The First 1,000 Days: Nourishing America's Future

1,000 DAYS

1,000 DAYS

1,000 Days is the leading non-profit advocacy organization working in the U.S. and around the world to improve nutrition, particularly during the 1,000 day window between a woman's pregnancy and her child's 2nd birthday. We work to promote action and investment in nutrition in order to build a strong foundation for children, their families and their nations to thrive.

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Executive Summary

The 1,000 days between a woman's pregnancy and her child's 2nd birthday offer a unique window of opportunity to build healthier and more prosperous futures. The right nutrition during these first 1,000 days can have a profound impact on a child's ability to grow, learn and thrive—and a lasting effect on a nation's health and prosperity.

Good nutrition during pregnancy and the first years of a child's life provides the essential building blocks for brain development, healthy growth and a strong immune system. In addition, a growing body of scientific research indicates that the foundations for lifelong health—including predispositions to obesity and certain chronic diseases—are largely set during this 1,000 day period.

There are three crucial stages in the first 1,000 days: pregnancy, infancy and early childhood. During pregnancy, a mother's health and eating habits have a significant impact on the development and future well-being of a child. If a mother's diet is not giving her the nutrients she needs to support a healthy pregnancy and her baby's development or if it is contributing to excessive weight gain—or both—it can have serious, long-term consequences. From birth through the first year, breastfeeding provides unparalleled brain-building benefits and gives babies the healthiest start to life. Because of the unsurpassed benefits of breastfeeding, the world's leading health agencies including the World Health Organization (WHO) and the American Academy of Pediatrics (AAP) recommend that babies are fed only breastmilk for their first 6 months, but many mothers lack the support they need to meet this recommendation. And, finally, beginning at 6 months of age, children should eat a diverse diet of nutrient-rich foods to help fuel their growth and development and shape their taste preferences for healthy foods. Throughout early childhood, parents and other caregivers should also teach healthy eating habits and make sure that water and other non-sugar-sweetened beverages become a consistent part of a child's diet. Deficiencies in key nutrients, poor eating habits and unhealthy weight gain during the early years of a child's life can set the stage for numerous developmental and health problems down the road.

Unfortunately, in examining the nutritional health of U.S. infants, toddlers and their families, the data reveal a number of troubling trends. Too many American women enter pregnancy overweight or obese, and too many gain excessive weight while pregnant. This trend, underpinned by uneven access to quality preconception and prenatal care in the U.S., is contributing to tragically high levels of maternal death.

In addition, the majority of U.S. babies are not breastfed in accordance with AAP and WHO recommendations, and 1 in 5 babies in America are never breastfed at all. The low rates of breastfeeding in the U.S. are driven by an overall lack of support for mothers to breastfeed, including a lack of access to paid maternity leave.

Regrettably, the diets of U.S. infants and toddlers now mirror the adult American diet—with too few fruits, vegetables and other nutrient-rich

foods and too many added sugars and saturated fats. These dietary patterns are putting children's health and development at risk. The data reveal that 25% of U.S. children between one and two years of age do not receive the recommended dietary allowance for iron (a key brain-building nutrient), and that 10% of U.S. children exhibit signs of overweight or obesity before reaching their 2nd birthday.

While the problem of poor nutrition in the first 1,000 days is pervasive across America, the burden falls hardest on low-income families and communities of color, leading to a concentration of poor health outcomes in these populations. One in five children under the age of six are part of families who struggle to put enough nutritious food on the table. These children are less likely to thrive and more likely to suffer health problems and developmental delays. Black, Hispanic, and other communities of color are most affected by food insecurity, and, as a result, their children are less likely to get a strong start to life. In this way, poor nutrition early in life contributes to deepening disparities and can make a family's climb out of poverty all the more difficult.

The nutrition of all of America's infants and children must be a social and economic imperative. By contributing to a

THE FIRST 1,000 DAYS IN THE U.S. SCORECARD

A healthy and nutritious diet for mothers during pregnancy	Nearly half of women gain an excessive amount of weight during pregnancy.
Good care for all mothers during pregnancy	The U.S. has one of the highest maternal mortality rates of any wealthy country in the world.
Exclusive breastfeeding for the first 6 months	Only 22% of infants are exclusively breastfed at 6 months.
Nurturing, responsive care and feeding of babies and toddlers	Less than half of U.S. mothers receive any paid time off to care for their newborn.
The right foods introduced to babies at the right time	Almost 40% of parents introduced solid foods to their babies too early.
A healthy and nutritious diet for babies and toddlers	1 in 4 toddlers are not getting enough iron in their diets—a key nutrient for brain development.
Water and other healthy beverages with no added sugars for toddlers	More than half of toddlers and preschoolers consume one or more sugar-sweetened beverage every day.
The right knowledge and skills for parents and caregivers to properly nourish young children	54% of mothers say they receive mixed messages about what to feed their young children.
Consistent access to enough nutritious food for families of young children	1 in 5 children under the age of 6 live in families that struggle to put enough nutritious food on the table.
Societal investments in the well-being of every baby and toddler	More than 25% of infants and toddlers live in poverty.

less competitive workforce and higher healthcare costs, the effects of poor child nutrition affect us all. Experts estimate that the health-related costs of food insecurity in America total $160 billion, more than a third of the U.S. Government's budget deficit.

The quality of a child's nutrition is shaped not only by decisions made by his parents and caregivers, but also by broader social and economic factors. For this reason, everyone has an important role to play in ensuring our nation's youngest children get the nutrition they need for a strong start to life. This report identifies a set of 10 "wins" that can have a transformative impact on the first 1,000 days and the future health and well-being of all babies and toddlers in America.

10 WINS FOR THE NEXT 1,000 DAYS

1. Empower parents and caregivers with an understanding of the importance of early nutrition and knowledge of best practices for infant and young child feeding.
2. Educate and train medical and health care professionals, child care workers and others working with expectant mothers, babies and toddlers on the importance of early nutrition and optimal infant and young child feeding practices.
3. Establish evidence-based dietary guidelines for pregnant women and children under age 2.
4. Invest in the research, monitoring and surveillance of the nutritional status of pregnant women and children under age 2.
5. Support healthy pregnancies by ensuring access to high quality preconception and prenatal care, nutrition education and obesity prevention programs.
6. Improve support for mothers to breastfeed by creating breastfeeding-friendly communities, workplaces and healthcare facilities.
7. Invest in paid parental leave and family-friendly workplace policies to support parents to give their children the strongest start to life.
8. Encourage companies to follow the World Health Organization's International Code of Marketing of Breast Milk Substitutes which provides guidelines for the ethical marketing and promotion of infant formulas and foods and beverages for young children.
9. Strengthen programs that reach low-income babies, toddlers and their families.
10. Ensure that healthy, nutritious foods are the affordable, available and desired choice for all families.

Building on existing initiatives and efforts, there is an opportunity to work in partnership to achieve these wins and improve the nutritional health of America's youngest children. Understanding the impact that nutrition has on lifelong health, school-readiness and giving children a fair start is a critical first step. As the science and the data clearly show, action to improve nutrition during the first 1,000 days must be part of any strategy to ensure optimal child development, reduce disparities and enable future generations to live healthier lives. Finally, increasing our investments in babies and toddlers and making their well-being a national priority is essential to ensuring a brighter future for them and for us all.

INTRODUCTION

Nourishing America's Future

The first 1,000 days of a child's life—from pregnancy to age 2—offer a unique window of opportunity to build healthier and more prosperous futures. It is a period of tremendous potential and enormous vulnerability.

During this time, how well or how poorly a child is nourished has a profound impact on her ability to grow, learn and thrive. This is because nutrition during pregnancy and the first years of a child's life provides the essential building blocks for brain development, healthy growth and a strong immune system. And a growing body of scientific evidence shows that nutrition during the first 1,000 days affects our lifelong health—including our predisposition to obesity and certain chronic diseases later in life—and can even affect the health of future generations.

Poor nutrition early in life has repercussions beyond an individual child or her family. The effects can also be felt at a societal level—from a less competitive workforce to higher healthcare costs and greater inequality of opportunity.

In many ways, our understanding of the lifelong and societal impacts of nutrition in the first 1,000 days is still in its infancy. This report represents an attempt to contribute to that understanding and to galvanize a movement to ensure that every child in America has a healthy first 1,000 days. In Part 1 of the report, we examine the foundational role that nutrition plays in giving young children a strong start to life. In Part 2, we look at how young children and their families in the U.S. are faring when it comes to nutrition. Finally, in Part 3, we highlight areas where greater action is needed to improve the nutritional health of America's youngest children and their families.

IN HER WORDS

Throughout this report, we include perspectives from mothers and caregivers of young children. Most of these perspectives were gathered as part of qualitative research 1,000 Days conducted with 19 mothers and caregivers of babies and toddlers in 6 American communities. A few were collected through the personal stories and photos women shared with 1,000 Days on Facebook. The women who participated in the qualitative research completed food journals to chronicle their children's diets and generously allowed researchers into their homes for interviews. In some cases, their names have been changed to protect privacy. We are deeply grateful to all the mothers and caregivers who shared their stories with us and gave us permission to publish their words and images in this report.

"If we want to shape the future, to truly improve the world, we have 1,000 days to do it, mother by mother, child by child, for what happens in those 1,000 days through pregnancy to the second birthday determines, to a large extent, the course of a child's life, his or her ability to grow, learn, work, succeed and by extension, the long term health, stability and prosperity of the society in which that child lives." [1]

ROGER THUROW, AUTHOR OF THE FIRST 1,000 DAYS: A CRUCIAL TIME FOR MOTHERS AND CHILDREN–AND THE WORLD

PART 1

Nutrition in the First 1,000 Days – Why it Matters

All parents share a common goal for their children—to grow up to be happy and healthy adults who achieve their full potential. To that end, parents want to give their children the very best start. At no other time in life is there a greater opportunity to impact so many aspects of a child's development than during the "first 1,000 days" from pregnancy through 2 years of age. Proper nutrition during this period builds the foundation for brain development and lifelong health. It can mean the difference between a life of productivity or struggle, and sometimes, between life and death.

Throughout the past decade, there have been rapid advancements in our understanding of how children develop and how nutrition and other experiences in early life impact long-term health outcomes. New research in the fields of neuroscience and the early origins of adult health is shedding light on how our brains develop, how our bodies become susceptible to diseases and how our capacities and skills are either nourished or thwarted. The science of child development shows that children need three fundamental supports in order to thrive as adults: appropriate nutrition; stable, responsive relationships with caregivers; and safe, nurturing environments.[2] When one or more of these supports is absent, a child's physical, social, emotional and cognitive development can go awry, resulting in the loss of opportunities that are every child's birthright.

Poor nutrition early in life can have long-term consequences not only for the child but also for her family, her community and even her offspring. The effects can be felt at a societal level—from a less competitive workforce, to higher health care costs, to greater inequality of opportunity.[3,4] Therefore, the nutrition of our youngest children should not be seen as simply a matter of parental responsibility but rather as a social and economic imperative.[5]

The 1,000 days between a woman's pregnancy and a child's 2nd birthday offer a brief but critical window of opportunity to impact the lifelong health and well-being of children. While good nutrition is essential throughout life, we will examine nutritional needs and challenges in the context of three unique stages within the first 1,000 days:

PREGNANCY
INFANCY
EARLY CHILDHOOD

Nutrition: A Foundation for Brain Development and Learning

Nutrition fuels the growth and development of the brain early in life. It lays the foundation for cognitive abilities, motor skills and socio-emotional development which in turn profoundly influences success in school and economic opportunities later in life.

The brain dominates the body's metabolism in early life. A young child's brain consumes two-thirds of all the calories his body uses at rest.[6] During the first 1,000 days, the brain grows more quickly than at any other time in a person's life. Throughout this time, the right nutrients are needed at the right time to feed the brain's rapid development. Several nutrients in particular have profound and long-lasting effects on the brain (see call out "The Developmental Course of the Human Brain").

