THE NATIONAL BUREAU *of* ASIAN RESEARCH
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Nutrition Spectrum Backgrounder: Select Interventions & Country Snapshots

The "Nutrition Spectrum Backgrounder" contains four compelling case studies on the dual nutrition dilemma, covering issues related to both undernutrition and overnutrition. The objectives for this document are twofold: (1.) to provide a broad descriptive landscape of what the nutrition transition means for developing societies with China, India, Vietnam, and South Africa as illustrative case studies, and (2.) to serve as an information and educational tool for those who are new to the field of nutrition.

This document was compiled by:

Mr. Khanh Nguyen
knguyen@nbr.org

The National Bureau of Asian Rsearch
1215 Fourth Avenue, Suite 1600
Seattle, WA 98105

Abstract

China, India, Vietnam, and South Africa together represent approximately one-quarter of the world's population, and the challenges each country faces represents many aspects of the global nutrition challenge—the theme for the 2008 Pacific Health Summit. At one time, these nations faced the challenges presented by undernutrition; and as a result of economic growth, urbanization, and other factors over the last three decades, they now receive significant attention from the global nutrition community for their experiences with the dual nutrition dilemma. This requires them to tackle the complex problems of both undernutrition *and* overnutrition. Today, undernourishment still remains a problem in rural areas of China, while the obesity rate increased by 97% between 1992 and 2004—from 1.8 million people to 60 million people.[1] India has more undernourished people (350 million) than any other country in the world,[2] but it also leads the world with the highest number of diabetics (40.9 million).[3] Vietnam and South Africa face similar situations. These countries offer compelling case studies of the dual nutrition dilemma, and the available data on their populations and experiences offer useful evidence and information for addressing The Global Nutrition Challenge.

[1] "China Health and Nutrition Survey," China Centers for Disease Control, University of Carolina–Carolina Population Center, and U.S. National Institutes of Health, 2006.

[2] Devi Shridhar, *The Battle Against Hunger: Choice, Circumstance, and the World Bank* (Unpublished book, 2008).

[3] R. Deepa, V. Mohan, S. Sandeep et al., "Epidemiology of Type 2 Diabetes: Indian Scenario," *Indian Journal of Medical Research* 125 (March 2007): 217–230.

I.
China, India, Vietnam, and South Africa: Country Snapshots

Overview

Undernutrition is a problem that plagues the entire globe. Not only does it lead to increased vulnerability to infectious diseases due to weakened immune systems, but severe undernutrition can also hinder long-term physical and mental development, which in turn impacts economic development.

The *Lancet's Series on Maternal and Child Undernutrition*, launched in January 2008, has provided new insight into the magnitude and impact of poor nutrition on women and children. According to the series, more 3.5 million mothers and children die each year in part because of poor nutrition resulting from inadequate dietary intake and infectious diseases.[4] Those who do survive become ensnared in a cycle of undernutrition. For example, stunted children often suffer irreversible physical and cognitive damage whose effects impact subsequent generations. When stunted women have children of their own, those babies are more likely to be undernourished.[5] It is for this reason the latest nutrition research and nutrition interventions have centered around maternal and child health. It is important to note that undernutrition is not only caused by poor diets, but also by infectious diseases, such as rotavirus and diarrhea.

On the opposite end of the nutrition spectrum, overweight and obesity are viewed as increasingly serious public health problems in both developed and developing societies. Though both of these conditions and their associated diseases, such as diabetes and cardiovascular disease, are traditionally considered Western problems, overweight and obesity are becoming more and more prevalent in Asia. For example, China, India, and Vietnam have reported increases in obese and overweight populations. Even in Africa, countries such as South Africa are facing an emerging overweight and obesity problem. Unprecedented economic growth and urbanization in all these countries are part of the reason for the nutrition transition, which is characterized by a shift from traditional plant-based diets to diets containing more vegetable oils, sugars, and animal proteins and fats. This problem is further compounded by a decrease in physical activity and an increase in sedentary lifestyles.

As understanding of the global nutrition challenge continues to grow, the link between both sides of the nutrition spectrum become increasingly apparent. For example, fetal malnutrition, and child undernutrition, and stunting increases the probability of becoming obese and suffering from diabetes, hypertension, cardiovascular diseases, and associated diseases in adolescence and adulthood.

