue and I do not seek to hide my emotions. I have strong feelings because I have frequently seen babies die unnecessarily because they were bottle fed, babies that would have lived to become useful world citizens had they been breastfed. I have shared the grief of sorrow of their mothers and have felt great frustration at not being able to do more to prevent needless sickness and death. (Latham, 2003, p. 51)

The National Council of Churches voted in November 1978 to support the boycott. As reported in the *Washington Post* at the time,

Church leaders have maintained that promotional practices of formula manufacturers seek to convince mothers in the Third World that

their babies will fare better if they substitute the formula for breast feeding. A Nestle vice president told the NCC governing board that “Nestle is not involved in aggressive promotion of infant formula anywhere in the world.” Church groups argue that the following items militate against promotion of formula sales in Third World countries: Primitive conditions of sanitation and storage. Inability of mothers to read and follow directions for preparation of formula. The cost to low-income families of a nutrient generally considered inferior to breast milk. (Hyer, 1978)

On the heels of the boycott, the World Health Assembly hosted an international meeting on infant and young child feeding that was attended by close to 150 leaders from government, the private and public sectors, and scientists. At this 1979 meeting, discussions focused on “the encouragement and support of breast-feeding; the promotion and support of appropriate and timely complementary feeding (weaning) practices with the use of local food resources; the strengthening of education, training and information on infant and young child feeding; the promotion of the health and social status of women in relation to infant and young child health and feeding; and the appropriate marketing and distribution of breast-milk substitutes” (WHO, 1981, pp. 4–5). A key outcome from this meeting was the adoption of the International Code of Marketing of Breast Milk Substitutes by the World Health Assembly in 1981 (see **BOX 2-2**). The Code aims to “contribute to the provision of safe and adequate nutrition for infants, by the protection and promotion of breast-feeding, and by ensuring the proper use of breast-milk substitutes, when these are necessary, on the basis of adequate information and through appropriate marketing and distribution” (WHO, 1981, p. 8). The Code, passed by a vote of 118 to 1 (the United States cast the sole dissenting vote), permits the availability of manufactured baby milk products but forbids advertisement or free distribution directly to consumers.

In 1990, the WHO and the United Nations International Children’s Emergency Fund (UNICEF) were instrumental in the development of the Innocenti Declaration on the Protection, Promotion and Support of Breastfeeding, which restated the importance of breastfeeding for maternal and child health. It set forth four goals to be met by 1995: (1) the establishment of national breastfeeding coordinators and a national breastfeeding committee, (2) the practice of Ten Steps to Successful Breastfeeding by maternity

BOX 2-2 WHO Code of Marketing of Breast-Milk Substitutes

- No advertising of these products to the public.
- No free samples to mothers.
- No promotion of products in healthcare facilities.
- No company mothercraft nurses to advise mothers.
- No gifts or personal samples to health workers.
- No words or pictures idealizing artificial feeding, including pictures of infants, on the products.
- Information to health workers should be scientific and factual.
- All information on artificial feeding, including the labels, should explain the benefits of breastfeeding, and the costs and hazards associated with artificial feeding.
- Unsuitable products, such as condensed milk, should not be promoted for babies.
- All products should be of a high quality and take into account the climatic and storage conditions of the country where they are used.

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International code of marketing of breast-milk substitutes. 1981. Available at: <http://www.who.int/nutrition/publications/infantfeeding/9241541601/en/>. Accessed March 1, 2018.

services (see **BOX 2-3**), (3) the implementation of the WHO International Code of Marketing of Breast-milk Substitutes, and (4) enactment of enforceable laws for protecting the breastfeeding rights of employed women (UNICEF, 1990). This declaration was signed by 30 countries, including the United States. In 1991, the WHO and UNICEF launched the Baby-Friendly Hospital Initiative (BFHI) to encourage specific birth-center practices in all countries that promote exclusive breastfeeding. To be designated “Baby-Friendly,” a hospital must demonstrate to an external review board that it practices each of the 10 steps to successful breastfeeding outlined in the Innocenti Declaration.

In the next decade, the WHO and UNICEF jointly developed the Global Strategy for Infant and Young Child Feeding to “revitalize world attention to the impact that feeding practices have on the nutritional status, growth and development, health, and thus the very survival of infants and young children” (WHO, 2003, p. v). The strategy, the result of a 2-year participatory process, reaffirmed a global commitment to the International Code of Marketing of Breast-milk Substitutes, the Innocenti Declaration, and the Baby-Friendly Hospital Initiative. The global strategy sought to provide a framework “for linking synergistically the contributions of multiple programme areas, including nutrition, child health and development,

BOX 2-3 Ten Steps to Successful Breastfeeding**Critical management procedures**

- 1a. Comply fully with the International Code of Marketing of Breast-milk Substitutes and relevant World Health Assembly resolutions.
- 1b. Have a written infant feeding policy that is routinely communicated to staff and parents.
- 1c. Establish ongoing monitoring and data-management systems.
2. Ensure that staff have sufficient knowledge, competence, and skills to support breastfeeding.

Key clinical practices

3. Discuss the importance and management of breastfeeding with pregnant women and their families.
4. Facilitate immediate and uninterrupted skin-to-skin contact and support mothers to initiate breastfeeding as soon as possible after birth.
5. Support mothers to initiate and maintain breastfeeding and manage common difficulties.
6. Do not provide breastfed newborns any food or fluids other than breast milk unless medically indicated.
7. Enable mothers and their infants to remain together and to practice rooming-in 24 hours a day.
8. Support mothers to recognize and respond to their infants' cues for feeding.
9. Counsel mothers on the use and risks of feeding bottles, teats, and pacifiers.
10. Coordinate discharge so that parents and their infants have timely access to ongoing support and care.

Reprinted from World Health Organization. Baby-Friendly Hospital Initiative: ten steps to successful breastfeeding revised. 2018. Available at: <http://www.who.int/nutrition/bfhi/ten-steps/en/>. Accessed October 1, 2018.

and maternal and reproductive health” (WHO, 2003 p. 25). Notably, the global strategy called for actions to address HIV and the needs of children and families in emergency situations. Key actions called for included the following:

- All governments should develop and implement a comprehensive policy on infant and young child feeding in the context of national policies for nutrition, child and reproductive health, and poverty reduction.
- All mothers should have access to skilled support to initiate and sustain exclusive breastfeeding for 6 months and ensure the timely introduction of adequate and safe complementary foods with continued breastfeeding up to 2 years or beyond.