At every stage during the 1,000 day window, the rapidly developing brain is vulnerable to poor nutrition. Poor nutrition can damage the healthy development of the brain in two ways: first, directly through the absence of key nutrients required for proper cognitive functioning and neural connections and second, indirectly through the "toxic stress" experienced by a young child whose family has experienced prolonged or acute adversity, such as food insecurity.

PREGNANCY

During pregnancy, the human brain develops at an astonishing speed. It begins to grow very early on in pregnancy: the neural tube forms just 16 days after conception and by 7 months a child's brain takes on a form that resembles that of an adult's.[7] At the 4th week of pregnancy, the brain has an estimated 10,000 cells—by the 24th week, it contains 10 billion.

The nutrition that a baby gets from his mother through her diet is the indispensable fuel that drives much of this incredible transformation. Starting in pregnancy, nutrients are needed for the creation of new neurons, the cells that form the tissue that transmits and receives nervous impulses, and for the covering of axons with myelin, the fatty matter that accelerates the speed of nerve impulses traveling from one cell to another. Nutrients also fuel the formation of synapses, which provide the basis for learning ability. When a mother lacks adequate calories, protein, fatty acids or key micronutrients in her pregnancy, these vital neurodevelopmental processes can be impaired.[8]

Several nutrients play an important role in building the brain during pregnancy. These include iron, protein, copper, folate, zinc, iodine and certain fats.[9,10] Zinc, in particular, supports the development of the autonomic nervous system, the hippocampus and the cerebellum, while iron impacts the myelination of the nerve fibers which affects the brain's processing speed. Long-chain polyunsaturated fatty acids—typically found in breast milk, fish oils and egg yolks—play a central role in the healthy development and functioning of the brain and the eyes (see "The ABCs of Nutrition - Key Nutrients in the First 1,000 Days" chart).[11]

> Good nutrition during the first 1,000 days fuels the brain for learning.

A mother's diet and her nutrient stores are the only source of nutrition for the developing baby. When a pregnant woman does not get the calories, key nutrients or essential proteins she needs to support her baby's development, her baby is placed at risk for developmental delays, birth defects and cognitive deficits. For example, folate is critical to the early development of the brain and spine. When a woman lacks sufficient folic acid before becoming pregnant and in the early weeks of her pregnancy, the develop-

ment of the neural tube can go awry, leading to birth defects of the brain and spine (anencephaly and spina bifida) that can cause death or lifelong disability.[12]

INFANCY

Infancy is also a time of remarkable brain development and growth, which is primarily fueled by the nourishment a baby receives. During this time, the brain is developing motor functions such as balance, coordination and posture. This is also a critical time for hippocampal-prefrontal connections which enable the child to create and retrieve memories.[13]

When it comes to brain development, breastmilk is the ultimate superfood. Breastmilk contains a variety of nutrients, growth factors and hormones that are vital for a child's early brain development. Because breastmilk is a living substance with unique components that cannot be replicated in infant formula, its impact on brain development is unparalleled. Using neuroimaging technology, scientists have been able to see that children who were exclusively breastfed (no food or liquids other than breastmilk) for at least 3 months had increased white matter development in several brain regions, associated with executive functioning, planning, social-emotional functioning and language.[14]

A recent study followed pre-term infants from birth until later childhood and found that children who were fed more breastmilk within the first 28 days of life had larger volumes of certain regions of the brain and by age 7, had higher IQs and better scores in reading, mathematics, working memory and motor function tests.[15]

Breastmilk is nature's superfood.

Across all income levels, breastfeeding is consistently associated with higher performance on intelligence tests among children and adolescents. In particular, breastfeeding for 12 months or more is associated with a 3-point increase in IQ as well as higher educational attainment and income.[16] It appears that both the breastmilk itself as well as the experience of breastfeeding contributes to the healthy development of a child's brain. Babies' brains are shaped not only by the quality of the nutrition they get but also by the quality of the experiences and interactions they have with caregivers. Because the physical act of breastfeeding involves a great deal of mother-child interaction and nurturing, it plays an important role in strengthening a baby's sensory and emotional circuitry, which are critical for both cognitive and socio-emotional development.

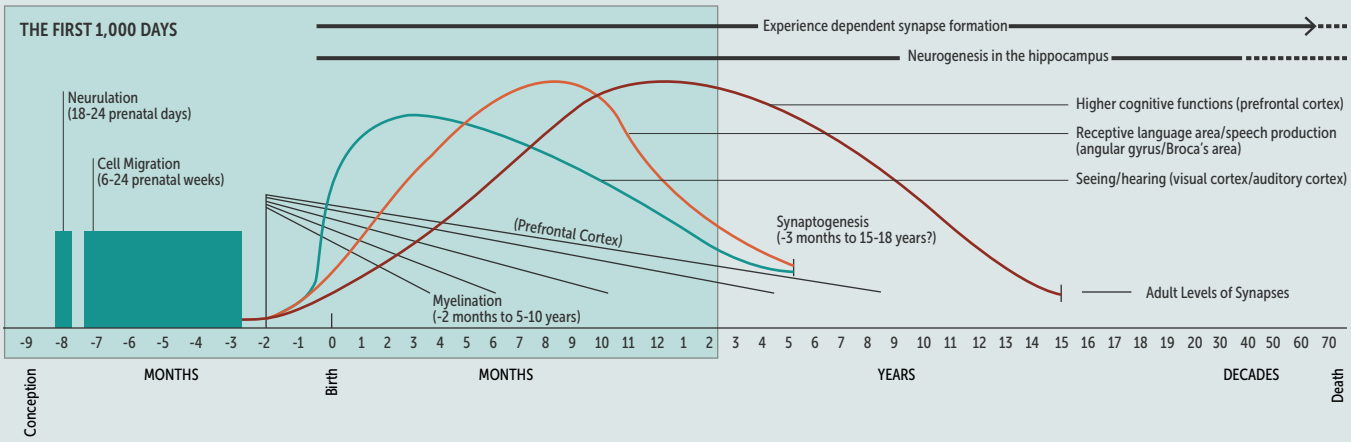
EARLY CHILDHOOD

In the toddler stage, a child's brain continues to grow and develop at a rapid pace. While a newborn's brain is only one-quarter of the size of an adult's, it grows to about 80% by age 3 and reaches 90% of adult brain size by age 5.[17]

The speed of a child's neural processing—that is, how quickly the brain can interpret and relay information—also increases dramatically during early childhood, enabling the young brain to perform more complex tasks. During this time, a young child's brain is busy forming synapses—the connections that allow neurons (brain cells) to communicate with one another. Throughout early childhood, a child creates synapses at a rate faster than at any other time in her life and creates more of them than she will need. In fact, a toddler's brain has up to twice as many synapses as it will have in adulthood. The excess of synapses produced by a child's brain during this stage makes the brain highly responsive to external input and gives it the ability to shape itself. This ability—known as neuroplasticity—enables human beings to adapt to changing environments and circumstances. Importantly, in the 2nd year of a child's life, synapses in the brain's language areas are developing and becoming more interconnected, leading to a surge in a child's language abilities.

Food provides the fuel for much of

THE DEVELOPMENTAL COURSE OF THE HUMAN BRAIN



Beginning before birth, the first years of a person's life are a period of remarkable brain growth and development. Different regions of the brain develop at different times during childhood and have the highest nutrient requirements when developing most rapidly—typically in the first 1,000 days. Furthermore, different brain processes such as myelination also have different nutrient requirements at different times. It is during the periods of peak growth when deficiencies in specific nutrients have the most detrimental impacts.[26]

ADAPTED FROM THOMPSON, R.A. AND NELSON, C.A. (2001) DEVELOPMENTAL SCIENCE AND THE MEDIA. EARLY BRAIN DEVELOPMENT. AM. PSYCHOL. 56, 5-15

the extraordinary brain development that takes place in early childhood, and nutrition during this period remains critically important. In particular, protein, iron, zinc and iodine are essential to the toddler's rapidly developing brain. Iron plays a significant role in brain development throughout the first 1,000 days, and the damage done by iron deficiency in pregnancy and the first 2 years of a child's life can be irreversible. Children ages 1 to 3 require 7mg[18] of iron daily, and unless toddlers are fed meat or other iron-rich foods, they are unlikely to consume enough iron. Iron deficiency in infants and toddlers can lead to impaired learning and social-emotional behavior, including less social interaction and alertness, increased irritability, wariness and inhibited behavior, and less interest in play.[19] This, in turn, can reduce the amount of attention and interaction given by caregivers and teachers, further contributing to poorer developmental outcomes. Iron deficiency also appears to affect the brain's neurochemistry, and studies have shown that early iron deficiency is associated with higher levels of anxiety and depression later in life with impacts for consequent job potential.[19,20,21,22]

While poor nutrition is toxic to the healthy development of young children, other factors in children's environments can also negatively affect how the brain develops. The plasticity of the young child's brain makes it particularly sensitive to elevated levels of stress hormones in ways that can harm its developing architecture.[23] For example, continued exposure to high levels of stress, such as that experienced by food insecure families, can alter a young child's stress-response system, leading to heightened arousal, which increases the risk of stress-related disorders later in life.[24,25]

Nutrition: A Foundation for Lifelong Health

Good nutrition throughout the first 1,000 days helps lay the foundation for a child's future health well into adulthood. There is a growing body of evidence that shows that a person's lifelong health—including his predisposition to obesity and other chronic diseases—is shaped by how well he is nourished in utero and during his early years as well as by other experiences. Emerging research also indicates that the effects of poor nutrition early in life impact not only a child's health but also that of the child's offspring. In this way, the damaging effects caused by poor nutrition in early life have the potential to cascade down through gen-

erations of children and lock families into a cycle of poor health.

PREGNANCY

Pregnancy is a critical period when the mother's health and eating habits have a significant impact on a developing child's metabolism, immune system, physical development and organ functioning. The roots of obesity and many adult diseases such as heart disease, type 2 diabetes, hypertension and stroke begin in pregnancy and are shaped by the nutrition a child receives (or doesn't receive) in utero. During pregnancy, the quality of a mother's diet, the rate at which she gains weight and her health and lifestyle habits are three of the most crucial factors that influence a child's future health.

The first of these factors, a healthy maternal diet of nutrient-rich foods, is essential for the optimal development and functioning of a baby's organs, metabolism, and musculoskeletal and cardiovascular systems. When women eat enough (but not too much) food high in protein, essential fats and vitamins and minerals during pregnancy, they are more likely to give birth to full-term babies and babies who are born at a healthy birth weight.[27] A child's weight at birth and whether she was born prematurely or full-term are important markers of her future health and development (see call out box "Birth Outcomes Matter").

A healthy baby starts with a healthy mother.

Remarkably, pregnancy is also a time when babies start to develop food preferences, setting them on a trajectory for either healthy or unhealthy eating habits. What a mother

BIRTH OUTCOMES MATTER

Low birth weight is a leading cause of infant mortality in the U.S. and elsewhere throughout the world. A baby is considered to be low birth weight when she weighs less than 5 pounds, 8 ounces at birth. There are two main reasons why a baby may be born with low birth weight:

Premature birth—that is, born before 37 weeks of pregnancy. The earlier a baby is born, the lower her birth weight may be.

Growth restriction during pregnancy (also called small for gestational age) is when a baby doesn't gain the weight she should before birth typically because something slowed or stopped her growth in the womb.

Poor maternal nutrition before and during pregnancy is recognized as an important risk factor for low birth weight.[30] There are other factors however that put babies at risk for low birth weight including: food insecurity, smoking, poverty, exposure to domestic violence, alcohol or substance abuse and environmental factors, such as air pollution and lead exposure. [31,32,33,34,35,36,37,38] And in the U.S., black mothers are more than twice as likely than their white counterparts to have low birth weight babies though researchers are not sure why.[39]

Low birth weight babies are at greater risk for long-term health and developmental problems. Evidence shows that there is a strong link between low birth weight and obesity, heart disease, and type 2 diabetes later in life. In a study examining the connections between newborn health and cognitive development, researchers found that birth weight was correlated with educational outcomes for children across all income groups.[40] The study's authors note that "while high-quality schools have the potential to improve the outcomes of all children, they do not reduce the gaps generated by poor neonatal health[41]".In this way, a child's school readiness begins before birth with the health of his mother.