The Nutrition Continuum: Country Snapshots

China

Since the establishment of the UN Millennium Development Goals (MDGs) in 1990, China has been lauded as a global leader in the fight against undernutrition. Just 15 years later, China was on track to surpass Goal 1, Target 2 of the MDGs, which aims to reduce by half the proportion of people suffering from hunger by the year 2015. Data from 1990–92 revealed that the proportion of the population below the minimum level of dietary energy consumption

[4] "Series on Maternal and Child Undernutrition," *Lancet* 371, no. 9609 (January–February 2008): 340–58.

[5] Ibid.

was 17 percent.[6] By 2005, the proportion had been reduced to 10 percent.[7]

China has also had success reducing child underweight and stunting. In 1992, 32 percent of children from ages 0–3 years were underweight and 17 percent were stunted.[8] Between 2000 and 2006, underweight and stunting among children from ages 0–5 years had fallen to 15 percent and 11 percent, respectively.[9] China's success in this area can be attributed to many factors, among them government leadership in addressing poverty and malnutrition, economic growth, and increased access to quality education and primary healthcare in rural areas.[10]

Problems of overweight and obesity in urban areas of China have also made headlines. In 2005 the prevalence of overweight adults in China was 16 percent,[11] and despite a seemingly low overall prevalence of obesity among adults over the age of fifteen (nearly 5 percent[12]) obesity rates in urban areas such as Beijing and Shanghai have been reported to be as high as 20 percent.[13] In 2004, upwards of 200 million people in China were found to be overweight.[14]

China has the second highest number of diabetics in the world, with approximately 40 million people suffering from the disease.[15] The aging of China's population only threatens to exacerbate the diabetes problem. According to the China National Committee on Aging, in 2006 there were 149 million people age 60 or over in China.[16] This population is expected to grow to 248 million by 2020.[17] With a significant percentage of China's population becoming older and being diabetic, the country is facing increasing strain on its health system, along with the concomitant significant economic impact caused by this shift.

The health prospects for China's future generations in the face of rising obesity rates are worrisome. According to China's Ministry of Education 8 percent of children from ages ten to twelve years are now either overweight or obese, and what is most worrisome is that the rate of China's childhood obesity has doubled in just one decade.[18]

With a culture and history informed by rich agricultural traditions as well as by an adherence to Traditional Chinese Medicine (TCM), which aims to prevent diseases before they occur, a popular perception is that the Chinese people are among the fittest in the world. Yet nearly one in five Chinese

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6 See FAO Statistics Division and Analysis Service (China), http://www.fao.org/es/ESS/mdg_kit/pdf/china_e.pdf, (Monitoring Progress Towards Hunger Reduction Goals of the World Food Summit and Millennium Declaration).

7 See UNICEF Information by Country Database, http://www.unicef.org/infobycountry/index.html.

8 Peter Svedberg, "2020 Focus Brief on the World's Poor and Hungry People: Child Malnutrition in India and China," *International Food Policy Research Institute*, 2007.

9 See UNICEF Information by Country Database, http://www.unicef.org/infobycountry/index.html.

10 Scott Bobb, "UN Falling Behind in Child Nutrition Goal," *Voice of America*, May 2, 2006, http://www.voanews.com/english/archive/2006–05/2006–05–02–voa12.cfm.

11 James Randerson, "China's Alarming Increase in Obesity Blamed on More Affluent Lifestyle," *Guardian*, August 18, 2006, http://www.guardian.co.uk/world/2006/aug/18/china.mainsection.

12 See WHO Global Strategy on Diet, Physical Activity, and Health, http://www.who.int/dietphysicalactivity/publications/facts/obesity/en/ (Overweight and Obesity Worldwide).

13 Ibid.

14 "China Health and Nutrition Survey," China Centers for Disease Control, University of Carolina–Carolina Population Center, and U.S. National Institutes of Health, 2006.