- Health workers should be empowered to provide effective feeding counseling and to have their services be extended in the community by trained lay or peer counselors.
- Governments should review progress in national implementation of the International Code of Marketing of Breast-milk Substitutes and consider new legislation or additional measures as needed to protect families from adverse commercial influences.
- Governments should enact imaginative legislation protecting the breastfeeding rights of working women and establishing means for its enforcement in accordance with international labor standards.

Today, new energy is coming from the growing recognition of the important ways that breastfeeding contributes to the global effort to tackle poverty, inequality, and climate change, as reflected by the Millennium Development Goals (MDG) (United Nations, 2015a) and the Sustainable Development Goals (SDG) (United Nations, 2015b). The Millennium Development Goals, set forth by the United Nations as goals for 2015, were to (1) eradicate extreme poverty and hunger; (2) achieve universal primary education; (3) promote gender equality and empower women; (4) reduce child mortality; (5) improve maternal health; (6) combat HIV/AIDS, malaria, and other diseases; (7) ensure environmental sustainability; and (8) develop a global partnership for development. Following this, in 2012, UNICEF and the governments of Ethiopia, India, and the United States came together to plot a strategic pathway to achieve goals 4 and 5. In response, nearly “180 governments and hundreds of civil society and faith-based organizations rallied around this ambitious new goal for child survival, pledging to accelerate efforts to stop mothers and children from dying of preventable causes.” This commitment was outlined in the document *Ending Preventable Maternal, Newborn and Child Deaths: A Promise Renewed*. *Promise Renewed* recognized breastfeeding as one “intervention” during the postnatal period that could help reduce neonatal morbidity and mortality. The document noted that scientific evidence is building that early breastfeeding initiation is valuable in reducing infant mortality. It does so by preventing hypothermia and strengthening the baby’s immune system through colostrum (the mother’s milk during the first days after birth). It also helps establish the bond between mother and child. Much more must be done to promote this practice. In most regions of the world, fewer than half of all newborns are put to the breast within 1 hour of birth (UNICEF, 2012, p. 20).

In 2015, building on the momentum of the MDGs, the United Nations set forth *Transforming Our World: The 2030 Agenda for Sustainable Development*. This ambitious agenda is a

plan of action for people, planet and prosperity. . . . All countries and all stakeholders, acting in collaborative partnership, will implement this plan. We are resolved to free the human race from the tyranny of poverty and want and to heal and secure our planet. We are determined to take the bold and transformative steps which are urgently needed to shift the world onto a sustainable and resilient path. (United Nations, 2015a)

Although the SDGs do not highlight breastfeeding per se, the WHO and UNICEF issued a joint message for World Breastfeeding Week (WBW) in 2016, identifying how breastfeeding links to each SDG (World Breastfeeding Week, 2016). Beginning with the 2016 WBW, the World Alliance for Breastfeeding Action launched a long-term campaign to focus each subsequent WBW on a different SDG (World Alliance for Breastfeeding Action, 2016; World Breastfeeding Week, 2016). In some cases, breastfeeding can help advance a goal (e.g., improving health, reducing climate change). For example, breastfeeding contributes to a healthy planet because its lower ecological footprint, compared with infant formula, reduces the use of water, energy, paper, and metal. In other cases, the advancement of the SDG may make it easier for women to breastfeed by, for example, reducing gender inequality, income inequality, and poverty (World Breastfeeding Week, 2016). These potential synergies present the breastfeeding community with exciting opportunities for policy, practice, and research collaborations.

► United States Policy

In 1984, 3 years after the adoption of the International Code of Marketing, the first U.S. Surgeon General's Workshop on Breastfeeding and Human Lactation was held. As summarized by C. Everett Koop, then surgeon general, this workshop identified a framework for public health action for the "promotion of breastfeeding in the continuum of maternal and infant care" (USDHHS, 1984) This framework included establishing breastfeeding as the norm; promoting universal education (for professionals and the public); addressing problems in the workplace; and developing a continuum of postpartum care and adoption by

public health agencies of breastfeeding as standard practice. However, the key elements identified by the workshop were more tightly focused on improving the continuum of care in healthcare settings, inclusive of primary care, prenatal care, hospital care, and postpartum ambulatory care.

Given that the United States was the one country that did not sign the Code, it is not surprising that the recommendations from this workshop did not include any reference to monitoring or addressing the marketing of infant formula. Surgeon General Koop established two task forces in November 1981 in response to the controversy over the International Code of Marketing of Breast-milk Substitutes. A Public Health Service Task Force on the assessment of scientific evidence related to problems of infant feeding in both domestic and international contexts was chaired by Dr. William Foege, then director of the Centers for Disease Control and Prevention. The findings of the task force were published as a supplement to *Pediatrics* in October 1984 (American Academy of Pediatrics, 1984). Dr. Koop chaired the other task force on domestic activities, and the findings were reported to the World Health Assembly in Geneva. The articles in *Pediatrics* suggested that the evidence that breastfeeding had a large, positive effect on infant health in the United States was inconclusive (USDHHS, 1984); that not much is known about the many factors related to how long and exclusively women breastfeed (Simopoulos & Grave, 1984); that lower income women are less likely to breastfeed (Hendershot, 1984); and that human milk is deficient in vitamin K, vitamin D, and iron. Specifically, regarding vitamin K, authors concluded,

Because human milk provides less vitamin K than fortified formulas do, and because breastfed infants consume relatively small amounts of milk during the first few days of life, vitamin K deficiency in the newborn period is more common in breast-fed than in formula-fed infants. Thus, parenteral administration of a water-soluble vitamin K preparation to the newborn soon after birth is particularly desirable for breast-fed infants. (Miller & Chopra, 1984, p. 639)

The next year, a follow-up report to the 1985 Surgeon General's Workshop (USDHHS, 1985) documented efforts that emerged from the workshop and described useful public health-initiated approaches to breastfeeding promotion that were being implemented around the country. This report summarized recommendations in five key areas of the public health

action that were consistent with the framework laid out the previous year, including professional and public education; strengthening support in the healthcare sector; developing a broad range of support services in the community; initiating a breastfeeding promotion effort directed toward working women; and expanding research on human lactation and breastfeeding (USDHHS, 1985). These activities were followed, albeit much later, by further actions from the U.S. surgeon general. In 2000, under the leadership of Dr. David Satcher, the U.S. Office of Women's Health and other federal agencies and healthcare organizations came together to develop the *HHS Blueprint for Action on Breastfeeding* (Satcher, 2001), and in 2011, Surgeon General Regina Benjamin issued *The Surgeon General's Call to Action to Support Breastfeeding* (USDHHS, 2011).