SOURCES: CENTER FOR DISEASE CONTROL AND PREVENTION (CDC), MARCH OF DIMES

eats during pregnancy influences her child's preferences for certain foods as flavors from mom's diet get introduced to baby via the amniotic fluid.[28] For example, one study demonstrated that 6 month old infants were more likely to eat carrot-flavored cereal and less likely to express distaste when their mothers regularly drank carrot juice during the last trimester of pregnancy or the first 3 months of breastfeeding.[29]

The second factor, the rate at which a mother gains weight during her pregnancy, has a powerful influence on her child's lifelong health. There is a "goldilocks zone" for optimal weight gain during pregnancy—not too little and not too much—that helps ensure that babies develop on a healthy growth trajectory. A compelling body of evidence suggests that the origins of childhood obesity can be found in pregnancy. Researchers have found that high weight gain during pregnancy consistently and significantly increased the risk of childhood overweight and obesity.[42] Moreover, they found that women with high BMI (body mass index) *before* they become pregnant are more likely to have children with problems maintaining a healthy weight later in life.[43] Obesity in pregnancy also poses a threat to a baby's future health in other ways. For example, it puts women at risk for gestational diabetes—a condition in which women without previously diagnosed diabetes exhibit high glucose levels during pregnancy. Gestational diabetes alters the hormonal environment for a baby in utero in ways that negatively impact his development and make him more susceptible to obesity and type 2 diabetes later in life.[44]

Scientists are only just beginning to understand how the interplay of a person's genes and the environment in the womb affect lifelong health. The growing field of epigenetics explains that while we are pre-programmed by the DNA we receive from our parents, nutrition and other environmental and lifestyle factors can alter the way in which DNA is expressed (see call out box "The Science Behind Gene Expression...and Later Disease").[45,46]

There is a "goldilocks zone" for optimal weight gain during pregnancy—not too little and not too much—that helps ensure that babies develop on a healthy growth trajectory.

The third key factor, the health and lifestyle habits of the mother, exerts an important influence on her developing baby. If a mother is experiencing severe stress, depression or violence during her pregnancy, those negative

THE SCIENCE BEHIND GENE EXPRESSION...AND LATER DISEASE

Our external environment affects our genes, influencing our overall well-being as well as our susceptibility to disease. The study of how external factors, such as diets, affect our genes—both by causing them to turn 'on' and 'off' and by impacting the way our cells express genes—is called epigenetics. The first 1,000 days is a particularly critical period in which external and environmental factors, such as the food a pregnant mother eats or the home in which a baby lives, can actually alter a young child's biology. In fact, a person's cells are effectively programmed in childhood for how they will respond to their environment throughout the remainder of their life. There is also evidence to suggest that some epigenetic changes can be passed down from one generation to the next. In this way, what a child experiences in her first 1,000 days may impact not only her development and health throughout her life, but also potentially that of her children's as well.

There is a growing body of research that suggests that heart disease, obesity, type 2 diabetes and behavioral health problems may have their origins in epigenetic changes during pregnancy and that nutrition plays a key role in these changes.[48] In one recent groundbreaking study, scientists discovered that nutritional deficiencies in a mother's diet as well as her weight status at the time of conception can permanently alter her baby's genes.[49]

Ultimately, epigenetics adds to our understanding of the importance of good nutrition and healthy environments for young children. It also brings new urgency to the need for action during the first 1,000 days as improvements in the nutrition of one generation could help prevent increasingly common diseases in future generations.

experiences can "imprint" themselves on her developing child. Smoking during pregnancy can slow the rate of a baby's growth and contribute to babies being born too small or too soon (low birth weight or preterm). Yet paradoxically a baby whose mother smokes during pregnancy is at a much greater risk of obesity later in life.[47] Similarly, alcohol and drug use during pregnancy have strong negative impacts on the future well-being of a developing child.

INFANCY

Infancy is a critical period when babies learn what and how to eat. It is also a time when their palates are trained and lifelong eating habits begin to form. When it comes to nutrition during infancy, breastmilk is the biological norm. While mothers have been breastfeeding their children since our species was born, we have only recently begun to fully understand the powerful role that breastfeeding plays in the health and development of infants and toddlers.

In addition to the brain-building benefits it provides, breastfeeding gives babies the healthiest start to life. The nutritional and immunological properties unique to breastmilk help protect babies from infection and illness. Breastfeeding is key to helping reduce infant mortality as breastfed infants are less likely to die as a result of Sudden Infant Death Syndrome (SIDS)—a leading cause of infant mortality in the U.S.—as well as respiratory infections and necrotizing enterocolitis, which is a devastating condition mainly affecting premature babies.[50] There is also now compelling evidence showing that a longer duration of breastfeeding is associated with lower risk for overweight, obesity and type-2 diabetes later in life.[51] It is not just the babies who benefit from breastfeeding. For every year a mother breastfeeds, she significantly reduces her risk of developing ovarian cancer, invasive breast cancer and heart disease.[52,53] A mother's health plays an important role in her child's well-being and impacts her ability to provide her children with nurturing care.

Breastfeeding also facilitates a naturally "responsive style" of meeting babies' needs. With responsive feeding, a parent or caregiver attends to a child's signals of hunger or fullness and responds appropriately.[54] Through breastfeeding, a mother can learn to allow her baby to guide her as he regulates his own intake of food and learns to stop eating when he feels full—a skill that is important throughout life.

Because of these extraordinary health benefits, the World Health Organization (WHO), the American Academy of Pediatrics (AAP) and the American Congress of Obstetricians and Gynecologists (ACOG) recommend that babies be exclusively breastfed (i.e. fed only breastmilk with no solids or other liquids except vitamin/mineral supplements) for the first 6 months, followed by continued breastfeeding for at least 1 year alongside the appropriate introduction of complementary foods.*

Unfortunately, many women are un-

LINN-JEFF
VIA FACEBOOK

"I felt the greatest joy while breastfeeding my girl. I almost quit trying the first two days at the hospital, it was so hard, but I am so glad I didn't."

* WHO RECOMMENDS EXCLUSIVE BREASTFEEDING FOR 6 MONTHS, FOLLOWED BY CONTINUED BREASTFEEDING WITH APPROPRIATE COMPLEMENTARY FEEDING UNTIL 2 YEARS OR BEYOND

able to meet the recommendation to exclusively breastfeed for 6 months primarily because they lack the support to do so. Moreover, many parents and caregivers introduce babies to solid foods too early. There is evidence that babies who began to eat solid foods before the age of 6 months are at greater risk for chronic diseases such as obesity, diabetes and celiac disease.[55]

A person's lifelong health—including his predisposition to obesity and other chronic diseases—is shaped by how well a child is nourished during the first 1,000 days.

In addition to the timing of the introduction of solid foods, the kinds of foods offered to babies is important. Infants need to eat nutrient-rich foods, especially those containing Vitamin D, iron and zinc, in order to help fuel their growth.[56,57,58,59,60] Foods that are high in added sugar, salt and saturated fats should not be part of an infant's diet. Not only do these kinds of foods contribute to rapid weight gain in infancy, which is a risk factor for overweight and obesity later in childhood, but they can also "program" a baby's taste buds to prefer very sweet, salty or fatty foods.[61,62] In fact, infancy is a golden window of opportunity to influence a child's preference for healthy foods. While a mother's diet begins to shape a baby's taste preferences in utero, babies who are breastfed continue to be exposed to a wide range of flavors from their mothers' diet through her breastmilk. This plays a key role in determining what foods are familiar to and thus preferred by the baby.[63]

EARLY CHILDHOOD

Many experts believe that early childhood is the best time to establish healthy eating habits. To fuel their growth, a toddler needs to eat a variety of protein-rich foods, fruits and vegetables, whole-grains, unsweetened milk and other dairy products, while limiting the amounts of saturated fats, sugars, and sodium they consume.[64] A healthy diet is essential to ensuring a child grows well and gains an appropriate amount of weight.

The consequences of poor diet and eating habits during early childhood are significant. Rapid weight gain throughout the first 2 years of life is associated with later childhood overweight and other serious negative health outcomes throughout life.[65,66] The science suggests that in young children, obesity may be a life sentence. One study showed that children who became obese as early as age 2 were more likely to be obese as adults.[67] Another study found that young children who were ever overweight throughout early childhood were more than 5 times as likely to be overweight at age 12 than those who were not overweight.[68]

As toddlers are introduced to the adult diet, it is especially important that they have opportunities to learn to like and eat healthy foods. There are a number of factors that influence the development of eating behaviors in young children.[69] First, research shows that the more opportunities children are given to sample unfamiliar foods, the more likely they are to like and accept such foods.[70] Second, context matters for children's consumption of healthy foods. During meal times, young children need loving attention from adults and a positive atmosphere free of pressure to eat. The AAP recommends that parents and caregivers employ a responsive style of feeding whereby they teach young children to regulate their own intake of food. Research indicates that non-responsive feeding practices, such as encouraging young children to eat more, or using food as a means to control behavior, are associated with overeating and weight gain.[71] The AAP also recommends establishing routines for meals and snacks on a predictable schedule, minimizing mealtime distractions such as TV and smartphone use and avoiding using food as a reward or punishment for behavior. Third, observational learning is powerful with children in this age group; young children are motivated to imitate what they see their caregivers doing. Young children are most likely to develop healthy eating habits when parents and other caregivers model tasting of new foods.[72] Given that children have an innate tendency to imitate the behavior of others, par-

ALOISE
GRANDMOTHER OF
20 MONTH OLD
KENTUCKY

"I have cooked vegetables just about every which way but he just won't eat them."

ents' consumption has been shown to be a strong predictor of their child's intake of fruit and vegetables.[73]

Nutrition: A Foundation for More Equal Beginnings

Good nutrition in the first 1,000 days gives children a fair start to life and puts them on track to thrive. But too many children don't get this opportunity. They grow up in unstable or unsafe homes, they aren't well cared for or lack nurturing or they don't get the nourishment needed for their bodies and brains to grow. Unfortunately, this is the reality for many young children who live in poverty or struggle with food insecurity or other hardships, and these challenges are often felt even more acutely in families of color.

The science of early brain development provides a powerful lens to better understand the effects of poverty on children. In a recent study, researchers discovered that the brains of children from the lowest income bracket (income under $25,000 a year) had up to 6% less surface area than did those of children from families making more than $150,000.[74] The findings were consistent with previous research that found the brains of low-income one-month olds were smaller than the brains of their wealthier counterparts. While researchers have not yet pinpointed the cause for these striking differences in brain sizes, they suspect that early life nutrition plays a key role.[75] This and other research suggests that inequalities in child development often begin before a child is even born.[76]

Throughout the first 1,000 days, the well-being of the mother and her child are intertwined. In this way, the stress associated with chronic poverty and food insecurity not only harms the health of the mother, but also negatively affects her baby's development.[77,78] Studies show that fetal exposure to elevated levels of stress hormones can lead to long-term negative outcomes such as cognitive delays, attention disorders, trouble in school and emotional problems.[79,80] Furthermore, prenatal stress can alter the development of the baby's own stress system and affect the child's ability to cope with stress for the rest of his life.[81] The additional stress placed on mothers and other caregivers as they struggle with economic instability can actually diminish the quality of their interactions with their infants and toddlers and create additional risk to the child's development.[82,83] How well and how long mothers are able to breastfeed appears to be correlated with a woman's income and education. Wealthier and more educated women tend to breastfeed more and longer. This could be due to the fact that college-educated women are more likely to have jobs with paid maternity leave.

Infants and toddlers growing up in homes that are food insecure or face chronic poverty are vulnerable to "failure to thrive"—a condition in which children do not grow as fast or gain weight at the same rate as healthy children. The damage done to a child's brain and body when he fails to thrive can be irreversible and young children who fail to thrive are at serious risk for developmental problems later in life.

