Cambodian J. Int'l. Studies **1**, 133-144

An Evaluation of Maternal and Child Healthcare, with an Emphasis on Malnutrition and Anemia, in Cambodia

Kro Meng

The University of Cambodia, Northbridge Road, Phnom Penh, Cambodia

Abstract

Maternal and infant healthcare in Cambodia has faced many problems for the past several years. Cambodia has one of the highest maternal mortality rates in the region, and malnutrition is costing millions of dollars of year in addition to diminished quality of life. While the vast majority of pregnant women receive iron tablets, only a fraction of them take the supplements regularly, which contributes to anemia and increases the chance of malnutrition. This in turn increases the likelihood of women dying during delivery, as well as giving birth to anemic infants who experience slower rates of growth and higher risks of mortality. Rates of anemia and malnutrition have changed little in children under 5 years old over the past decades, though the infant mortality rate has decreased from the first half of the decade. The author gives recommendations on improving maternal and child health care, including expanding health education to pregnant women, testing anemia at health centers, increasing funding for skilled midwives to implement outreach services, and increasing cooperation between the government and NGO sector to improve overall sanitation, hygiene, and development.

I. Introduction

The Ministry of Health of the Royal Government of Cambodia developed the health sector strategic plan for 2008-2015 to improve the health status of Cambodian people. This plan focused on extending access to and coverage of health services, especially comprehensive reproductive, maternal, newborn, and child health services. This included both the demand and supply side through mechanisms such as operating agencies, exemptions for the poor, health equity fund, and health insurance. Cambodia has been progressing in the development of the health sector over the last 20 years. Cambodia aims to achieve the Millennium Development Goal 4 (MDG 4) to reduce child mortality and MDG 5a to reduce maternal mortality. Many international and local NGOs, the Ministry of Health, and other involved

Ministries have strongly focused on infant and maternal health development in Cambodia to reduce infant and maternal mortality during and after pregnancy. The United States of America was the largest supporter of the budget for the Cambodian health sector between 2003 and 2010, providing about US$79.5 million throughout that time period to reinforce the health sector. Japan is the second-largest contributor with US$65.8 million (MOFA, 2012).

Approximately 70,000 adolescent women worldwide have died every year from pregnancy and childbirth complications. Cambodia has one of the highest maternal mortality rates in the region, which was 17 deaths per 1000 mothers in 2014. Most maternal deaths are preventable, especially when women receive antenatal care (ANC), are educated about pregnancy related complications, and are able to access delivery services with skilled birth attendants (UNFAP, 2014). Malnutrition is a problem in Cambodia with economic losses estimated at USD 266 million including annual spending for solving the problem of malnutrition. Consequent stunting was estimated to reduce economic output by more than US$120 million and iodine deficiency by about US$57 million (Moench-Pfanner *et al.*, 2015).

More than 50% of Cambodian children under 5 years of age who die prematurely are malnourished. Improving child nutrition and food security will therefore directly reduce child mortality. Food insecurity and malnutrition are associated with most major risk factors for maternal mortality. Cambodian women and mothers suffer from high rates of malnutrition, resulting in illnesses that negatively affect maternal and young children's health. The Cambodia Demography Health Survey (CDHS) 2014 showed that more than 90% of pregnant women get iron tablets when they visit the health center for their ANC check-up. The International Relief and Development organization found that only 57% of pregnant women took iron tablets or syrup for 90 days as recommended (IRD, 2014).

The prevalence of malnutrition and anemia in children under 5 years of age and pregnant women has not much improved after 4 years of developing infant and maternal health programs in Cambodia. Many children are still stunted, wasting, and underweight especially in rural areas. The nutrition for children in Cambodia did not meet the 2015 Cambodia Millennium Development Goal (CMDG) target. Stunted and underweight children were 32.4% and 23.9% respectively – in comparison to the set target of 24.5% and 19.2% by 2015 (CDHS, 2014).

This article aims to study the status of the health care of pregnant woman in Cambodia, investigate malnutrition in both pregnant women and children, and propose recommendations for the improvement of Cambodia's health care for pregnant women in an effort to improve infant and maternal health

II. Antenatal Health Care

The health care that Cambodian mothers receive during pregnancy and at the time of delivery is important for the survival and well-being of both the mother and the child. Antenatal care (ANC)[1] from a trained midwife is vital in monitoring the pregnancy and reducing morbidity risk for the mother and child during pregnancy and delivery. Well-implemented ANC programs provide proper treatment of complications during pregnancy such as anemia and infections, and iron tablets and nutritional education are directly provided by midwives or health center staff during ANC visits (USAID, 2014). Official ANC visits also provide an opportunity to disseminate health messages to women and their families. Approximately 95% of pregnant women received ANC visits from midwives at least once (CDHS, 2014). However, only 33% of pregnant women who received ANC visits did so four times as recommended by the World Health Organization (WHO) (Fiedler *et al*., 2014).