Over the last 35 years, the public health approach to breastfeeding, as outlined by these reports, has built on the framework outlined in 1984. The 2000 *Blueprint* drew attention to two additional issues. First, it noted the importance of addressing the racial and ethnic disparities in breastfeeding. The document noted, "Significant steps must be taken to increase breastfeeding rates in the United States and to close the wide racial and ethnic gaps in breastfeeding. This goal can only be achieved by supporting breastfeeding in the family, community, workplace, health care sector, and society" (USDHHS, 1984, p. 9). However, other than acknowledging that "this *Blueprint for Action* is directed toward all women and cuts across all racial and ethnic populations, socio-economic classes, educational groups and employment arrangements" (p. 191), there were no focused actions to address these disparities. Some of the recommendations for research priorities noted the importance of capturing more data on breastfeeding practices among African American and other minority and ethnic groups. Second, it offered a brief statement noting that the marketing of infant formula negatively affects breastfeeding; however, as was the case with prior U.S. recommendations, none of the action items addressed the marketing of infant formula. It is clear, however, in the *Blueprint* that the views about the contributions of breastfeeding to infant health had changed from those outlined in the 1984 articles in *Pediatrics* (Hendershot, 1984): "Extensive research on the biology of human milk and on the health outcomes associated with breastfeeding has established that breastfeeding is more beneficial than formula feeding" (Satcher, 2001 p. 72). The *Blueprint* also acknowledged the research demonstrating that breastfeeding benefits the mother and provides economic and social benefits to the family.

The 20 action steps outlined in the 2011 Call to Action also followed the 1984 framework, with two additions: (1) one action (#6) addressed the marketing of infant formula; and (2) one action (#20) focused on advancing public health infrastructure (USDHHS, 2011). More so than the other documents, the 2011 Call to Action outlined several specific actions that communities could take to address breastfeeding, and it further identified specific populations and organizations that could be targeted by interventions. As the 2000 *Blueprint* did, the 2011 Call to Action identified that breastfeeding had health benefits for the infant and the mother and economic benefits for the family. New to the 2011 Call to Action were references to the psychosocial benefits of breastfeeding for the mother (e.g., lower postpartum depression) and the benefits for the global environment—for example, "Although breastfeeding requires mothers to consume a small amount of additional calories, it generally requires no containers, no paper, no fuel to prepare, no transportation to deliver, and it reduces the carbon footprint by saving precious global resources and energy" (USDHHS, 2011, p. 4).

The 2010 Patient Acceptability and Affordable Care Act (ACA) ushered in an important policy change for breastfeeding promotion and support. The ACA requires workplaces to provide a time and space for hourly workers to pump, and it includes a provision that requires coverage of preventive health services for women, including "breastfeeding support, supplies, and counseling," further defined as "comprehensive lactation support and counseling, by a trained provider during pregnancy and/or in the postpartum period, and costs for renting breastfeeding equipment" (U.S. Department of Health and Human Services, 2018).

Strengths of Our Global and U.S. Approaches

Over the decades, the global and U.S. approaches to breastfeeding protection, promotion, and support have become broader and deeper. We can see a transition from the view that breastfeeding, as the feeding norm, needed protecting from the growing threat posed by the global spread of infant formula through unethical marketing practices, to an approach that saw formula feeding as a norm, resulting in the need to actively promote the benefits of breastfeeding and to support it by eliminating barriers within the healthcare system, workplace, and community. Today, the most recent documents and trends globally and in the United States indicate that the public health approach reflects a social ecological approach to breastfeeding.

This approach recognizes that because many of the forces that affect infant feeding are outside the control of nursing parents and their families, we need interventions that improve conditions at multiple levels of influence, including the individual (intrapersonal), relationship (interpersonal), community, organizational, sociocultural, and policy levels. We are also seeing a growing effort to broadly communicate that the benefits of breastfeeding extend beyond the infant to include the health and well-being of the mother, the community, and the global environment. It is significant that by linking breastfeeding to each of the SDGs, we are challenged to envision ways we can extend breastfeeding promotion and support activities far beyond the usual domains (health care, workplaces) and link our efforts with those seeking to bring peace and prosperity to the world.

► The Rise of Breastfeeding

Breastfeeding rates across the world have increased as a result of these efforts and other trends. One significant factor influencing the resurgence of breastfeeding in the United States was the natural childbirth movement of the 1960s and 1970s (Wright & Schanler, 2001). This movement, although not exclusively focused on breastfeeding, did result in changes to the birthing practices of the early and mid-20th century that had interfered with breastfeeding initiation. This social change, a companion to the women's movement, questioned the medicalization of women's bodies and experiences, including childbirth. The view of birth as natural, not medical, ushered in unmedicated deliveries, childbirth classes, more family involvement, rooming-in, and encouragement of early breastfeeding. These practices foreshadowed those later encouraged by the Baby-Friendly breastfeeding movement (Wright & Schanler, 2001).

The patterns of who is and who is not breastfeeding and for how long have changed significantly since the 1970s. As we noted earlier, the use of breastfeeding substitutes, including wet-nursing and the use of formula, started with the wealthier populations before becoming widespread. There was much concern during this time that education and liberation were leading women to stop breastfeeding. Of some importance is that these same demographic changes, particularly increasing urbanization and female education, led to *improvements* in other public health goals during this same time period. In particular, increases in women's status have been strongly linked to reductions in fertility, increases in birth spacing, and improvements in maternal and child health. A 2003

report by the International Food Policy Research Institute, which investigated the importance of women's status for child nutrition in developing countries, makes this point very clearly:

The empirical results leave no doubt that higher women's status has a significant, positive effect on children's nutritional status in all three regions. Further, they confirm that women's status impacts child nutrition because women with higher status have better nutritional status themselves, are better cared for, and provide higher quality care to their children. . . . Women with low status tend to have weaker control over household resources, tighter time constraints, less access to information and health services, poorer mental health, and lower self-esteem. These factors are thought to be closely tied to women's own nutritional status and the quality of care they receive, and, in turn, to children's birth weights and the quality of care they receive. (Smith et al., 2003, p. xi)

The International Food Policy Research Institute also cautioned that improvements in women's status could result in reductions in breastfeeding, which could result in poorer child nutrition. Although there were inconsistencies in their data, they concluded that:

Women's relative decision-making power has a statistically significant and negative effect on the duration of breastfeeding in all three regions. . . . Gender equality at the community level has an added negative effect in Latin America and the Caribbean. It seems clear that increases in women's status lead them to breastfeed less. (Smith et al., 2003, p. 83)

Women are reacting to the increased evidence, social messaging, and policy support for breastfeeding. However, the reestablishment of breastfeeding is following the same patterns of privilege that the move away from breastfeeding followed historically. Women with higher social status are more able to insist on the accommodations necessary to make breastfeeding successful. Thus, we now see a reversal of the earlier pattern: Women with higher economic and social status—those who are married, are more educated, have more income, and are from majority populations in developed countries—are more likely to breastfeed. Women from more disadvantaged populations are less likely to initiate breastfeeding and more likely to introduce formula sooner. This pattern also has raised concerns because it is happening at a global level.