Even at low levels of severity, food insecurity can have long-lasting impacts on developing children, compounding the effects of other risk factors associated with poverty, such as reduced access to health care and unstable or unsafe housing.[84] During pregnancy, food insecurity can be a risk factor

for gestational diabetes and low birth weight, both of which impact the future health and development of children.[85] Researchers have found that food insecure infants and toddlers are 2/3 more likely than their food secure peers to be at risk for developmental delays.[86] In addition to impacting their cognitive development, food insecurity puts young children at greater risk for behavioral and emotional problems, which can also undermine their ability to succeed in school.[87,88]

There is evidence that shows that children born to parents with lower education levels and lower household incomes are also at greater risk for overweight and obesity.[89] Conditions that are common in low-income and food insecure households—food shortages, reliance on calorie-rich, nutrient-poor foods to stretch food dollars, stress and depression—are all risk factors for unhealthy weight gain. Parents in low-income families may also be hard-pressed to provide an attentive atmosphere for meals with toddlers. The daily stresses they face in juggling financial worries, work demands, child care arrangements, health concerns, poor-quality housing and unsafe neighborhoods may make it difficult for them to fully engage with their toddler at mealtimes, let alone prepare a nutritious meal. Interestingly, one study of U.S. families showed that young children from *middle-income* families had higher odds of overweight than young children from high-income families.[90] Researchers are not sure why there is a strong association between weight and family income but believe it may have to do with food choices. In early childhood, budget constraints can affect how often parents and caregivers encourage children to try new foods. Research shows that, where infants and toddlers are concerned, new foods often must be offered multiple times before the child will overcome his natural aversion to the unfamiliar tastes and appearance of new items.[91] Given the waste and expense of repeatedly offering foods that children may reject, lower-income parents appear to be more likely to give children foods they know they will eat (even when those are less healthy or nutritious). In contrast, more affluent families can afford to introduce new foods on multiple occasions, even if they go uneaten, and their children are more likely, ultimately, to accept many of these.[92]

KATHY
MOTHER OF 6 MONTH OLD
KENTUCKY

"The first week after payday, the fresh produce goes. The second week we have more processed foods, like spaghetti with canned meat sauce. We'll have more cheap, convenient meals the second week than the first."

Poor nutrition can make a family's climb out of poverty that much more difficult.

These socio-economic barriers to good health and nutrition contribute to unequal starts for children. In this way, poor nutrition contributes to a multigenerational legacy of health and developmental disparities and can make a family's climb out of poverty that much more difficult. The best time to prevent these kinds of inequalities from perpetuating themselves is early in a child's life—before these trajectories have been established, starting in the first 1,000 days.

A Healthy First 1,000 Days Starts with Good Nutrition

The science is clear about what children need during the first 1,000 days in order to grow, learn and thrive. Using the research and scientific evidence that we have just reviewed along with recommendations from WHO, AAP and other leading experts, we have identified a set of 10 "building blocks" for good nutrition in the first 1,000 days. These building blocks represent what every child needs to have the strongest start to life and all 10 of them are essential to healthy growth and development.

The 10 Building Blocks for Nutrition During the First 1,000 Days

1. A nutritious diet for mothers during pregnancy
2. Good care for all mothers during pregnancy
3. Exclusive breastfeeding for the first 6 months
4. Nurturing, responsive care and feeding of babies and toddlers
5. The right foods introduced to babies at the right times
6. A healthy and nutritious diet for babies and toddlers
7. Water and other healthy beverages with no added sugars for toddlers
8. The right knowledge and skills for parents and caregivers to properly nourish young children
9. Consistent access to enough nutritious food for families of young children
10. Societal investments in the well-being of every baby and toddler

THE ABCS OF NUTRITION–KEY NUTRIENTS IN THE FIRST 1,000 DAYS

	ROLE IN THE BODY	CONSEQUENCES OF DEFICIENCY	VITAL TIME PERIODS DURING THE FIRST 1,000 DAYS	DIETARY SOURCES*
Vitamin A	Critical for vision, supports cell growth and differentiation, playing a key role in the normal formation and maintenance of the heart, lungs, kidneys and other organs, immune function	Damage to the eyes, poor growth, loss of appetite, susceptibility to infections. Vitamin A deficiency is rare in the United States.	Pregnancy, infancy, early childhood	Egg yolks, yellow and dark green leafy vegetables and fruits such as spinach, kale, broccoli, sweet potatoes, pumpkin, liver
Vitamin B6	Essential for normal brain development and function, development of neurotransmitters, chemicals that carry signals from one nerve cell to another, helps the body make the hormones serotonin and norepinephrine, which influence mood, and melatonin, which regulates the body clock.	Muscle weakness, irritability, depression, difficulty concentrating	Pregnancy, infancy, early childhood	Meat, liver, fish, chicken, potatoes and other starchy vegetables, bananas
Vitamin B12	Essential for cell health, aids in the production of DNA, the genetic material in all cells, together with folic acid, helps make red blood cells and helps iron work better in the body	Increased risk of birth defects such as neural tube defects, may contribute to preterm delivery, increased risk of poor cognitive function, failure to thrive	Pregnancy, infancy, early childhood	Meat, fish, poultry, eggs, milk and cheese
Calcium	Bone growth and health, tooth development and function, blood clotting, maintenance of healthy nerves and muscles	Greater risk of rickets, a disease characterized by swollen joints and poor growth, increased risk of bone fractures, increased vulnerability to the adverse effects of lead	Pregnancy, infancy, early childhood	Milk, cheese, yogurt and other dairy products, salmon, calcium fortified foods

* IN GENERAL, HEALTHY, FULL-TERM BREASTFED INFANTS RECEIVE AN ADEQUATE AMOUNT OF ALL OF THESE NUTRIENTS WITH THE POSSIBLE EXCEPTIONS OF VITAMIN D AND IRON.

	ROLE IN THE BODY	CONSEQUENCES OF DEFICIENCY	VITAL TIME PERIODS DURING THE FIRST 1,000 DAYS	DIETARY SOURCES*
Choline	A critical component of the cell membrane, choline is necessary for the normal function of all cells, critical during pregnancy for the development of the brain, where it can impact neural tube closure and lifelong memory and learning functions	Reduced blood vessel growth in baby's brain in utero, increased risk for brain and spinal-cord defects, nerve and muscle problems, may make folate deficiency more likely	Pregnancy, infancy	Meat, seafood, liver, egg yolks, broccoli and brussels sprouts, breastmilk also has high concentrations of choline
Copper	Required in only small amounts, copper is needed for the proper growth and development of bones, brain, heart and other body organs, works with iron to form red blood cells, stimulates immune system to promote healing	Increased risk of low birth weight, muscle weaknesses, neurological problems, anemia, poor growth, metabolic problems, greater risk of infection	Pregnancy, infancy, early childhood	Liver, shellfish, lentils and other beans, nuts, whole grains, dark leafy greens
Vitamin C	Essential to forming collagen, a protein that gives structure to bones, muscle and other connective tissue, plays an important role in immune function and body's ability to resist infections, enhances the absorption of iron	Can lead to scurvy, a serious disease which in infants can cause poor bone growth, bleeding, and anemia, bleeding gums	Pregnancy, infancy, early childhood	Citrus fruits, tomatoes, red and green peppers, broccoli, potatoes
Vitamin D	Critical to bone growth and health, key to a healthy immune system and immune response, promotes calcium absorption	Bones can become thin, brittle or misshapen, causes rickets in children, a disease characterized by swollen joints and poor growth	Pregnancy, infancy, early childhood	Vitamin D is produced by the skin when exposed to sunlight. Food sources of Vitamin D include: fortified milk, fish, liver, egg yolks. Breastmilk typically contains little Vitamin D and it is recommended that either breastfeeding mothers or breastfeeding infants take a Vitamin D supplement.

	ROLE IN THE BODY	CONSEQUENCES OF DEFICIENCY	VITAL TIME PERIODS DURING THE FIRST 1,000 DAYS	DIETARY SOURCES*
Folate	Essential for the proper development of a baby's brain and spinal cord, required for cell division, growth and the development of healthy blood cells	Greater risk of neural tube defect—a birth defect in which spinal cord does not close properly leading to learning disability, paralysis and babies being born with little to no brain	Before pregnancy, pregnancy	Green leafy vegetables such as spinach and broccoli, beans, certain fruits such as bananas and melons, beef liver, fortified breads and cereals. In 1998, the U.S. Food and Drug Administration (FDA) began requiring manufacturers to add folic acid to breads, cereals, flours, cornmeals, pastas, rice and other grain products.
Iron	Critical for the proper brain development and function in young children, delivers oxygen to tissues, contributes to regulation of immune function and metabolism	Extreme fatigue and depression, impaired cognitive development, reduced resistance to infection	Pregnancy, infancy, early childhood	Eggs and meat, dark leafy vegetables such as spinach, legumes (e.g. beans, lentils), whole grains, fortified breads and cereals. Full-term, healthy babies typically receive enough iron from their mothers in the third trimester of pregnancy to last for the first four months of life. Exclusively breastfed babies may need to receive an iron supplement starting at four months.
Iodine	Brain development, essential component of thyroid hormone	Impaired brain function, delayed development	Pregnancy, infancy, early childhood	Iodized table salt, dairy products, eggs, saltwater fish and seafood
Vitamin K	Plays a key role in helping the blood clot, preventing excessive bleeding	Increases the risk of uncontrolled bleeding, Vitamin K deficiency bleeding can potentially result in gross motor skill deficits, long-term neurological, cognitive or developmental problems, organ failure or death.	Newborn, early infancy	Because all babies are born Vitamin K-deficient, a single injection of Vitamin K administered at birth is standard practice in the U.S.

ROLE IN THE BODY | CONSEQUENCES OF DEFICIENCY | VITAL TIME PERIODS DURING THE FIRST 1,000 DAYS | DIETARY SOURCES*

Long-Chain Polyunsaturated Fatty Acids
These fats, particularly DHA, play a major role in brain development and health. DHA is a major component of retinal and brain tissues, necessary for the formation of healthy cell membranes and support growth and immunity
Poor weight gain, lowered immunity, poor attention span, hyperactivity, or irritability, problems learning
Pregnancy, infancy
Fresh fish and fish oils are ideal sources of LC-PUFAs. Cold water/oily fish such as salmon, mackerel, herring, tuna, sardines, anchovies are high in LC-PUFAs, some seeds and nuts such as flax seeds and walnuts, breastmilk contains small but significant amounts of LC-PUFAs that are necessary for optimal development of the brain, the retina and other infant tissues
Protein
Essential component of all cells in the body, muscle tissue, organs and neurotransmitters in the brain, critical for proper brain development, regulates metabolism
Fatigue, increased infections, muscle weakness, failure to thrive
Pregnancy, infancy, early childhood
Eggs, meat, poultry, fish, legumes (e.g. dry beans, peas, nuts), milk and dairy products
Selenium
Needed only in small amounts, selenium plays a critical role in thyroid hormone metabolism and DNA synthesis, essential for brain health, immune system
Poor growth
Infancy, early childhood
Seafood, beef, poultry, eggs
Zinc
Essential for cell growth and metabolism, supports healthy growth and brain function, immune system, bone growth
Decreased fetal movement and heart rate variability during pregnancy, possible increased risk of preterm birth, increased risk of infection, poor growth in children
Pregnancy, infancy, early childhood
Red meat, poultry, whole grains, milk and dairy products, oysters

SOURCES: WORLD HEALTH ORGANIZATION AND FOOD AND AGRICULTURE ORGANIZATION, VITAMIN AND MINERAL REQUIREMENTS IN HUMAN NUTRITION, 2004; NATIONAL INSTITUTES OF HEALTH (NIH), PEDIATRIC NUTRITION HANDBOOK, AAP 2009

PART 2

A Look at the First 1,000 Days in the U.S.