15 Richard Donnelly, Binhui Wang, and Qu Xianqin, "Type 2 Diabetes in China: Partnerships in Education and Research to Evaluate New Anti-diabetic Treatments," *British Journal of Clinical Pharmacology* 61, no. 6 (June 2006): 702–5.

16 Samuel Durso, Xing-Ping Tian, Sean Lunh, et al., "The Aging Population and Development of Geriatrics in China," *Journal of the American Geriatrics Society* 56, no. 3 (March 2008): 571–573.

17 Ibid.

18 "China Health and Nutrition Survey," China Centers for Disease Control, University of Carolina–Carolina Population Center, and U.S. National Institutes of Health, 2006.

are now either overweight or obese.[19] The standard explanations, which point to economic growth and urbanization leading to dietary shifts and a decrease in physical activity, are without a doubt important. However, the overweight and obesity problem in China is also the result of long-embedded cultural beliefs and social attitudes. For centuries, Chinese culture has viewed a person's weight as one measure of his or her wealth, with excess body weight representing prosperity and good health.[20] Though these long-held perceptions may be inaccurate, such misconceptions—exacerbated by recent memories of widespread famine—about the association between excess body fat and health may have led many to overlook or disbelieve the threats posed by overweight and obesity.

India

India is home to the world's largest number of undernourished people, with 212 million in 2002.[21] As of 2006, India had only achieved less than half of Goal 1, Target 2 of the UN MDGs. That same year, the National Family Health Survey (NFHS) found that only 57 percent of men and 52 percent of women were at a healthy weight for their height.[22]

Furthermore, child undernutrition rates in India are among the highest in the world. In the period 2000–06, 43 percent of children under the age of five in India were underweight; 20 percent of children in the same age group were wasted; and 48 percent were stunted.[23] Though children in rural areas are more likely to be underweight, even in urban areas two out of five children suffer from chronic undernutrition. The states of Madhya Pradesh, Jharkand, and Bihar are home to more than 50 percent of India's underweight children under the age of five.[24]

As India's economy grows, the government faces the paradox of having to combat extremely high rates of undernutrition, particularly among children, while also addressing growing overweight and obesity issues in both affluent urban areas as well as urban slums. Because undernourished and stunted children are at increased risk of obesity and related diseases in adulthood, India's struggle to control both ends of the nutrition spectrum will likely become even more pronounced in the future as today's undernourished and stunted children age. According to the NFHS, 10 percent of India's population was either overweight or obese in 2006.[25] The 2006 NFHS also concluded that being overweight or obesity is most common among those in the highest wealth quintile.[26] This is in stark contrast to developed countries like the United States where the prevalence of overweight and obesity is highest in the lowest wealth quintile.

Of particular concern for the future of India is the prevalence of overweight and obese women and children. In 2006 the NFHS also reported that approximately 24 percent of urban women were overweight or obese.[27] A separate study on schoolchildren from ages ten to sixteen years found that nearly 20 percent were either overweight or obese.[28] In Asian societies, medical complications of obesity, such as diabetes, are found at lower levels of overweight as compared to the United States, further

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19 Yangfeng Wu, "Overweight and Obesity in China," *British Medical Journal* 333, no. 7564 (August 2006): 362–363.

20 Ibid.

21 Devi Shridhar, *The Battle Against Hunger: Choice, Circumstance, and the World Bank* (Unpublished book, 2008).

22 "National Family Health Survey (NFHS), India: Key Findings 2005–2006," International Institute for Population Sciences (IIPS) and Macro International, 2007.

23 See UNICEF Information by Country Database, http://www.unicef.org/infobycountry/index.html.

24 "National Family Health Survey (NFHS), India: Key Findings 2005–2006," International Institute for Population Sciences (IIPS) and Macro International, 2007.

25 Ibid.

26 Ibid.

27 Ibid.

28 Somini Sengupta, "India Prosperity Creates Paradox; Many Children Are Fat, Even More Are Famined," *New York Times*, December 31, 2006, http://www.nytimes.com/2006/12/31/world/asia/31india.html?scp=1&sq=obesitypercent2C+india&st=nyt.

elevating concern about the long-term health costs that may result from these nutritional problems.