A study conducted in 2003 by Rafael Pérez-Escamilla examined 23 developing countries using data from the Demographic and Health Surveys between the mid-1980s and mid-1990s. Pérez-Escamilla sought to understand a seeming paradox in the epidemiology of breastfeeding. He observed that breastfeeding data collected a decade earlier suggested that further urbanization and improvements in women's education would decrease breastfeeding rates; however, the data suggested that just the opposite was happening. Breastfeeding was decreasing among women without formal education, whereas it was increasing among women with at least secondary education. The authors reported that they found increases in breastfeeding duration when they would have predicted a decline:

Latin America has been deeply immersed in the epidemiological and demographic transition characterized by increased levels of urbanization, maternal education, and maternal employment outside the home, all of which have been inversely associated with breastfeeding outcomes in developing countries. . . . The case of Brazil and other countries examined raises the concern that breastfeeding duration may be declining among the most disadvantaged groups (e.g., women with little schooling) that stand to lose the most in terms of maternal and child health when this form of infant feeding is abandoned. (Pérez-Escamilla, 2003, pp. S124–S125)

It is worth noting that in the Pérez-Escamilla study, there was an overall increase in breastfeeding during this transition; therefore, the relative shift in breastfeeding by maternal education was a result not only of a decline in women with lower education but also of an increase in women with more education. A recent study in the United States investigated the relationship between the status of women and breastfeeding rates and found that higher rates of breastfeeding at the state level were associated with higher economic status (including median annual earnings and percent of women in the labor force), higher levels of social and economic autonomy (including percent of women with a college degree and percent of women living above poverty), and a more supportive climate for reproductive rights (Smith, 2015). For example, higher rates of breastfeeding were associated with more pro-choice positions held by the governor, the state senate, and the state house; the percent of counties with abortion providers; and laws granting women access to emergency contraception. Similarly,

lower rates of breastfeeding were associated with a variety of anti-choice legislation, including mandatory counseling and delay laws, and laws restricting low-income and young women's access to abortion services (Smith, 2015).

A variety of factors contribute to the positive association between high social status and high breastfeeding rates. The natural childbirth movement, for example, "typically involved middle class, well-educated Caucasian women, the same group of women among whom the earliest increases in breastfeeding rates occurred" (Wright & Schanler, 2001, p. 422S). Pérez-Escamilla (2003) wrote that rising rates of breastfeeding among women with higher education and income are likely to be related to well-executed breastfeeding promotional efforts that change beliefs and attitudes, thereby encouraging mothers and others to want to breastfeed. It is noteworthy that breastfeeding initiation occurred when new mothers were returning to work in greater numbers than ever before. Returning to work full time continues to lead women to stop breastfeeding earlier than they desire; part-time employment has less of a negative effect (Mirkovic et al., 2014).

Although breastfeeding may be the preferred method of infant feeding and may increase overall rates of in-hospital breastfeeding and duration among higher status women, the lack of support for nursers in public spaces, in the workplace, and in the community makes extended or exclusive breastfeeding difficult for many to sustain. The confluence of good promotion and weak support means that those who have more control over their workspaces and schedules, personal circumstances, and resources (i.e., those with higher status) are able to breastfeed longer and are more able to breastfeed exclusively than their counterparts who have less control and fewer resources. However, there have been some improvements in breastfeeding rates among African American women in the United States. A 2013 *Morbidity and Mortality Weekly Report* by the Centers for Disease Control and Prevention reported that between 2000 and 2008, the gap between black and white breastfeeding initiation and 6-month duration rates narrowed significantly (Centers for Disease Control and Prevention, 2013). Nonetheless, the world we largely inhabit today is one that has great disparities in breastfeeding by maternal age, race, ethnicity, income, education, marital status, and obesity. Overall, the patterns in the data suggest that even as breastfeeding is becoming more desirable and preferred, it is inaccessible to many parents. Globally, fewer than half of infants under 6 months of age (40%) are exclusively breastfed (WHO & UNICEF, 2017).

However, when we compare breastfeeding in the industrial era of the 19th and 20th centuries with our current culture of urbanization and industrialization, there are important differences in the way women enter the workforce. First, many countries have instituted family leave so that gestational and sometimes nongestational parents have more time to spend with their very young infants. For instance, India just increased its maternity leave policy from 12 weeks to 26 weeks, and Canada provides 35 additional weeks of parental leave beyond 15 weeks of maternity leave that can be split between both parents. Second, we have much more evidence about the risks of formula feeding, driving parents to prioritize the breastfeeding relationship. And finally, the portable breast pump gives parents a way to maintain breastfeeding, even exclusive human milk feeding, while also returning to work. Although all these are important developments in the landscape of breastfeeding initiation and continuation over the last few decades, the breast pump deserves particular attention.

Like shared infant feeding techniques of the past, including shared lactation, wet-nursing, animal milks, and formula feeding, pumping can again provide a tool that allows for equality through shared resourcing. By using an electric pump, women can disentangle the biological from the social; doing so not only has the potential to increase breastfeeding duration by providing greater flexibility but also has opened the door, once again, to milk sharing by creating stores of disembodied milk, which can devalue the physical connection between breastfeeding parent and child. The prevalence of milk pumping practices is difficult to ascertain using typical breastfeeding survey questions, which elicit information about the feeding product, human milk or formula, rather than the source of milk or mode of delivery. In the United States, there is one national survey, the Infant Feeding Practices Study II, collected between 2005 and 2007, that explored women's experiences with breast pumping. Labiner-Wolfe and colleagues (2008) found that most women had expressed breast milk at some point, but approximately one-quarter of women expressed breastmilk on a regular basis, and this number decreased as infants aged. It is easy to assume that pumping would increase breastfeeding duration in the workplace, but in fact, the only study to examine this shows that pumping had a null effect on breastfeeding duration among working women (Yourkavitch et al., 2018). This study, however, used data from the Infant Feeding Practices Survey, which was collected before the ACA of 2010. The ACA mandated that insurance companies provide pumps to all women and that employers provide women with a place and time

to pump at work, normalizing breast pumping and exponentially increasing the use of breast pumps both in and outside the work setting (United States Congress, 2010).