Having made the case for why nutrition during the first 1,000 days matters at both an individual and societal level, we now turn our attention to what early nutrition looks like in America. By several measures of health and nutrition, mothers, infants and toddlers in the U.S. are not faring particularly well. The U.S. has one of the highest infant mortality and maternal mortality rates of any wealthy country.[93,94] The U.S. also ranks among the world's worst performing countries with respect to 2 of the 6 global nutrition targets put forward by WHO: rates of exclusive breastfeeding and overweight in children under age 5.[95] In the U.S., 1 in 5 infants are never breastfed[96] and 1 in 4 children are overweight or obese by their 5th birthday.[97] On a third global nutrition target—reducing the number of babies with low birth weight—the U.S. rates second to last among its rich country peers and has made very little progress in reducing levels of low birth weight in recent years.[98]

Moreover, the American diet is unhealthy by many measures.[99] The U.S. consumes more calories per capita per day than any other country in the world, and American diets are higher in saturated fats and lower in fresh fruits and vegetables than other high income countries.[100] There is a broad consensus that America's unhealthy eating habits are a major contributor to our nation's current epidemic levels of obesity and diet-related diseases, leading experts to suggest that, "this generation of children could be the first…to live less healthful and shorter lives than their parents."[101]

While the problem of poor nutrition in the first 1,000 days is pervasive across America, the burden falls hardest on low-income families and communities of color, leading to a concentration of poor health and educational outcomes in these populations. The costs to society, however, impact all Americans. Experts estimate that the health-related costs of food insecurity in America is $160 billion[102]—more than a third of the U.S Government's budget deficit. Pre-term births alone are estimated to cost the U.S. over $26 billion per year.[103] Poor nutrition even impacts our national security. According to the non-profit organization Mission: Readiness, 1 in 4 young Americans are too overweight to join the U.S. military.[104]

When reviewing the data and evidence, it becomes clear that there are four main areas where greater attention is urgently needed to improve the prospects for the next generation of America's children: (1) maternal diet and health (2) breastfeeding (3) infant and toddler diets and (4) support for vulnerable families.

The Prenatal Principle: Maternal Diet and Health

A growing body of research indicates that the health problems caused by poor diets are being passed down from parents to their children. Poor diets are particularly problematic during pregnancy as a baby growing in the womb gets most of his nutrition from what his mother eats. Surprisingly, there is little data about American women's nutritional health during pregnancy. It is unclear, for example, how many American women of child-bearing age are deficient in iron—a nutrient vital for a child's brain development in utero—though estimates of women suffering from iron deficiency anemia range from 12% to 20%.[105] Data from a 2007 survey indicates that only 12% of reproductive-age women in the U.S. reported knowing that folic acid should be taken before pregnancy, and only 40% of women surveyed reported taking it daily.[106] Meanwhile, one study of over 100 new parents found that only 2% to 16% of mothers met recommended overall daily dietary guidelines.[107]

As discussed in Part 1, the children of mothers who maintained a healthy weight before and during pregnancy are less likely to suffer from obesity later in life. Unfortunately, large numbers of women in the U.S. are not entering pregnancy at a healthy weight or are gaining too much weight during pregnancy. Half of American women are overweight or obese when they enter pregnancy, and nearly half of women gain more weight during pregnancy than is recommended.[108,109] As rates of obesity in women continue to climb in the U.S., it is expected that an ever-growing number of women will struggle with obesity and overweight in pregnancy.[110] In addition, the significant socioeconomic and racial disparities in maternal obesity rates will only perpetuate existing inequalities into the next generation. At present, lower income women in general, particularly black and Hispanic women, enter pregnancy with disproportionately higher than recommended weights.[111] Over 80% of black women over the age of 20 are either overweight or obese.[112]

Health providers play a key role influencing mothers' behaviors around healthy eating, appropriate weight gain and other habits during pregnancy that impact the long-term development and well-being of children. Yet, according to one measure, only about 2/3 of pregnant women receive "adequate" prenatal care.[113] In another sample of mothers from 8 states, only about 1/3 of women reported receiving pre-pregnancy guidance from a medical provider on how to prepare for a healthy pregnancy and birth; and among Hispanic women, only about 1/4 reported receiving such advice.[114]

Half of women in the U.S. are overweight or obese when they enter pregnancy, and nearly half of U.S. women gain more weight during pregnancy than is recommended.

Prenatal care depends largely on the availability of and access to health care and insurance coverage. In 2010, approximately half of the counties in the U.S. lacked even one practicing obstetrician or gynecologist.[115] Overall, 13% of women ages 19-64 were uninsured in 2014.[116] Moreover, insurance coverage is not always a guarantee that pregnant women are able to access care. One in 7 pregnant women report that they or someone in their family had to delay or forgo medical care in the past 12 months; among poor and low-income women this ratio is closer to 1 in 4.[117]

A Societal Responsibility: Breastfeeding

Too few mothers and children in the U.S. are benefitting from breastfeeding despite its critical role in brain development, healthy growth and obesity prevention and reduced risk of illness and infection. In fact, the majority of

U.S. children are not breastfed in accordance with the AAP and WHO recommendations. By 3 months of age, just 44% of U.S. infants are exclusively breastfed; at 6 months of age, only 22% are exclusively breastfed.[118]

Perhaps the statistic that best illustrates the problem with breastfeeding in America is that among women who choose to breastfeed, only 6 in 10 do so for as long as they had initially planned.[119] The reasons why women avoid or stop breastfeeding vary, but it is clear from the research that women who want to breastfeed need stronger support from their families, communities, health care providers and employers.[120] The world-renowned medical journal *The Lancet* recently concluded that "success in breastfeeding is not the sole responsibility of a woman—the promotion of breastfeeding is a collective societal responsibility."[121]

Almost 20% of babies in the U.S. are never breastfed.

One key reason why women stop breastfeeding earlier than anticipated is that they lack access to counselors, lactation consultants and other healthcare professionals trained in breastfeeding support. To a large extent, women rely on their physicians for help with breastfeeding; yet, in many cases, doctors underestimate their influence on breastfeeding and report having insufficient knowledge and low clinical competence in breastfeeding.[122] And while the number of International Board Certified Lactation Consultants (IBCLCs) has increased rapidly in recent years, in 2013 there were only 3.79 IBCLCs per 1,000 live births.[123, 124] Similarly, only 18% of the annual 716,000 births in the U.S.

RAISING THE BAR: MAKING HOSPITALS BABY-FRIENDLY

The Baby-Friendly Hospital Initiative (BFHI) is an effort spearheaded by the WHO and the United Nations International Children's Fund (UNICEF) to help all hospitals and birthing facilities become centers of breastfeeding support. It recognizes hospitals and birthing facilities who successfully implement the 10 Steps to Successful Breastfeeding (see below) and the International Code of Marketing of Breastmilk Substitutes. The BFHI assists hospitals in providing mothers the information, confidence and skills necessary to successfully initiate and continue breastfeeding their babies or use formula safely.

10 STEPS TO SUCCESSFUL BREASTFEEDING

1. Have a written breastfeeding policy that is routinely communicated to all health care staff.
2. Train all health care staff in skills necessary to implement this policy.
3. Inform all pregnant women about the benefits and management of breastfeeding.
4. Help mothers initiate breastfeeding within one hour of birth.
5. Show mothers how to breastfeed and how to maintain lactation, even if they are separated from their infants.
6. Give newborn infants no food or drink other than breastmilk unless medically indicated.
7. Practice "rooming in"—allow mothers and infants to remain together 24 hours a day.
8. Encourage breastfeeding on demand.
9. Give no pacifiers or artificial nipples to breastfeeding infants.
10. Foster the establishment of breastfeeding support groups and refer mothers to them on discharge from the hospital or clinic.

SOURCE: WWW.BABYFRIENDLYUSA.ORG

SHANNON
MOTHER
VIA FACEBOOK

"I am one of the 'lucky' ones. My company allowed me six weeks of paid medical leave, not maternity leave. Medical leave for the required time that my body needed to physically heal from giving birth....I then used all my allotted sick and vacation time so I could be home 10 weeks with my baby, who I was exclusively breastfeeding because we could not afford the cost of full-time formula feeding. I could [have stayed at home] if I had chosen, but it would have been with zero pay and I would have lost my medical benefits for my entire family.

When I returned to work...my milk supply dramatically dropped and we then had to begin supplementing with formula... It was at this time that I realized how much my baby still needed me and how much I still needed my baby.

'Paid Maternity Leave' is about more than just 'staying home' with our children. It's about laying the stable foundations they will need in the first 12 months of their lives. I would have happily returned to work after one year home with my child [and] would have happily paid into a 'leave account' to do so as well."

occur in hospitals and birthing centers that are designated as "Baby-Friendly"[125] —an internationally recognized certification that ensures that mothers in health facilities are optimally supported to breastfeed. In a report on maternity care practices to support breastfeeding, the CDC found that in 2013, 26% of hospitals reported routinely feeding infant formula or other liquids to healthy, breastfed newborns when there was no medical reason or parental consent to do so. Sadly, the percentage of American hospitals that engage in this practice has been growing since 2007.[126]

Another major driver of low breastfeeding rates in the U.S. is the lack of paid maternity leave.[127] There is clear evidence that maternity leave is associated with higher rates and longer durations of breastfeeding.[128,129] Maternity leave can also help reduce infant mortality and illness, increase the likelihood of timely pediatric care and reduce the likelihood of maternal depression, which impacts mothers' ability to nourish and nurture their children.[130]

The U.S. is the only major economy in the world without a national policy guaranteeing women paid time off to care for their newborn children.[131] While the federal Family and Medical Leave Act (FMLA) allows employees to take up to 12 work weeks of leave for qualifying medical and family reasons (including pregnancy or care of a newborn child), it does not require *paid* time off from work, nor does it apply to employers with less than 50 employees. Just half of American workers are covered by FMLA, and even fewer can afford to take it because leave can be unpaid or only partially paid. As a result, many women in the U.S. are forced to choose between taking time off to provide the best care for their infants and earning the income they need to support their families.[132]

The U.S. is the only major economy in the world without a national policy guaranteeing women paid time off to care for their newborn children.

Overall, only 41% of U.S. mothers receive paid time off to care for their newborn child.[133] According to a 2015 analysis, the lack of access to paid leave means that 1 in 4 women in the U.S. return to work just 2 weeks after giving birth, putting their health and that of their infant at risk.[134,135] Access to employer-sponsored paid leave in the private sector is particularly low—only about 12% of employees have access.[136] Among the lowest-paid quintile of the U.S. workforce, only 5% of Americans have employer-sponsored paid leave.[137]

Many women who choose to breastfeed must balance the competing demands of employment and breastfeeding.[138] Employers who recognize the importance of breastfeeding by providing adequate workplace supports, such as paid time off and nursing breaks, help mothers succeed in breastfeeding.[139] One study found support for policies that allow flexible work schedules: when mothers were able to work at home for an extra 8 hours per workweek, their likelihood of breastfeeding for at least 6 months increased by 17%.[140]

Finally, social norms around infant feeding exert a powerful influence on whether or not a mother chooses to breastfeed and for how long. Despite the fact that AAP's policy statement on breastfeeding clearly states that "infant nutrition should be considered a public health issue"—and not dismissed as simply a "lifestyle choice"—Americans view it differently.[141] In an nationally-representative online survey of over 500 mothers in the U.S. conducted by 1,000 Days and Harris Poll in 2014, 85% of respondents reported having been encouraged to breastfeed by their healthcare provider; however, 83% also reported having been advised that formula feeding was fine, suggesting that healthcare providers didn't acknowledge any benefits to breastfeeding over formula feeding. Similarly, over 80% of mothers surveyed said they were encouraged to breastfeed by family and friends, but 80% were also told by family and friends that giving formula was fine. The belief that formula feeding is "just as good" as breastfeeding is perpetuated by the pervasive and aggressive marketing tactics of the major manufacturers of infant formula. One such tactic involves providing free samples of infant formula to new mothers in maternity facilities and hospitals. Since they receive these free samples at a health facility, it is easy for new moms to assume that formula feeding is recommended by doctors and other healthcare professionals. It is estimated that nearly 1/3 of American hospitals allow this practice despite it being expressly prohibited by the WHO International Code of Marketing of Breastmilk Substitutes (The Code) as it has been consistently shown to serve as a deterrent to successful breastfeeding.[142]

Feeding the Future: Infant and Toddler Diets

Older infants and toddlers need diverse, nutritious foods to fuel their growth and development. Yet the current diets and eating habits of young children in the U.S. may be setting the stage for a lifetime of health problems. Analyses of the diets of America's infants and toddlers paint a troubling picture. Researchers found that on any given day, a young child in America is more likely to get sweets or sugar-sweetened beverages than a serving of fruit or a vegetable.[143] A study that analyzed over a decade of dietary patterns in children from birth to 2 years in the U.S. found that only 40% of infants and toddlers regularly eat vegetables.[144] In fact, the most common vegetable eaten by American toddlers, starting as early as age 1, is the French fry.[145] This "nutritional tragedy", as *New York Times* columnist Nicholas Kristof recently put it, is compounded by the fact that desserts, cookies, candy and sugar-sweetened beverages are introduced to babies as young as 4 months.[146,147] Over 40% of American infants and over 70% of toddlers eat some type of dessert, sweet or sugar-sweetened beverage at least once a day.[148]

In many ways, the diets of young children mirror the adult American diet—low in fruits and vegetables and high in sugar and saturated fats. And like most American adults, our babies and toddlers are likely consuming an "excessive" amount of calories.[149] The high level of added sugars in the diets of young children—particularly from sugar-sweetened beverages—is a serious cause for concern. Sugar-sweetened beverages are a major source of calories but provide little nutritional value and do not satisfy children's appetites the way that solid food does. Moreover, sugar-sweetened beverage intake among toddlers was found to be associated with greater weight gain.[150] One study found that 4 and 5 year olds who drank at least one sugar-sweetened beverage per day were more likely to be overweight or obese than their peers who didn't consume these

DONTAE
MOTHER OF 17 MONTH OLD
MISSISSIPPI

"They tried to give me that [a bag of formula samples]. At 3 o'clock in the morning, if you're having a problem latching and they send you home with the formula you're going to go to the formula. So it's like you're setting us up for failure."