India has the highest number of diabetics in the world. Currently, there are approximately 40.9 million people suffering from diabetes in the country, and with economic growth, the problem is likely to continue.[29] Moreover, as with China, the aging of India's population is likely to exacerbate the strain that diabetes, hypertension, cardiovascular disease and obesity put on the struggling public health system. In 2001 there were approximately 77 million people age 60 and over.[30] By 2013, this number is expected to grow to 100 million.[31]

Vietnam

Since the establishment of "Doi Moi"—a national economic renewal policy—in 1979, Vietnam has made great strides in addressing and reducing undernutrition. In 1991 the proportion of the population below the minimum level of dietary energy consumption was 31 percent.[32] By 2002, the prevalence of undernourishment was 17 percent.[33] Between 1980 and 2007, Vietnam reduced the prevalence of underweight among children under the age of five from 52 percent to 21 percent.[34] Vietnam is now on track to achieving Goal 1, Target 2 of the UN MDGs by the year 2015.

Like China and India, Vietnam is now undergoing a nutrition transition. In large part as a result of urbanization, diets are beginning to shift from traditional dishes composed of rice and fish to more processed foods high in fat and sugar. Additionally, lifestyles are beginning to change as physical exercise, such as walking or biking has given way to the widespread use of motor vehicles, such as cars and scooters. Both factors contribute to the growing health problem of overnutrition in Vietnam, resulting in increased numbers of people who are overweight and obese.

Vietnam also has one the fastest growing rates of diabetes in the world. From 1990 to 2007, the prevalence of diabetes increased from 0.9 percent to 4.4 percent.[35]

Vietnam founded an Obesity-Malnutrition Institute in 2007 under the auspices of its National Institute of Nutrition in order to deal with the dual nutrition dilemma. The country's investment in the Institute and its research reflects its rapidly changing nutrition environment, as well as the country's strong political will to address and countercheck the negative effects of the transition. Though the prevalence of overweight and obesity in Vietnam does not match that of China and India's, it is not very far behind. A study based on data from national surveys showed that the rate of overweight among adults more than doubled (from 2 percent to 5.7 percent) between 1992 and 2002.[36]

South Africa

In South Africa, nutritional extremes are prevalent. Before the end of apartheid, hunger was not uncommon, and the country was a recipient of food aid. Many people in rural areas continue to suffer from undernutrition to this day. As recently

[29] R. Deepa, V. Mohan, S. Sandeep et al., "Epidemiology of Type 2 Diabetes: Indian Scenario," *Indian Journal of Medical Research* 125 (March 2007): 217–230.

[30] Naseem Shah, "Oral Healthcare System for Elderly in India," *Geriatrics & Gerontology International* 4, no. 1 (September 2004): 162–164.

[31] Ibid.

[32] See UN Millennium Development Goals Indicators, http://mdgs.un.org/unsd/mdg/Data.aspx (Eradicate Extreme Poverty and Hunger/Target 1C/Population Undernourished/Percentage/Vietnam).

[33] Ibid.

[34] Vietnam News Agency, "UN Praises Vietnam's Efforts to Reduce Malnutrition," *Nhan Dan*, March 4, 2008, http://www.nhandan.com.vn/english/life/040308/life_9t.htm.

[35] Thuy Anh, "Vietnam Sets Up Obesity–Malnutrition Institute," *Thanh Nhien News*, July 31, 2007, http://www.thanhniennews.com/healthy/?catid=8&newsid=30570.

[36] Minh Duc Nguyen, Shirley Beresford, and Adam Drewnowski, "Trends in overweight by socio-economic status in Vietnam," *Public Health Nutrition* 10, no. 2 (August 2006): 115–121.

as 2006, UNICEF's Progress for Children Report suggested that South Africa's situation with regard to undernutrition was going backwards, with the proportion of underweight children rising by an average of 5.6 percent per year since 1994–95.[37] In urban areas, where the impact of globalization is most strongly felt, new lifestyles, the belief that "big is beautiful," and misconceptions that being thin is a sign of HIV/AIDS or tuberculosis infection, have all contributed to a rise in the prevalence of overweight and obesity. A national survey conducted in 1998 found that nearly one third of men and more than half of all women were either overweight or obese.[38]

The prevalence of diabetes in South Africa is low relative to the industrialized world. In 2006 only 2 percent of South Africans were suffering from the disease, compared to 8 percent in Europe and North America.[39] However, the International Diabetes Federation warns that the prevalence may be higher than estimated due to the country's low capacity to diagnose and treat the disease.