The prevalence of milk sharing is even more difficult to ascertain. Three modes of milk sharing have been documented: (1) donating milk to milk banks, where it is tested, pooled, and pasteurized and distributed predominantly to ill or premature infants in NICUs; (2) casual sharing among known friends or family members or among unknown parties; and (3) selling milk to companies or individuals. Milk banking is practiced in many countries worldwide, some with well-developed and centrally organized systems of education, collection, and distribution, such as Brazil. Not all countries have or even allow milk-banking, however (Ghaly, 2018). For example, Muslim tradition does not allow marriage between individuals who have shared milk from the same mother, making milk banking impractical because of the pooling of milk from multiple mothers that occurs. Casual milk sharing is on the rise, with Internet-based free milk-sharing sites active in at least 50 countries (Akre et al., 2011), as well as coordination of milk-sharing partnerships by some members of the healthcare team (O'Sullivan et al., 2016) and extensive local networks in which friends, families, and acquaintances share human milk resources through pumped milk and cross-nursing practices (Reyes-Foster et al., 2015). Unlike milk banks, casual sharing is uncontrolled, meaning that there are no formal screening tests for the donating mother, nor a way to verify that the milk is unadulterated, leaving donors and recipients to develop their own screening tools and systems to establish trust in the transaction (Palmquist & Doehler, 2016).

Human milk sold for profit from nonregulated sources poses significant concern because a level of risk exists that is not present when obtaining milk from milk banks or from known donors. As with dairy, when human milk is commodified, sellers could be enticed to reduce the quality by diluting or modifying it to increase profits, or women could be exploited by "manufacturing" the product using less expensive or disadvantaged labor pools. Like wet-nursing, the risk of commodifying human milk is that the resources are pooled at the top of the social strata, and those with fewer options end up producing milk for sale or obtaining milk in unhealthy situations. However, in the same way that disembodied human milk opens the door to commodification, it also expands options for sustaining human milk feeding while returning to work or reestablishing independent social activities. As stated by Kate Boyer, "If we start with the assertion that the transmittal of breast milk is a

foundational act of care, what can this story tell us about the new geographies of care enabled by breast pumps and mobile breast milk? First, it illustrates just how far, both geographically and socially, what is commonly understood as a high-touch interaction can be stretched” (Boyer, 2010, p. 12). Cultural flexibility is again taking root within a framework that includes professional childcare settings, dual-income families, and nongestational parents opting to be primary caretakers. This, in conjunction with our increasing knowledge about the risks of formula feeding and the normalization of sharing personal information through social media, has driven us back to practices similar to hunter-gatherer societies, in which small groups of trusting individuals are reaching out across traditional social barriers and public health concerns and forming milk-sharing partnerships.

► Challenges Going Forward: The Breastfeeding Conundrum

In an effort to promote and support breastfeeding, we have at times failed to support nursers. Indeed, many have argued that our efforts have focused more on promoting the infant health benefits of breastfeeding, leading mothers and others to want to nurse, but less on providing real, practical support that can help nursers overcome the many constraints they face in extending exclusive breastfeeding beyond the early days and months. For instance, the penalties for not providing workplace accommodations for women who are pumping are limited, meaning that workplaces with disempowered workers are less likely to implement breastfeeding-friendly policies. This type of disparity could explain why we see significant and unacceptable differences in breastfeeding rates by race, ethnicity, income, and other indicators of status. An edited volume of papers on women’s lives and experiences with breastfeeding concluded that the difficulties many women experience stem from the challenges of trying to integrate employment with motherhood combined with gender role inequities that continue to place most of the burden for ensuring the family’s health and care on women (Smith et al., 2012, p. 1).

A 2016 study reported in *The Lancet* similarly noted that women should not be shouldering full responsibility for the success or failure of breastfeeding since “her ability to breastfeed is very much shaped by the support and the environment in which she lives. There is a broader responsibility of governments and society to support women through policies and

programs in the community” (Rollins et al., 2016, p. 491). Similarly, a recent narrative review of the literature identified themes related to factors that create an enabling environment for breastfeeding and revealed the continued need to develop interventions across the social ecology beyond the individual level (Brown, 2017).

An examination of the lives and experiences of breastfeeding women reveals two important yet contradictory realities that helped to shape this pattern of breastfeeding rates, showing disparities by race, income, and education. First, for breastfeeding to be successful, mothers and babies must be together, and second, being with babies often reinforces gender inequities in ways that could undermine women’s economic security and political and social status (Smith et al., 2012). Despite the progress that has been made both in the United States and around the world, one important persistent concern stands out: It is difficult for our social solutions to reconcile the biological imperative of lactation with the realities of the lives of breastfeeding parents who participate in the labor force and are active in public spaces. Navigating the challenges between these two realities is more difficult for women and families with fewer economic and social resources.

This irony of general societal acceptance of the benefits of breastfeeding and the general lack of societal support for breastfeeding parents in working and public spaces has created a *breastfeeding conundrum*. The conundrum erupts when most people know and believe that breastfeeding is the healthier choice and want to *try* it, but they find that feeding at the breast, or embodied feeding, is so challenging that they wean from the breast/chest or supplement prematurely with expressed milk and/or formula. Indeed, pumping has become one solution to this breastfeeding conundrum. Research by British scholar Johnson and colleagues (2010) suggests that women pump because it helps them navigate the dilemmas that come from the varying cultural pressures and contradictions they experience when trying to be good breastfeeding mothers, workers, and partners. They concluded that for “many women feeding their baby is a matter of balancing different demands, finding solutions, and struggling with choices in difficult circumstances” (Johnson et al., 2010, p. 187). Pumping, like the use of human milk supplements throughout history, makes it easier for mothers and others who nurse to be separate from their child; it also expands the circle of those who feed the baby and facilitates shared parenting. As was the case with wet-nursing in the past, pumping may be viewed as optimizing the resources of mothers and family by allowing the mother to work and to take

advantage of various opportunities. A study analyzing data from the U.S. Infant Feeding Practices Survey II found that the most commonly cited reason for pumping was the ability to have someone else feed the baby (work as a reason was not an option in the survey); related to this was the second most common reason: to have an emergency supply (Yourkavitch et al., 2018).