ENVIRONMENTS MATTER: IMPROVING ACCESS TO SAFE WATER

Improving access to drinking water is an important strategy to reduce the consumption of sugar-sweetened beverages and the growing rates of obesity and overweight in young children.[161] Yet, in many communities throughout the U.S., clean and safe drinking water is not always easily available at home, in daycare or preschool settings or playgrounds.[162] Moreover, greater action is needed to ensure that communities, schools and daycare sites are testing their water supplies to ensure they are safe.

The troubling revelation that the residents of Flint, Michigan had been unknowingly exposed to highly toxic levels of lead from their drinking water focused a national spotlight on the safety of our nation's water supply. In a study conducted in response to the crisis in Flint, the National Resources Defense Council found that lead is pervasive in water systems throughout the country and estimated that more than 18 million Americans may have received water from lead-contaminated pipes in 2015.[163] The U.S. Environmental Protection Agency estimates that as many as 500,000 child care facilities across the U.S. are served by public water systems and are not mandated to test the quality of their drinking water.[164] Furthermore, low-income neighborhoods and communities of color in the U.S. are at greater risk for exposure to lead and other drinking water contaminants.[165]

Lead is highly toxic to nerve cells, and there is no safe level of exposure, especially for young children who absorb lead more easily than older children and adults.[166] Even at very low levels once considered safe, lead can cause serious, irreversible damage to the developing brains and nervous systems of babies and young children.[167] Lead exposure can cause behavioral problems and decrease a child's cognitive capacity and ability to concentrate—all of which affect a child's ability to learn in school.[168]

While lead-based paint in housing is the most common source of lead exposure in young children, according to the AAP, water is "an important but often overlooked source of exposure for children, especially for infants who are formula fed."[169] The issue of potentially unsafe water in communities across the U.S. also provides fresh urgency to efforts to ensure that infants are breastfed optimally and for as long as possible.

Poor nutrition—particularly iron deficiency—actually leads to increased absorption of lead and other toxins in a young child's body. Research indicates that diets rich in nutrients like calcium, iron and Vitamin C can help protect children from the effects of lead exposure and mitigate potential damage.[170] This is yet one more reason why good nutrition and food security are critical to the overall well-being of young children.

beverages.[151] Greater action is needed to prevent unhealthy early weight gain and increasing access to safe clean drinking water is one key strategy for reducing sugar-sweetened beverage consumption by America's youngest children.

French fries are the most common "vegetable" eaten by American toddlers.

It is perhaps not surprising that about 10% of children under age 2 in the U.S. are exhibiting signs of overweight or obesity.[152] Unhealthy early weight gain, however, is only part of the problem. The diets of many young children in the U.S. are also failing to provide the vital nutrients that babies and toddlers need for healthy development. A recent study revealed that 1 in 4 children ages 1 to 2 in the U.S. are not meeting the recommended dietary allowance for iron —one of the most important brain-building nutrients.[153] The study also found that 11% of American toddlers are not meeting the recommended dietary allowance for calcium, a key nutrient for growth and bone health. Recent data on other micronutrient deficiencies in young children is scarce but studies suggest that deficiencies in Vitamin D in children may be on the rise.[154,155]

In addition to the fact that many U.S. parents and caregivers are feeding young children an excess of calorie-rich, nutrient-poor foods, they are also introducing these kinds of foods too early in childhood. Analysis reveals that almost 40% of mothers in the U.S. first gave their babies solid foods before their babies were 4 months of age.[156] The data show that mothers who used formula exclusively were most likely (53%) to be early introducers while mothers who breastfed exclusively were the least likely (24%).[157] Younger, less educated mothers were also more likely to introduce solid foods to their babies too soon.[158]

These unhealthy dietary patterns have profound implications for the future well-being of children. It is imperative therefore that parents and caregivers have the knowledge and ability to provide their young children with nutritious diets and healthy eating habits. Studies show that young children eat more nutritious foods when parents understand the important role that nutrition plays in a child's health and development and when parents themselves model good eating habits.[159] While parental knowledge about nutrition and proper infant and young child feeding practices is critical, so is the ability to prepare nutritious meals. Healthy diets in the U.S. are generally more expensive—both in terms of money and time—and thus out of reach for many Americans.[160] The demands of parents' work schedules—which leave little time for meal planning and preparation—coupled with the relatively high cost of fruits, vegetables and other fresh foods have parents opting for inexpensive, often calorie-dense foods that are quick to prepare.

KATHY
MOTHER OF 6 MONTH OLD
KENTUCKY

"My pediatrician recommended when he was 4 months old that it's time to start solids. I didn't feel really comfortable with that yet."

Supporting Vulnerable Families

Nearly half of all infants and toddlers in the U.S. live in low-income households—that is, households that have less than $47,248 in annual income for a family of 4 based on 2013 levels.[171] These 5.3 million young children are at greater risk of health and developmental problems caused by poor nutrition and the high levels of stress that accompany food insecurity and other economic hardships.

Currently, 1 in 5 children under the age of 6 in the U.S. live in food insecure households.[172] Researchers have characterized food insecurity among America's infants and toddlers as an "invisible epidemic."[173] For mothers, food insecurity makes it harder to maintain a healthy diet and weight. Overall, about 1 in 7 pregnant women report that they "often" or "sometimes" could not afford to eat balanced meals in the past 30 days.[174] The proportion is considerably higher among women in poverty (34%), and among black women (26%).[175]

AMANDA
MOTHER
VIA FACEBOOK

"I'm a military wife with 2 very young children. Without WIC, we would be scrounging to just acquire the basics. WIC is a wonderful program that helps so many... We need to keep WIC going!"

1 in 5 children under the age of 6 in the U.S. live in food insecure households.

Recognizing the serious risk that food insecurity and poverty pose to early child health and development, the U.S. Government established the Special Supplemental Nutrition Program for Women, Infants and Children (WIC) over 40 years ago. The program serves pregnant, breastfeeding and postpartum women and infants and children up to age 5 who are found to be at nutritional risk. WIC has an extensive evidence base demonstrating its impact on improving child health, development and diet quality. Today, over 50% of all babies born in the U.S. are served by WIC, and the program reaches more than 8 million people every month.[176, 177] It is important to note that WIC is not meant to provide all of the foods that a family with young children needs. Along with nutrition and breastfeeding counseling and referrals to other health and social services, WIC provides a very limited number of foods — such as whole-grain bread, baby food, infant formula and milk — as well as separate vouchers that can be used only to buy fruits and vegetables which tend to be lacking in the diets of low-income women and young children. In a large national survey of WIC participants, 60% of respondents reported that there was too little quantity of foods provided through the program though there was a high level of satisfaction with the quality of the food. [178]

Many families with young children also rely on SNAP (the Supplemental Nutrition Assistance Program) to meet their food needs. As the nation's largest nutrition assistance program, SNAP plays a critical role in alleviating poverty and food insecurity and in improving dietary intake, weight outcomes and health among the nation's most vulnerable children. In a landmark study published in American Economic Review, researchers found that young children whose families participated in SNAP were healthier as adults than children whose families did not.[179] Remarkably, researchers found that the positive long-term effects of SNAP begin in pregnancy: children born to mothers participating in the SNAP program were not only healthier later in life but were also more likely to graduate from high school. SNAP participation also boosts a mother's own health, enabling her to better care for her children. Studies have also shown that mothers of young children in food insecure households that receive SNAP benefits are less likely to experience depressive symptoms and more likely to be in better health than mothers in food insecure households that are not receiving these benefits.[180, 181]

Black, Hispanic and Native American infants and toddlers are more likely to live in low-income households than their white counterparts, making children of color less likely to get a strong start to life.[182] And people of color are disproportionately affected by food insecurity.[183] The data also show that there are significant racial disparities in breastfeeding. Black women have the lowest rates of breastfeeding in the U.S., followed by Native American women.[184] Both low-income women and women of color in the U.S. face

unique and more frequent barriers to optimal breastfeeding.[185] These include lack of paid leave, cultural perceptions and attitudes related to breastfeeding (particularly in the black community), lack of knowledge and a lack of breastfeeding support within their communities (e.g. lactation counselors, baby-friendly hospitals, etc.).[186, 187] Meanwhile, children of color in the U.S. are disproportionately affected by obesity, which breastfeeding has been shown to protect against, and therefore could stand to benefit the most from optimal breastfeeding.

THE EARLY HEAD START OPPORTUNITY

Created in 1994, Early Head Start helps infants and toddlers from vulnerable families learn and thrive. It is a federally funded program that provides comprehensive child development and family support services such as home visitations, health screenings, doctor referrals and nutritional programs to low-income pregnant women, infants, toddlers and their families.

Because of the comprehensive nature of the program and its emphasis on quality, Early Head Start has been shown to have positive impacts on the cognitive and social–emotional development of young children. Early Head Start also provides an opportunity to improve the nutritional health of pregnant women, babies and toddlers. Nutritional assessments and screenings are an important part of Early Head Start programs as well as other services that promote healthy birth outcomes.

Currently, Early Head Start reaches only 4% of eligible children; many programs have waiting lists and are unable to serve all the families who want to participate. With increased funding to expand the program and maintain its quality and comprehensive approach, Early Head Start can be better leveraged as a resource to improve the nutritional health and developmental potential of some of America's most vulnerable children.

SOURCES: CENTER FOR AMERICAN PROGRESS, U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES, ADMINISTRATION FOR CHILDREN AND FAMILIES, ZERO TO THREE

A Snapshot of the First 1,000 Days in America

It is clear that there is a need to ensure that all young children in the U.S. have the opportunity to live up to their potential and lead healthy lives. At the end of Part 1, we looked at the 10 essential building blocks for a healthy first 1,000 days. When we examine how the U.S. is performing in these critical areas, the statistics paint a troubling picture. By one measure, it seems that as many as 4 out of 5 children are not benefitting from all 10 of the building blocks (see page 19). In the next part of the report, we will explore ways that we can all help nourish our nation's youngest children.