II.

Selected Nutrition Interventions: Breastfeeding, Salt Iodization, and Vitamin A Supplementation

Overview

Breastfeeding, salt iodization, and vitamin A supplementation are three important program strategies that help children get a healthy start in life. Infants and toddlers who are introduced to all three of these factors before the age of two are much better equipped to withstand the long-term health risks they may face as a result of their environment and lifestyle.

Each of these interventions represent a different complementary approach to addressing undernutrition:

- Breastfeeding is a **critical natural intervention** that the majority of women are able to implement without outside tools apart from some education and support.
- Salt iodization is a **fortification strategy** that involves the simple addition of iodine into salt, one of the most commonly and uniformly consumed foods throughout the world, with little variation by geographic region or economic status.
- Vitamin A can be delivered through **supplements**, which represent another family of nutrition interventions. As a fat-soluble vitamin, high doses of vitamin A supplements only need to be taken once every 4–6 months and have been found to be one of the most cost-effective measures to reduce child mortality.

BREASTFEEDING. The WHO and UNICEF consider exclusive breastfeeding to be the best way to feed a child during the first six months of their life. Breastmilk protects infants from diarrhea and acute respiratory infections; stimulates their immune systems and improves response to vaccines; and contains many health-enhancing molecules, enzymes, proteins, and hormones.

Approximately 1.5 million young infants die each year as a result of:

- a lack of knowledge about the benefits of exclusive breastfeeding
- improper infant and young child feeding practices, such as the incorrect use of breast milk substitutes

[37] "Progress for Children Report: A Report Card on Nutrition," UNICEF, 2006.

[38] D. Bradshaw, T. Puoane, K. Steyn et al., "Obesity in South Africa: The South African Demographic and Health Survey," Obesity Research 10, no. 10 (2002): 1038–1048.

[39] Ibid.

(e.g., infant formulas) and premature introduction of inappropriate complementary foods.[40]

In response, numerous awareness campaigns have been launched by national governments, multilateral organizations, and nongovernmental and private sector organizations across the globe to educate mothers and families about the benefits of exclusive breastfeeding, and thus encouraging its practice. Though it has been proven that exclusive breastfeeding significantly reduces the risk of mother-to-child HIV transmission, many HIV-positive mothers exacerbate infant feeding problems by mixing breastmilk with other fluids or foods.[41] This not only compromises babies' immunity to diseases, but it also *increases* the risk of mother-to-child HIV transmission. This is why *exclusive* breastfeeding is key.

SALT IODIZATION. The daily consumption of iodized salt can help prevent a host of diseases, including iodine deficiency disorder (IDD), mental retardation, miscarriages, and goiter. Universal salt iodization is one of the most successful public health interventions in the second half of the 20th century, in both industrialized and developing countries. The proportion of households using adequately iodized salt has increased from 25 percent in the early 1990's to just over 70 percent, a success achieved through the partnership of governments, the salt industry, and UN agencies, most notable UNICEF.[42] Because of this success, millions of children are born each year protected from the adverse effects iodine deficiency.

Still, 30 percent of households do not have access to adequately iodized salt and efforts are underway to accelerate progress towards reaching universal salt iodization in all countries of the world.[43] Insufficient incentives for companies and corporations to produce iodized salt, as well as a lack of general public awareness of the benefits of iodized salt are among the primary barriers to closing the gap for truly *universal* salt iodization.[44]

VITAMIN A SUPPLEMENTATION. Vitamin A deficiency (VAD) is a public health problem in more than half of the world's countries. Those most vulnerable to VAD are pregnant women and children. According to the WHO, an estimated 250 million children worldwide are vitamin A deficient. Of these children, an estimated 250,000–500,000 become blind every year, a common result of VAD.[45]

Vitamin A supplementation is one of the most cost-effective interventions for improving child survival. It can be implemented at a large scale and has been proven to reduce the number of preventable child deaths by approximately 23 percent in countries where VAD is endemic.[46] UNICEF recommends that all children 6–59 months living in vulnerable areas of the globe receive high doses of vitamin A every 4–6 months. Vitamin A is found naturally in many foods, including: carrots, broccoli, sweet potatoes, eggs, and chicken. Since the 1990s, many developing countries have also begun exploring vitamin A fortification in different food vehicles, including milk, margarine, oil, sugar, and rice.