Hrdy (2000) reminds us that for most of human existence, human and nonhuman mothers have worked to combine their productive and reproductive responsibilities and that combining

work with motherhood has always entailed tradeoffs. Mothers either sustain energetic costs and lost efficiency by toting babies everywhere . . . or else located an alloparent to take on the task. What is new for modern mothers, though, is the compartmentalization of their productive and reproductive lives. The factories, laboratories, and offices where mothers in postindustrial societies go to “forage” are even less compatible with childcare than jaguar-infested forests and distant groves of mongongo nuts reached by trekking across deserts. (p. 109)

Despite public health efforts to promote, protect, and support breastfeeding, the real difficulties that come from trying to integrate nursing and being a parent with paid employment and breastfeeding in public continue to result in decreasing breastfeeding rates, particularly for women who have lower income jobs. Next-generation breastfeeding protection, promotion, and support efforts must address this breastfeeding conundrum.

Caregiving and Paid Labor: Fixing the Conundrum

Too much focus on the nutrient content of human milk can detract our attention from breastfeeding as a nurturing practice. Van Esterik and O'Connor (2017) wrote that our tendencies toward *dualistic* thinking led us to frequently separate biology from culture. We create separatism both academically and practically, and we fragment wholes into bits. They described a four-step reductionist process that turns “nurturing (a flexible social relationship) [into] nutrients (fixed physical facts)” (Van Esterik & O'Connor, 2017, p. 28). (See **BOX 2-4**.) This reductionist process focuses our gaze on human milk as the best nutrition for the baby and less on how breastfeeding as a nurturing practice actually gets done.

Nursing as an aspect of nurture has certain characteristics—it is part of an embodied form of care, it is gendered, it is real labor, and it is unpaid. These characteristics interact with one another to shape the

BOX 2-4 Fragmenting the Whole—All Babies Need Not Just Food, But Nurturing

- Step 1: Reduce that larger truth (*nurturing*) to what is easier to study and, seemingly, most essential—*feeding*.
- Step 2: Reduce feeding, an act simultaneously social and physical, to its physical fraction—*food*.
- Step 3: Reduce this food to generic *milk*, forgetting that the substance varies woman to woman and changes adaptively over the course of feeding.
- Step 4: Reduce generic milk to its *nutrients* as if it were not a veritable soup of living antimicrobial, anti-inflammatory, and immunoregulatory agents.

Reproduced from Van Esterik P, O'Connor RA. *The dance of nurture: negotiating infant feeding*. New York, NY: Berghahn Books; 2017.

practices and experiences of mothers and others who nurture infants and young children.

Mann (2017) reminded us that caring for others is valuable for its own sake, not just because it leads to better health outcomes:

embodied care is an *ethic* that understands individual and social morality as deeply bound up with the caring relationships and communities in which human beings are embedded. Care is also a *set of practices* whereby individuals take up the work of caring for the bodies of others . . . with and through their own bodies . . . Finally, care . . . is a virtue that is choice worthy because it is a context within which we become most fully human. (pp. 19–20)

She further posited that breastfeeding, like friendship, provides us

with the necessary context to *learn* how to do well by others. Caregiving relationships, in particular those that arise within the contexts of child-rearing and maternity, are most valuable because they form an important structure in which we learn other-regarding thought and action, and they also become the enabling conditions for our own acting and doing well in life. (Mann, 2017, p. 20)

This benefit to the breastfeeding parent is generally not discussed in the breastfeeding promotion literature or activities.

Ironically, caregiving—this life-affirming activity—is socially gendered. That is to say, both historically and currently, women—mothers, daughters, sisters—are assigned responsibility for most caregiving activities, even if it is not biologically required. This social gendering

of caregiving has several important consequences: (1) because it is generally unpaid and assigned to women, caregiving receives fewer social resources and has lower social status than forms of work that are paid; (2) this imbalance in status and resources may obscure the value of caregiving for individuals, families, and societies; (3) fulfilling this unpaid role can become an impediment to women's security if, or when, it leads or requires them to *trade off* career/employment opportunities; and (4) gendering has the potential to obscure the caregiving and infant feeding preferences and practices for lesbian, gay, bisexual, transgender, queer, and intersex (LGBTQI) parents, particularly those who are male or transgender, and for men more generally. (See **BOX 2-5**.)

Mulford (2012) in fact argued that breastfeeding, or “extreme caregiving,” is real labor that can be physically and emotionally demanding. Similar to what Mann (2017) writes, Mulford notes that breastfeeding is care work because, in part, of the intimacy created by the use of the caregiver's body to provide protection and food:

The physical mouth-to-breast contact between care receiver and caregiver is highly personal, as is the temporal interlocking of mothers' and child's rhythms of activity, relaxation, provisioning, and sleep. The physiological function of lactation draws on the caregiver's nutritional reserves, changes her hormone profile and her body shape, affects her fertility and her state of mind, and has an impact, predominantly positive, on her short-term and long-term health. (Mulford, 2012, pp. 128–129)

BOX 2-5 About Transgender Breastfeeding

A 2018 case report in *Transgender Health* (Reisman & Goldstein, 2018) described the process whereby a 30-year-old transgender woman was able to “breastfeed exclusively for 6 weeks. During that time the child's pediatrician reported that the child's growth, feeding, and bowel habits were developmentally appropriate. At 6 weeks the patient began supplementing breastfeedings with 4–8 oz of [formula] daily due to concerns about insufficient milk volume. At the time of this article submission, the baby is approaching 6 months old. The patient continues to breastfeed as a supplement to formula feeding, and she continues to adhere to [her] medication regimen” (p. 25). This story upends our traditional notions of who can biologically breastfeed, who wants to breastfeed, and how families organize caregiving roles and responsibilities.

Data from Reisman T, Goldstein Z. Case report: induced lactation in a transgender woman. *Transgender Health*. 2018;3(1):24–26.

It is, however, labor that often remains invisible in terms of its contribution to the well-being of our society. Unpaid caregiving is big business around the world. As of 2015 in the United States, 40% of all mothers with infants under age 1 were not in the labor force. In addition, according to the Family Caregiver Alliance, over 40 million people each year provide care to an adult or child (assisted with tasks of daily living or medical care), and about two-thirds of all caregivers are women. As the primary caregivers, female caregivers spend more time providing care than male caregivers (21.5 vs. 17.4 hours/week). This issue is global in scope. The Organization for Economic Co-operation and Development (OECD) argued that the gender imbalance in the provision of unpaid care work is reflected in the gender imbalance in paid labor and its benefits.