 A healthy and nutritious diet for mothers during pregnancy	Nearly half of women gain an excessive amount of weight during pregnancy.
 Good care for all mothers during pregnancy	The U.S. has one of the highest maternal mortality rates of any wealthy country in the world.
 Exclusive breastfeeding for the first 6 months	Only 22% of infants are exclusively breastfed at 6 months.
 Nurturing, responsive care and feeding of babies and toddlers	Less than half of U.S. mothers receive any paid time off to care for their newborn.
 The right foods introduced to babies at the right times	Almost 40% of parents introduced solid foods to their babies too early.
 A healthy and nutritious diet for babies and toddlers	1 in 4 toddlers are not getting enough iron in their diets—a key nutrient for brain development.
 Water and other healthy beverages with no added sugars for toddlers	More than half of toddlers and preschoolers consume one or more sugar-sweetened beverage every day.[188]
 The right knowledge and skills for parents and caregivers to properly nourish young children	54% of mothers say they receive mixed messages about what to feed their young children.[189]
 Consistent access to enough nutritious food for families of young children	1 in 5 children under the age of 6 live in families that struggle to put enough nutritious food on the table.
 Societal investments in the well-being of every baby and toddler	More than 25% of infants and toddlers live in poverty.

PART 3

An Agenda for the Next 1,000 Days

The quality of a child's nutrition is shaped not only by decisions made by his parents and caregivers but also by broader social and economic factors. Everyone has an important role to play in nourishing our nation's youngest children: from hospitals and healthcare providers to early childhood educators and childcare providers, from advocates and community organizations to the business community and policymakers at the federal, state and local levels.

Here, we identify a set of "wins"—areas where greater action and investment can have a transformative impact on the first 1,000 days and the future health and well-being of all infants and toddlers in America. These 10 Wins for the Next 1,000 Days form an ambitious yet achievable agenda for change. This list is not intended to be exhaustive but instead prioritizes key areas for action. In laying out these "wins", we aim to spark a much-needed national conversation about how best to improve the nutritional health of our youngest children and their families. As we will see, there is already significant momentum and a strong foundation upon which to build a movement to ensure that every child in America has a healthy first 1,000 days.

10 WINS FOR THE NEXT 1,000 DAYS

1. Empower parents and caregivers with an understanding of the importance of early nutrition and knowledge of best practices for infant and young child feeding.
2. Educate and train medical and health care professionals, child care workers and others working with expectant mothers, babies and toddlers on the importance of early nutrition and optimal infant and young child feeding practices.
3. Establish evidence-based dietary guidelines for pregnant women and children under age 2.
4. Invest in the research, monitoring and surveillance of the nutritional status of pregnant women and children under age 2.
5. Support healthy pregnancies by ensuring access to high quality preconception and prenatal care, nutrition education and obesity prevention programs.
6. Improve support for mothers to breastfeed by creating breastfeeding-friendly communities, workplaces and healthcare facilities.
7. Invest in paid parental leave and family-friendly workplace policies to support parents to give their children the strongest start to life.
8. Encourage companies to follow the World Health Organization's International Code of Marketing of Breast Milk Substitutes which provides guidelines for the ethical marketing and promotion of infant formulas and foods and beverages for young children.
9. Strengthen programs that reach low-income babies, toddlers and their families.
10. Ensure that healthy, nutritious foods are the affordable, available and desired choice for all families.

1

Empower parents and caregivers with an understanding of the importance of early nutrition and knowledge of best practices for infant and young child feeding.

Parents and caregivers are the most influential actors in shaping a child's development. Along with the right support and encouragement, parents need the right information at the right time in order to make the best decisions about feeding their children. As parents increasingly turn to the internet and to other parents via social media and online forums for nutritional and feeding advice, there is a significant opportunity to provide consistent, evidence-based information through the online sources they trust and rely on.

Home visiting programs also offer a unique opportunity to help build parents' nutrition knowledge and skills. These programs provide parents of infants and young children with one-on-one support in their own homes through periodic visits conducted by nurses, social workers or other trained providers. Research shows that home visiting programs, when implemented well, are highly effective in improving child health and development outcomes and building strong parenting skills. There is evidence that shows that pregnant women who participate in home visiting programs have better birth outcomes and the programs have been found to have a positive impact on breastfeeding.[190,191] The Maternal, Infant, and Early Childhood Home Visiting Program (MIECHV) is a federal and state funding partnership that supports home visiting services that target high risk families of young children. Continued bipartisan support for MIECHV is essential to empowering the families of vulnerable infants and toddlers with the skills and knowledge they need to nurture their children.

2

Educate and train medical and healthcare professionals, child care workers and others working with expectant mothers, babies and toddlers on the importance of early nutrition and optimal infant and young child feeding practices.

Those who work with mothers, infants and toddlers are in a position to empower parents and caregivers with the knowledge and skills they need to nourish young children. It is essential that these professionals understand the importance of good nutrition in the first 1,000 days and can help share best practices with parents around infant and young child feeding.

More investments in training and educational programs for physicians and healthcare professionals are needed in this area. For example, while lack of physician knowledge about breastfeeding is associated with decreased rates among patients, training of physicians has been shown to be effective in increasing breastfeeding rates.[192] To this end, the Academy of Breastfeeding Medicine recommends that breastfeeding education be incorporated into medical school curricula and clinical training. Recognizing the need for more physician education on the importance of breastfeeding for the health of both mom and baby, the ACOG developed a toolkit that puts essential information and resources in the hands of physicians so they can be better prepared to support the transition from pregnancy to breastfeeding.[193] Another opportunity for physicians to help provide parents and caregivers with guidance around good infant and toddler feeding practices is during routine health check-ups. In their first 2 years, children typically have about 10 "well-child" visits with their pediatrician or family physician. These visits are opportunities for physicians to discuss diet and eating habits with parents as well as to identify if a family is nutritionally at risk. In 2015, AAP recommended for the first time that pediatricians screen all children for food insecurity, acknowledging the adverse health impacts of food insecurity in its policy statement, "Promoting Food Security for all Children." The policy statement also recommends that all pediatricians become familiar with and refer families to community

TANYA
MOTHER OF 9 MONTH OLD
MISSISSIPPI

"I love him, so I have to make sure he likes what he eats."

resources for nutrition assistance as needed.

Childcare providers offer another important entry point for improving young child nutrition. Thanks to the Child and Adult Care Food Program (CACFP), over 4 million children receive nutritious meals in their child care centers and licensed family based caregiving settings. Recently, the United States Department of Agriculture (USDA) issued new healthier nutrition standards for meals and snacks served through CACFP. CACFP also offers child care providers with ongoing training, technical assistance and on-site support and gives them educational opportunities to learn more about the importance of good nutrition for young children. By offering meals consistent with the new nutrition standards, child care providers can help lead the charge for healthier infant and toddler diets.

3

Establish evidence-based dietary guidelines for pregnant women and children under age 2.

Currently, the U.S. has no national dietary guidelines for children under 2 or for pregnant women. USDA and the Department of Health and Human Services have begun the development of the first-ever set of dietary guidelines for this population which will be released with the new set of dietary guidelines for all Americans in 2020. These guidelines will take into account the unique nutritional needs, eating patterns and developmental stages of infants and toddlers from birth to 2 years of age as well as the nutritional needs of pregnant women. The guidelines will likely serve as an important reference point for physicians, nutrition counselors in WIC clinics and early childcare providers as well as a source of information for parents. They will also inform federal nutrition such as WIC and CACFP. Accordingly, it is hoped that the guidelines will be developed in a scientifically rigorous manner and in a way that showcases the vital importance of good nutrition in pregnancy and early childhood.

It will be important that the dietary guidelines address the issue of added sugars in the diets of infants and toddlers. Recently, the American Heart Association (AHA) issued a scientific statement recommending that children younger than 2 years of age consume no foods or drinks with added sugars.[194] The statement was issued in response to mounting evidence that added sugars contribute to a diet that is calorie-rich but nutrient-poor and increase the risk of developing obesity, cardiovascular disease, hypertension and obesity-related cancers. AHA noted that that the consumption of sugar-sweetened beverages in particular has been strongly linked to excess weight gain and an increased risk of obesity in children. It highlighted the critical need for research on the early introduction of added sugars, particularly in infant formulas.

4

Invest in the research, monitoring and surveillance of the nutritional status of pregnant women and children under age 2.

In order to develop policies and programs that measurably improve early nutrition, more data on the eating habits and nutritional status of pregnant women and young children is needed. Currently, little, if any, population-wide data exist on micronutrient deficiencies in young children and pregnant women, including no current national-level data on iron status and anemia prevalence among pregnant women in the U.S. Moreover, the National Health and Nutrition Examination Survey (NHANES)—the leading program of studies assessing the health and nutritional status of adults and children in the U.S.—no longer over-samples pregnant women, making it impossible to develop

nationally-representative conclusions about their health and nutrition or even to examine how different sub-groups of Americans are faring (i.e. by race/ethnicity, income levels etc.). NHANES research also excludes blood sampling for biomarkers (such as those for iron deficiency and inflammation) in children under 1 year, though these markers are recorded for all other age groups. As a result of the lack of biological data in children under the age of 1, it is difficult to estimate the prevalence of iron deficiency in infants in U.S. at the national level.

Greater investments in research as well as periodic national-level nutrition monitoring and surveillance are needed in order to better identify areas where the nutritional health of America's mothers, infants and toddlers may be at risk.

BROADENING THE PERSPECTIVE: LESSONS FROM THE GLOBAL FIGHT AGAINST MALNUTRITION

Malnutrition is one of the world's most pressing challenges. And though today fewer people go hungry than did a century ago, having more calories does not mean having more nourishment. Currently, there are over 2 billion people throughout the world that lack the essential vitamins and nutrients they need to live healthy lives. This chronic lack of essential vitamins and nutrients is known as micronutrient deficiency and is primarily a result of low quality diets.

Within the last decade, there has been a surge in innovative partnerships and research focused on tackling micronutrient deficiencies—a problem also found within our own borders in the U.S. Globally, public-private partnerships between governments, universities and research institutions, philanthropies and the private sector have been instrumental in bringing proven solutions to scale. One area in which public-private partnerships have had a major impact is in food fortification—a process which involves adding small amounts of vitamins and minerals to commonly used foods and condiments such as flour and salt. When fortified, widely used ingredients and foods can be vehicles to deliver key nutrients to a large majority of the population. The Dutch multinational company DSM has been a key player in many international food fortification initiatives. Leveraging its tremendous research and decades-long experience in vitamin and mineral fortification, DSM has partnered with organizations and communities throughout the world to increase the nutritional value of food through fortification.

Most of the global partnerships focused on tackling malnutrition, including those focused on micronutrient deficiency, have a strong emphasis on the critical 1,000 day window. The world's future mothers—including adolescent girls—and young children are especially vulnerable to micronutrient deficiency, and it is clear that poor nutrition among these groups has a devastating, long-term impact on the health of the entire population. Many countries have recognized the value of investing in the first 1,000 days, and as a result, there are several large-scale initiatives throughout Africa, Asia and Latin America focused on improving women's nutritional status as well as increasing access to high quality prenatal care and providing new mothers with breastfeeding counseling and support. The Alive & Thrive initiative, which is supported by the Bill & Melinda Gates Foundation and several other partners, has demonstrated that innovative approaches to improving infant and young child feeding practices can be delivered with impact and at scale in Bangladesh, Ethiopia and Vietnam.

While U.S. leadership and expertise has been invaluable in the global fight against malnutrition, lessons from other countries' experiences can also be applied to our own efforts to improve the nutritional health and well-being of America's youngest children and their families.

5

Support healthy pregnancies by ensuring access to high quality preconception and prenatal care, nutrition education and obesity prevention programs.

Millions more American women have access to health insurance, including coverage of preconception and prenatal care, as a result of the Affordable Care Act (ACA). But there are still gaps in access to health insurance in some states. Medicaid, a source of comprehensive health insurance for millions of pregnant women and low-income families, is poised to fill in these gaps. Thirty-two states plus Washington, D.C. have expanded their Medicaid programs to cover American adults at or below 138% of the federal poverty line[195] (the 2016 federal poverty line is $24,300 for a family of 4).[196] The remaining 18 states can dramatically increase the number of women with access to critical health services by expanding their Medicaid programs.

Health insurers can play a pivotal role in supporting healthy pregnancies. New health insurance plans are required to cover a wide range of services including preconception and prenatal care, certain preventive screenings and ensure direct access to obstetrician-gynecologists. Continued expansion of health insurance, including Medicaid, will put affordable preconception and prenatal care within reach for millions more women who are uninsured today.