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[40] The factors for these deaths are threefold: (1) milk powder is mixed with unsafe drinking water, (2) expensive formulas cause many mothers to over-dilute the powder with more unsafe water, and (3) instant formulas lack many natural ingredients transmitted through the mother's breast milk.

[41] "On the 15th Anniversary of World Breastfeeding Week, UNICEF Says Initiating Breastfeeding within One Hour of Birth Could Greatly Reduce Neonatal Diseases," *UNICEF Media Center*, August 2007, http://www.unicef.org/southafrica/media_3744.html.

[42] "Standing Committee on Nutrition (SCN) News: Universal Salt Iodization (USI)," UNSCN, 2007.

[43] "Iodized Salt Reaches 70 Percent of Households, Up from 20 Percent in the Early 1990s," *Associated Press*, December 13, 2007, http://www.iht.com/articles/ap/2007/12/12/news/UN-GEN-UN-Iodized-Salt.php.

[44] See "MDG 1: Eradicate Extreme Poverty and Hunger," UNICEF Progress for Children, http://www.unicef.org/progressforchildren/2007n6/index_41509.htm.

[45] See "Micronutrient Deficiencies," World Health Organization, http://www.who.int/nutrition/topics/vad/en/.

[46] "Vitamin A Supplementation: A Decade of Progress," UNICEF, 2007.

Selected Interventions: Country Snapshots

China

BREASTFEEDING. Exclusive breastfeeding in China has been on the decline for the last two decades. As unprecedented economic growth has swept through urban areas of the country and breastmilk substitutes and complementary food manufacturers have found new markets to promote their products, mothers have begun to increasingly turn away from the practice of breastfeeding. In the period 2000–06, 51 percent of infants less than six months of age were exclusively breastfed.[47] In the same time period, 32 percent of infants were breastfed along with complementary foods.[48] In order to popularize knowledge about the benefits of breastfeeding, in 2004 the Chinese government issued a national strategy for infant and young child feeding in accordance with the WHO's global strategy.

SALT IODIZATION. China has achieved the international goal of eliminating IDD by insuring that more than 90 percent of households have adequate access to iodized salt. The country launched its National Iodine Deficiency Disorders Elimination Program in 1990. By 1999 China had already attained 93.9 percent coverage of adequately iodized salt for households.[49] The rate has remained constant since then. According to the World Bank, China's success with regard to iodine deficiency can be attributed in large part to centralized control of its edible salt markets, as well as effective political leadership and organization in this area.

VITAMIN A SUPPLEMENTATION. Despite very few reports of night blindness in China throughout the 1990's, a study conducted in 1999 found that VAD among children was higher than it was originally believed to be. The overall rate in Chinese children was 11.7 percent, with 5.2 percent prevalence in urban areas and 15 percent prevalence in rural areas.[50]

India

BREASTFEEDING. Though the rate is steadily decreasing, infant morbidity and mortality in India is still significantly high. According to India's annual National Family Health Survey (NFHS), approximately 57 out of every 1,000 infants die each year.[51] A majority of these deaths can be prevented through exclusive breastfeeding.

In the period 2000–06, only 46 percent of infants less than six months of age were exclusively breastfed.[52] In the same time period, 56 percent of infants ages six to nine months were breastfed and given complementary foods.[53] India's national infant and young child feeding strategy is in accordance with the WHO's recommendations.[54] Despite input and support from civil society and NGOs in this area, only one in five children are fed according all three recommended practices.[55]

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47 UN Information by Country Database, http://www.unicef.org/infobycountry/index.html.