Time is a limited resource, which is divided between labour and leisure, productive and reproductive activities, paid and unpaid work. Every minute that a woman spends on unpaid care work represents one minute less that she could be potentially spending on market-related activities or investing in her educational or vocational skills. (Ferrant et al., 2014, p. 1)

Gender inequality in care work is greater in lower wealth countries, such that women in low-income, lower-middle-income, and upper-middle-income countries spend more time in care work relative to men as compared with women in higher-income countries. This is largely due to men's increasing role in care work in higher income countries. The more hours women spend in unpaid caregiving activities, the less likely they are to be employed; if they are employed, they are more likely to be employed in part-time, low-income, and/or insecure positions. Ultimately, unpaid care work leads to lower income both over the course of a career and in retirement. The OECD report argued that outsourcing this care work is unaffordable for most women and that both discriminatory policies and social norms contribute to gender inequalities in unpaid care work (Ferrant et al., 2014).

The economic value of caregiving and of breastfeeding remain largely unmeasured and invisible. The Family Caregiver Alliance estimates that the monetary value of caregiving in the United States is \$470 billion. A study by Price Waterhouse assessing the value of unpaid caregiving for the Australian economy concluded that unpaid childcare has a true economic value of \$345 billion, making it Australia's largest industry. The authors argue that “counting” the

value of caregiving is important for several reasons: It highlights the importance of this work to society; it contributes to a better picture of the value of women's labor and the division of labor in society; and it provides data for policy and social investment decisions. They concluded that "the issue becomes how we can ensure that the requirements of the unpaid economy, and the value it generates to society, is given appropriate weight in policy and investment decisions" (Thorpe et al., 2017, p. 5).

Several studies in both the developed and the developing world have produced estimates for the economic value of human milk production. Julie Smith, an economic researcher in Australia, argued that it is important to estimate this value in order to "a) emphasize the extent of breastfeeding and its value, b) acknowledge women's unique contributions to society, c) highlight its importance to economic welfare, and d) contribute to more accurate public policy analysis and more soundly based economic and health policies" (Smith, 2013, p. 538). Her analysis of the value of human milk produced in Australia, Norway, and the United States, which based the market price of human milk on the price of milk sold by North American milk banks, estimated the value of human milk production to be US\$1 billion in Norway, US\$45 billion in the United States, and US\$3.6 billion in Australia. This value is well below the biological potential because it is based on breastfeeding prevalence; Smith estimated that about 60% of the potential human milk production is lost in the United States and Australia, and 40% is lost in Norway.

The economic and social value of caregiving for society makes clear how important it is for caregivers to continue doing this work, even when they also participate in the paid labor force. However, most societies and communities throw up roadblocks that make it difficult to do both. For example, in the United States, most employees return to work soon after birth and do not have access to paid, or even unpaid, parental leave or childcare at the workplace. Mothers and others must navigate caregiving, nursing, and paid work in the context of both a conceptual and a spatial separation of the public world of work and the private world of family and caregiving. The persistence of this separation certainly complicates the lives of mothers and others because it is not altogether easy to keep the public and private each sequestered in its own place. During the time nursing parents are at work, lactation does not stop and children are not invisible. It is difficult to live in the boxes society prescribes for us; things just have a way of seeping out.

Aside from the provision in the ACA (United States Congress, 2010) requiring employers with 50

or more employees to provide nursing mothers with time and space, the United States has not passed any major federal initiative to help workers accommodate their family and work demands since the Clinton administration passed the Family and Medical Leave Act in 1993. Additionally, only women who are "nonexempt employees covered by the Fair Labor Standards Act (FLSA)," meaning those who work 40 hours a week and are eligible for overtime, are covered by the ACA. Women who are not covered by FLSA may be covered by state laws. The lack of such policies and practices makes it more difficult for many parents to navigate the competing demands and responsibilities of the workplace and family and dampens individual and family economic security.

A full accounting of the value of human milk production could shift policy discussions about government funding for food, formula, and caregiving. For example, Smith (2013) noted that the United States expends significant public resources on programs that reduce the cost of infant formula for low-income families, and these dollars are visible. But the value and cost of human milk is not visible. Smith writes,

If breast milk were more visible in economic statistics such as GDP, greater funding priority might be given to potentially more cost-effective programs that expand human milk production by increasing breastfeeding. Such programs might include, for example, implementing the Baby-Friendly Hospital Initiative including restraining unethical marketing through hospitals, financing access to peer counselor or health professional lactation support, or introducing paid maternity leave and requiring breastfeeding accommodation in workplaces. (p. 544)

Policies, practices, and norms supporting working parents and nursers are key to fixing the conundrum because work—not marriage—is vital to women's economic security. A study examining the changes in the causes of women's poverty over the 30-year period from 1960 to 1990 in the United States revealed significant and important shifts in the causes of women's poverty (Lieb & Thistle, 2006). Historically in the United States, marriage was women's way of avoiding poverty; today, it is paid employment. The authors concluded that the data clearly indicate that "marriage as a solution for women's poverty is an outdated approach, a story for the 1950s rather than today. Secondly it is an approach that is not race neutral, since statistically, it is less likely to be advantageous to women of color . . . however, work in

and of itself does not end poverty. Rather such work must provide decent wages and benefits. . . . *Women raising children face the highest poverty, in part due to the difficulties of combining work at home and for pay [emphasis added]*” (Lieb & Thistle, 2006, p. 17). This new reality calls for policies that support the better integration of our reproductive and productive roles, of our ability to care for children and to be successful economically. More than good policy, such strategies are “essential to human life, . . . [and] a more efficient way to spend public funds to reduce poverty” (Lieb & Thistle, 2006, p. 18).

This shift in the circumstances surrounding wealth and poverty for women has implications not only for the United States but also, possibly, for many other countries. Leib and Thistle’s (2006) analysis suggests that the shift toward work and away from marriage comes from women’s improved opportunities for employment, including decent wages and benefits and reduced employment discrimination. These circumstances are not unique to the United States and are conditions that are worthy of support worldwide. The *choice* to breastfeed at the expense of real economic security is a “Sophie’s choice,” or a choice between two unbearable options.