There is also an opportunity to expand health coverage so that that all women in public and private insurance have access to weight management services before and during pregnancy. In addition, Medicaid and private payers should be required to cover diabetes and other risk factor-oriented counseling for pregnant women.

Beyond insurance coverage, providers also need the right tools and appropriate training to address weight management during pregnancy. In response to emerging evidence on the impact of excessive weight gain during pregnancy on the health of both mother and baby as well as the increasing prevalence of obesity among American women, in 2009, the Institute of Medicine (IOM) published revised pregnancy weight gain guidelines. While welcomed by many in the medical community, the updated IOM recommendations have been met with criticism from some physicians who believe that the weight gain targets are too high, especially for overweight and obese women. There is a need then for clear and consistent guidance on how best to help women gain a healthy amount of weight during pregnancy.

6

Improve support for mothers to breastfeed by creating breastfeeding-friendly communities, workplaces and healthcare facilities.

Improving rates of breastfeeding in the U.S. will require action on the part of many stakeholders, including communities, employers, hospitals, healthcare systems and health providers. In 2011 the U.S. Surgeon General issued a Call to Action to Support Breastfeeding that laid out clear action steps to support mothers and make breastfeeding easier. As part of its Healthy People 2020 strategy, the CDC also set goals for breastfeeding, including increasing the proportion of babies who are exclusively breastfed from 18.8% to 25.5%.

While breastfeeding rates have begun to improve in the past few years, more needs to be done to meet these breastfeeding targets by 2020. For example, improvements are needed in maternity care practices to ensure mothers can access skilled breastfeeding support from healthcare professionals. In 2010, The Joint Com-

mission—a major organization that accredits and certifies U.S. hospitals—added exclusive breastmilk feeding during the newborn's entire hospitalization as a new quality of care measure and is now requiring that hospitals with at least 300 births per year report on this measure. It is hoped that this measure will reduce the common practice among hospitals of giving healthy breastfed infants formula and other liquids when there is no medical need or parent desire for it.

With the advent of the ACA, strides have been made to build better support for breastfeeding in the workplace. The ACA requires that mid-to-large employers provide reasonable break time and a private non-bathroom space for nursing mothers to pump their breastmilk for up to a year after the child's birth.[197] In addition, health insurance companies must also provide coverage for breast-pumps and lactation services, which is essential to allow working mothers to continue to breastfeed.[198]

SHIRELLE
MOTHER
VIA FACEBOOK

"During a routine appointment while 22 weeks pregnant, my doctor discovered that I had begun dilating and sent me straight to the hospital. I was immediately placed on 100% bedrest and advised, at 22 weeks, that I would remain in the hospital up until I delivered. I gave birth to a 1 lb 15 oz baby boy at only 25 weeks gestation, and he remained in the NICU for almost 3 months after his birth. I am a government employee, and we do not get maternity leave – you are required to use your sick leave. By the time my son was released from the hospital, I had exhausted all of my sick leave. Thankfully, many of my co-workers donated leave to me, and I had a very supportive boss who allowed me to telework. I don't know what I would have done without those options."

7

Invest in paid parental leave and family-friendly workplace policies to support parents to give children the strongest start to life.

In the absence of a federal law covering all Americans, many states have taken the lead on implementing family-friendly paid leave policies. Currently, California, New York, New Jersey and Rhode Island mandate paid family leave for new parents.[199] Five states and the District of Columbia require employers to allow workers to earn paid sick days that can be used to care for a spouse or partner recovering from childbirth and to attend prenatal and postnatal medical appointments.[200] Additionally, 16 states and the District of Columbia guarantee some pregnant women reasonable accommodations on the job. These and other states can serve as models for how to implement policies that support parents.

The U.S. Department of Defense (DOD) has also stepped up on the issue of paid leave. In early 2016, the DOD announced that it was increasing military maternity leave and instituting other family-friendly benefits in an effort to support military families, improve retention and strengthen America's armed forces. Women across the joint force can now take 12 weeks of fully paid maternity leave—double the benefit that was offered as of early 2015. According to Secretary of Defense Ash Carter, the policy puts the DOD in "the top tier of institutions nationwide".

Many companies have also been taking the lead on offering their employees paid parental leave. In particular, tech companies such as Google, Facebook, Spotify and Netflix have been updating their policies to offer their employees, who tend to be highly skilled and highly educated, generous maternity and paternity leave.

8

Encourage companies to follow the World Health Organization's International Code of Marketing of Breast Milk Substitutes, which provides guidelines for the ethical marketing and promotion of infant formulas and foods and beverages for young children.

The negative association between the marketing of infant formulas and breastfeeding rates was the basis of the World Health Organization's International Code of Marketing of Breastmilk Substitutes (the Code). Developed together with manufacturers of infant formula, the Code provides guidelines for the marketing and distribution of formula and limits direct marketing to pregnant women and new mothers. It is important to note that infant formula marketing in the U.S. is a relatively recent phenomena—until the late 1980s, infant formula was not marketed directly to American consumers.

There are a number of provisions in the Code, but the one that has attracted greatest attention in the U.S. is the ban on free infant formula samples to mothers, particularly in hospitals and other healthcare settings. A 2012 report from the IOM on Early Childhood Obesity Prevention Policies called for action from hospitals and healthcare facilities in enforcing the Code.[201]

In 2015, with support from breastfeeding advocates and state health officials, all hospitals in Maryland voluntarily decided to stop the practice of hospitals handing out company-sponsored gift bags of infant formula to new mothers. Maryland became the fourth state after Massachusetts, Rhode Island and Delaware to stop the harmful practice and move closer to greater compliance with the Code. Although only 4 states have stopped providing free infant formula to new mothers altogether, there has been a significant decline in this practice across the U.S., which is a promising sign that hospitals all over the country are increasing their commitment to supporting breastfeeding.

9

Strengthen programs that reach low-income babies, toddlers and their families.

Federal and state programs targeted at low-income families are essential to ensuring the nutritional health of millions of young children in America. These programs range in size and scope but there is a significant opportunity to strengthen and expand these public programs to ensure that all eligible families receive services and that the services offered provide the necessary support for a healthy first 1,000 days.

As noted in Part 2 of this report, WIC is a vital program that has a proven impact on the long-term health and development of young children. However, more can be done to build on the success of WIC in order to ensure that the program serves the needs of families with young children who are eligible to participate. While WIC reaches more than 8 million women and children annually, the program is only reaching 3 out of 5 eligible families. In the latest year for which USDA has published data on participation rates, WIC reached only 68% of eligible pregnant women, 78% of eligible postpartum women, 84% of eligible infants and only 50% of eligible children ages 1-4. There is significant state variation in enrollment rates as well, with some states, such as California and Minnesota, enrolling over 70% of eligible participants while New Hampshire has the lowest percentage of eligible families enrolled in WIC.

Outreach to eligible families of young children is critical to getting them enrolled and accessing the WIC benefit package. This is especially true for families of older toddlers and children because there is a dramatic drop off in

AUTUMN
MOTHER
VIA FACEBOOK

"WIC has been one of the BIGGEST financial blessings to my family. I have three little ones, and it has been a lifesaver for us. Even when people are working, it is hard to afford things still, due to receiving a small income from your job. I've known many working families who still need WIC to get by. It's not a hand out, it's HELP!"

enrollment rates around age 1. States and stakeholders should adopt best practices, including using culturally and linguistically competent strategies, as well as innovative tools and technologies to reach younger families.

Changes are also needed to encourage full utilization of the benefit by enrolled families. Some families face challenges in using their benefit; these include limited access to well-stocked WIC-approved grocery stores, confusion about what products are WIC eligible and arbitrary limits on redemption rules to name a few. Each state has the power and the flexibility to address these challenges—and has the ability to implement simplifications that will encourage full utilization of the benefit.

To better serve the nutritional needs of young children whose families participate in SNAP, there is an opportunity to strengthen the program by increasing the amount of money provided in the monthly benefits. A 2013 IOM study found that the benefit level is not adequate for most families, making it impossible for them to purchase healthy foods throughout the entire month.[202] Studies show that increasing SNAP benefits can actually drive improvements in food security and health. For example, two years after the temporary increase in SNAP benefit levels in 2009, young children in households receiving SNAP benefits were significantly more likely to be "well" than children from non-participating, low-income households; this difference was only observed after the benefit boost.[203]

Finally, as discussed in Part 2 of this report, Early Head Start offers a small but powerful platform to reach low-income infants and toddlers with quality nutritional care. Expanding Early Head Start to reach beyond the 156,000 children it currently serves could give the 3 million children who are eligible for Early Head Start more opportunity to thrive.[204]

10

Ensure that healthy, nutritious foods are the affordable, available and desired choice for all families.

Healthier diets are an essential component to ensuring that children in the U.S. have the best start to life. Nutritious foods must be made more available and affordable to all families. This could be done through policies or practices that make nutritious foods like fruits and vegetables more affordable for everyone. Ensuring that parents and caregivers of young children are better able to provide for the nutritional needs of young children is also vital. Parents and caregivers need adequate jobs that offer health and other benefits and decent wages. And when work is not available or pay is too low, income supports such as Unemployment Insurance and the Temporary Assistance for Needy Families program (TANF) become critical. In addition, policies like the Earned Income Tax Credit and Child Tax Credit can put more money in the hands of low-income families, enabling them to buy healthier food options. In fact, a growing body of evidence shows that boosting the incomes of poor families can deliver important health and developmental benefits for young children. One recent study demonstrates that infants born into families benefiting from the Earned Income Tax Credit actually were less likely to be born low birth weight—an important marker for future health and development as we saw in Part 1.[205] While the Child Tax Credit is available to many low-income working families, it doesn't reach—but should—those with the lowest earnings.

In addition to increasing access to nutritious foods, more needs to be done to ensure that water—along with breast milk or unsweetened milk—is the beverage of choice for toddlers. Issues of water access and safety should be an integral part of the conversation around good nutrition in the first 1,000 days. Our nation's young children and their families need reliable access to safe drinking water and communities and daycare sites should regularly test their water supplies to ensure they are providing children with clean water. In response to the water crisis in Flint, Michigan, the American Medical Association (AMA) recently adopted a policy measure designed to protect the public from further exposure to lead in drinking water. They have called for measures requiring all schools and registered daycare sites to be routinely tested through municipal water quality assurance efforts. As noted in Part 2, the current laws do not apply to many schools and daycare sites in the U.S., and water testing is voluntary. In addition, the AMA is advocating for more testing, health screenings and nutritional support for children and other people exposed to lead contaminated water.

Investing in babies and toddlers for a brighter future

It is clear from the evidence that investments in early childhood have enormous payoffs down the road.[206] Focusing efforts on the 1,000 day window of opportunity can help build a strong foundation for a child to grow, learn and thrive. Yet investment

in improving the health and school readiness of America's infants and toddlers is miniscule. A recent analysis shows that public spending on infants and toddlers on a per capita basis is currently less than 10% of the funding spent on K-12.[207] Increasing support for high-quality childcare, WIC, Early Head Start, home visiting services and other programs that target the first 1,000 days can put children on a path to health and success. In addition to more investment, greater coordination is needed in the public programs and initiatives that specifically target infants and toddlers.

CONCLUSION

A Final Thought on the Next 1,000 Days

Today's babies and toddlers offer a glimpse of what our nation's future holds. They are the American workforce of tomorrow—one that will need to be healthy and highly-skilled in order to compete in the global economy, keep our country safe and teach the next generation of children.

All of us have a stake in whether children get a strong start to life. As a society, when we don't nourish a child's potential in the first 1,000 days, we all feel the consequences. Many of the issues with which policymakers struggle—from educational achievement gaps, to higher healthcare costs, to deepening disparities—have their roots in how well a child fares during the first years of life. As the science and the data presented here show, action to improve nutrition during the first 1,000 days is critical to ensuring healthier and more prosperous futures—for our children and for us all.

"It is easier to build strong children than to repair broken men."

FREDERICK DOUGLASS

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