48 Ibid.

49 See UNICEF Information by Country Database, http://www.unicef.org/infobycountry/index.html.

50 G. Ma, L. Lin, Y. Liu et al, "Survey on Vitamin A Deficiency in Children under 6 Years in China," *Chinese Journal of Preventive Medicine* 36, no. 5 (September 2002): 315–319.

51 "National Family Health Survey (NFHS), India: Key Findings 2005–2006," International Institute for Population Sciences (IIPS) and Macro International, 2007.

52 See UNICEF Information by Country Database, http://www.unicef.org/infobycountry/index.html.

53 "National Family Health Survey (NFHS), India: Key Findings 2005–2006," International Institute for Population Sciences (IIPS) and Macro International, 2007.

54 The WHO's recommendations include: continued breastfeeding or feeding with appropriate levels of calcium if not breastfed; feeding solid or semi-solid food a number of times per day according to age and breastfeeding status; and including foods from a number of food groups per day according to all three recommended practices.

55 "National Family Health Survey (NFHS), India: Key Findings 2005–2006," International Institute for Population Sciences (IIPS) and Macro International, 2007.

SALT IODIZATION. India struggles to provide adequate access to iodized salt to its population, with slightly more than half (51 percent) covered in 2005–06—a 2 percent improvement from the previous year.[56] In 2005 the Government of India estimated that 25 million children were unprotected from IDD. In the past, the availability of homemade non-iodized salt (which is often less expensive and more accessible than iodized salt) has had negative consequences on the health of India's people. Therefore, the Indian government instituted two separate nation-wide bans on the production and sale of non-iodized salt, in 1992 and 2005, respectively.[57]

VITAMIN A SUPPLEMENTATION. In 1976 the Indian government implemented a policy designed to eliminate blindness due to VAD, and today the government recommends that all children under the age of three receive vitamin A supplements every six months, starting at the age of nine months. Nevertheless, the country still has one of the highest VAD rates in the world. According to the 2005–06 NFHS, 25 percent of children ages 20–23 months were given a vitamin A supplement prior to the release of the survey.[58]

Vietnam

BREASTFEEDING. Due to a lack of knowledge about the benefits of exclusive breastfeeding, cultural traditions that interrupt the practice, and improper, uninformed use of breastmilk substitutes in Vietnam, the country has experienced a sharp increase in the use of complementary foods for infants and a sharp decrease in breastfeeding. In the period 2000–06, 17 percent of infants less than six months of age were exclusively breastfed, while 70 percent of infants were breastfed and given complementary foods.[59] As of 2008, the proportion of newborns exclusively breastfed in their first month was 31 percent compared to 82 percent in 1996.[60] Spurred by the recent launch of the Lancet's Series on Maternal and Child Undernutrition in Vietnam on January 17, 2008, the National Institute of Nutrition looks to draw renewed attention to maternal and child health, with particular emphasis on infant feeding practices.

SALT IODIZATION. Vietnam's National Iodine Deficiency Disorders Control (NIDDC) program was launched in 1990, and since then it has achieved remarkable results. In 2005 Vietnam announced that it had achieved the international goal for eliminating iodine deficiency disorders by increasing the proportion of households using adequate iodized salt to 93.9 percent (the international goal is any number greater than 90 percent).[61]

One year after the announcement that Vietnam had achieved this goal, however, a study conducted by UNICEF and the WHO found that the country's achievements had slipped. Data indicated that iodine deficiency disorders were returning in the countryside.[62] The return of these challenges illustrates just how vigilant all countries—not just Vietnam—must remain with fortification efforts.

VITAMIN A SUPPLEMENTATION. In 1988 a WHO study found that the prevalence of xerophthalmia—abnormal dryness of the eyeball due primarily to

[56] Ibid.

[57] Savita Navqi and Anupam Srivastav, "India: Ban on Production and Sale of Non-iodized Salt Will Protect Children," *UNICEF*, June 24, 2005, http://www.unicef.org/infobycountry/india_27575.html.

[58] "National Family Health Survey (NFHS), India: Key Findings 2005–2006," International Institute for Population Sciences (IIPS) and Macro International, 2007.

[59] See UNICEF Information by Country Database, http://www.unicef.org/infobycountry/index.html.