This is a troubling conundrum because both caregiving and paid work are critical for a healthy society: We need people to care about children and who can help raise a smart, healthy, moral next generation; we need people who can care for the sick or vulnerable; and we need people to engage in paid work that sustains them and the society. To relieve this conundrum, we must work toward a social agreement that breastfeeding is a socially valued activity, that breastfeeding is a worthy choice for its own sake and for human health, that it is valuable to have parents participate in the labor economy, and that society shares in the responsibility for raising children. The labor and pleasure of breastfeeding, along with its economic and social value, call for an approach to policy and investment that acknowledge and support this value and those who do it. Oakley and O’Connor (2015) argued for an ethic of care approach to social policy, which acknowledges that all humans need to be cared for at some point—at the beginning of life, at the end of it, and at points in between—that caregiving is socially valuable, and that society shares responsibility with individuals for care work. Social policy should be geared toward ensuring that care occurs and that caregivers are rewarded. Policies and practices that reward caring, however, also must take into consideration that breastfeeding is an embodied form of nurture that may demand more time from one parent than another.

Summary

This short history of infant feeding practices reveals seven important themes about how the feeding and care of infants is accomplished by real people in the context of their culture, time, and place. These themes reveal that human culture is indeed far from proscribed. We are biologically complex and socially adaptable, and we have created an almost endless array of parenting styles and cultural norms around infant feeding and care. The forms of feeding that are culturally accepted change over time; today, most of us would shudder at the idea of feeding our infants directly from the udders of cows. Instead, today we accept feeding our infants from bottles that contain milk sucked from women’s breasts by a machine. Today, Internet-supported informal milk sharing is gaining in acceptance in some communities but is still not recommended by many public health authorities. However, as we have explored in this chapter, human milk sharing has been part of our feeding practices for thousands of years.

Today, formula, human milk sharing, and pumping are all feeding practices that allow for people other than the nursing parent to feed the baby. This allows mothers and others to separate from the baby while expanding the circle of those who can participate in feeding; this is reminiscent of the cultural value of prelacteal foods used historically in some places and still widely practiced around the world. Although we continue to discuss the harm to infants from these other sources of food, mothers and others must balance the risk of alternative feeding strategies against the social benefit of expanding the child’s *circle of care* and of being able to leave the child to go to work. From this point of view, formula has both health risk and social value, whereas breastfeeding has both health benefits and social risk. Looked at from the view point of the value of care, however, breastfeeding has real social value. The risk–benefit calculus is more complex with the more variables we add to the equation.

We frequently reduce the value of human milk to the level of its nutrients. This lens guides much of our health promotion of breastfeeding as *best* and *the most nutritious food*. Commodification of human milk has both positive and negative consequences. The positive side is that we are able to increase the perceived value of human milk for human health and the desire of mothers and others to breast/chestfeed. This desire leads to both pumping and human milk sharing and may increase the proportion of infants who receive human milk. On the negative side, viewing human milk primarily as nutritious food could contribute to our taking a narrow health-focused approach to assessing

the risks (of formula) and benefits (of breastfeeding) while ignoring the aforementioned social risk–benefit calculus. Commodification of milk may also slip into the commodification of those who provide the milk—as happened historically with slaves, paid wet-nursing, and now when companies pay women for their milk. Finally, this practice also *neuters* breastfeeding; it obscures the reality of breastfeeding as embodied care work, with its concomitant challenges, constraints, and consequences for women who remain the main providers of unpaid, socially undervalued caregiving.

Ignoring the gendered nature and social risks of breastfeeding as embodied caregiving has two particularly troubling consequences. First, many of those who want to breastfeed—in particular, mothers and others who seek to combine nursing with employment—still do not have the structural and normative supports they need to successfully do this. Our history teaches us that mothers have always worked, and the supports and resources available to them, including breastfeeding substitutes, shape how they feed and care for their infants. Today, we see pumping, mixed feeding, and early weaning. In earlier times, we saw wet-nursing and various forms of dairy feeding. The need to work takes us back to the need that many parents have to expand their infants’ circle of care and to secure feeding strategies that support this.

Particularly troubling is the persistent theme that class-based societal structures, which concentrate resources at the top of the social strata, operate in ways that also make it more feasible for women/families at the top to feed their infants in a manner that is seen as the most desirable at the time; meanwhile, those at the lower end of the strata find it more difficult to feed their babies in the socially determined “best” way. We see this play out when wealthy women employed wet nurses, whose own babies sometimes died for lack of their mother’s breastmilk; this occurred when the status of wealthy women began to rise in society, and breastfeeding became something that “poor women” did. Today, we see rising breastfeeding rates among women with higher status. These women have the benefit of being able to afford electric pumps, of working in a private office that makes pumping easier, of having one stable job, and of having access to maternity leave.

Over time and place, it has become clear that although babies have to be fed, they do not have to be breastfed. There have always been, and will continue to be, human milk substitutes that are used by a wide swath of the population. Breastfeeding is not really an “unmovable object” standing in the way of “unstoppable forces”; the forces of economic, social, demographic, and political change have powerful effects on how individuals, families, and communities feed

their babies. However, we also see that breastfeeding is a survivor: Although rates have waxed and waned, it continues to be a valued, if not the most valued, way of feeding and nurturing children. Of particular interest at this point is the question of *why*. What enables this embodied form of nurture to survive? Is it the nutrient value of breastmilk? Is it because breastfeeding saves lives and improves human health? Is it because nurture and care are part of our humanity? Is it because of the pleasure nursing offers to mothers and others? Is there some biological yearning? Is it the policies we put in place to protect, promote, and support breastfeeding? Also, what should we seek to optimize? The quality of the experience of those who nurse? Exclusivity or duration? The milk supply? How we choose to answer these questions and advance our policies, programs, and advocacy will have important influences on the patterns of breast/chestfeeding that we see going forward.

Key Concepts

- The forms of infant feeding that are culturally accepted change over time.
- Parents engage in practices that expand the circle of those who love, care for, and feed children.
- We engage in practices that commodify human milk, valuing it primarily for its caloric and nutrient potential, that run the risk of overemphasizing the health benefits at the expense of other nurturing potentials.
- Lactation and breastfeeding are linked to gender, and this linking has consequences for who we expect to nurse and for the impact that nurturing others has on the caregiver.
- Women have always worked to help sustain the family economically, and the need for their contributions shapes how families feed and care for their children.
- Class-based societal structures, which concentrate resources at the top of the social strata, operate in ways that also make it more possible for women/families at the top to feed their infants in the way seen as most desirable (at the time); meanwhile, those at the lower end of the strata find it more difficult to feed their babies in the best way.

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