[60] Thuy Anh, "Newborn Feeding Going Out of Fashion in Vietnam: Survey," Thanh Nhien News, March 3, 2008, http://www.thanhniennews.com/healthy/?catid=8&newsid=30416.

[61] "Elimination of Iodine Deficiency Disorders," *UNICEF Media Center*, August 24, 2006, http://www.unicef.org/vietnam/media_4632.html.

[62] "Too Early to Let Down the Iodine Deficiency Disorders Guard in Vietnam," *UNICEF Media Center*, November 2, 2007, http://www.unicef.org/vietnam/media_7546.html.

VAD—in Vietnam was seven times higher than the acceptable international rate (0.5 percent) set by the WHO.[63] This finding convinced the Government of Vietnam to launch a program to eliminate VAD, titled the Vitamin A Deficiency Control Program, in 1988. Since then, the program has had great success. In 1994 a study conducted by Vietnam's National Institute of Nutrition, Helen Keller International, and UNICEF found a .05 percent prevalence rate for night blindness due to VAD among children less than five years of age.[64] According to the WHO, in 2002, 77.5 percent of children ages 6–36 months and 52.4 percent of mothers after delivery received vitamin A supplements in the form of capsules.[65]

South Africa

BREASTFEEDING. Poor infant feeding practices have contributed to high mortality rates among children less than five years of age in South Africa, where two-thirds of neo-natal deaths result from low birthweight.[66] In the period 1999–2006, the prevalence of infants with low birthweight was 15 percent, whereas the percent of infants less than six months of age who were exclusively breastfed was 46 percent.[67]

SALT IODIZATION. Efforts to address IDD in South Africa are spearheaded by the South Africa Iodine Deficiency Disorders Network, which includes the Department of Health, UNICEF, the South Africa Medical Research Council (MRC), and the domestic salt industry. The compulsory iodization of table salt was introduced in 1995. In the period 2000–06, 62 percent of households reportedly consumed iodized salt.[68] Before the implementation of compulsory iodization of table salt, less than one-third of households in South Africa had adequate access to iodized salt.

VITAMIN A SUPPLEMENTATION. In South Africa, children are greatly affected by VAD-related diseases, such as diarrhea. One study found that one-third of children from ages 0–4 years were Vitamin A deficient.[69] The study also found that among children from ages 0–4 years, 28 percent died from diarrheal diseases, 23 percent died from measles, and 21 percent died as a result of malaria. All these deaths were found to be attributable to VAD.[70] In 2008 the government of South Africa launched its national vitamin A supplementation with the objective of reaching 4 million children over a 12 day period ending on September 20, 2008.[71]

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63 Tu Giay, Khoi Huy Ha, Khan Cong Nguyen et al., "Control of Vitamin A Deficiency in Vietnam: Achievements and Future Orientation," *Food and Nutrition Bulletin* 23, no. 2 (June 2002): 133–142.

64 M.W. Bloem, J. Gorstein, and Khoi Ha Huy, "Vietnam: Xerophthalmia Free; 1994 National Vitamin A Deficiency and Protein-Energy Malnutrition Survey," Helen Keller International, Vietnam National Institute of Nutrition, and UNICEF (1995).

65 Ibid.

66 "On the 15th Anniversary of World Breastfeeding Week, UNICEF Says Initiating Breastfeeding within One Hour of Birth Could Greatly Reduce Neonatal Diseases", *UNICEF Media Center*, August 2007, http://www.unicef.org/southafrica/media_3744.html.

67 See UNICEF Information by Country Database, http://www.unicef.org/infobycountry/index.html.

68 Ibid.

69 Debbie Bradshaw, Beatrice Nojilana, Norman Rosana Norman et al., "Estimating the Burden of Disease Attributable to Vitamin A Deficiency in South Africa in 2000," *South African Medical Journal* 97, no. 8 (August 2007): 748–753.

70 Ibid.

71 "South Africa Launches its First Ever Vitamin A Supplementation," *Vitamin Information Center*, September 2008, http://www.vitamins5.com/2008/09/27/south-africa-launches-its-first-ever-vitamin-%E2%80%9Ca%E2%80%9D-supplementation-campaign/.