1. Iron Tablets

The national guidelines for the use of iron/folic acid (IFA) supplementation to prevent and treat anemia for women during pregnancy and postpartum was developed in 2007. The recommended dose of iron in pregnancy and during the postpartum period is 60 mg per day. Iron and folic acid supplementation should be started as soon as possible during pregnancy and continued through the postpartum period (MoH, 2012). Women need to take iron tablets during pregnancy, especially in the first three months, in order to help fetal growth and improve maternal health. Iron is important because it enhances hemoglobin, which helps red blood cells store and carry oxygen around the body. Without enough iron in the blood, the organs and tissues in the body will not get sufficient oxygen for the pregnant woman and her developing fetus(es).

[1] Antenatal Care (ANC) is a type of preventive health with regular check-up that allow doctors or midwives to treat and prevent health problem during pregnancy. ANC also provides pregnant women with the appropriate information from midwives related to healthy pregnancy, safe children and postnatal recovery including care of newborn, exclusive breastfeeding and assistance with deciding on future pregnancy in order to improve pregnancy outcome.

Approximately 96% of pregnant women have received iron tablets from midwives when they receive ANC check-ups at health centers (CDHS, 2014). However, only 57% of pregnant women took iron tablets for 90 days or more as recommended, and 3% did not take any tablets during pregnancy due to not understanding the significance of IFA to the health of their babies and themselves. Moreover, it may be caused from an inadequate provider counseling and follow up, women's beliefs about actual or possible side effects, and/or socio-cultural factors. Anemic pregnant women need to take 180 IFA tablets over the course of their pregnancy, but in reality, 98% of women did not consume all of them. This could be because an inadequate supply of IFA tablets at the health clinic, women may not receive enough tablets because they do not conduct ANC visits regularly, they start ANC late in their pregnancy, they do not follow the advice of skilled midwives, they may forget to take the tablets daily, or they may fear side effects such as having a big fetus, which could make delivery more difficult (Fiedler *et al*., 2014).

2. Nutritional Education

Cambodia does not have any research studies which research the extent to which midwives provide nutritional education to pregnant women during ANC visits at health centers. Cambodia needs more research findings on this topic to improve infant and maternal health. Thailand has conducted a research study by asking about the knowledge pregnant women gained from ANC visits. The results showed that 68.28% of pregnant women obtained good knowledge related to pregnancy (Lino *et al.*, 2011), comparable with 65.5% of pregnant women in Indonesia after getting good advice from midwifes during ANC visits (Agus and Horiuchi, 2012). Research studies have been conducted in the United Kingdom that explores the education, knowledge and attitude towards nutrition during pregnancy. The results showed that 86% of midwives had no formal nutrition education relating to pregnant women and about 75% of midwives were not qualified to provide nutrition advice for pregnant women, especially to vegetarian women and ethnic women. Additional research in the United Kingdom stated that midwives have poor knowledge in areas such as recommended weight gain, recommended increase in energy requirement (required calorie intake), and for women at risk of iron-deficiency (anemia) and folic acid requirements during pregnancy. Moreover, a research study in New Zealand stated that the majority of midwives said that nutrition was important during pregnancy. About 94.9% of midwives have provided education on nutrition to pregnant women. However, their nutrition education was not informed by professional training, and the role of midwives is unclear in terms of what guidance they should be

providing to pregnant women (Arrish *et al*., 2014). Nutritional education from midwives is important for pregnant women, and Cambodia needs to improve the educational knowledge available to pregnant women. However, this is not uncommon, because even in developed countries such as the United Kingdom and New Zealand this service is often erratic and inconsistent.

III. Malnutrition in Pregnant Women

Maternal malnutrition can cause serious long-term effects for the health of the Cambodian people and for its economic development. Poor nutritional status at the time of conception and inadequate nutritional food consumption during pregnancy may increase the likelihood of women dying during delivery, and also has a negative impact on birth weight and early childhood development. Women who are anemic during their pregnancy give birth to infants who, in turn are anemic, which slows their growth and increases their risk of mortality. Low birth weight provides a heavy financial burden on the health system and causes higher mortality rates and increases the likelihood of disabilities. The financial burden on the health system is not just for treating low birth weight babies; it also includes dealing with the negative impact of low birth weight on health outcomes in adult life (Maternal Nutrition Fact Sheet-Cambodia, 2013). Most of the economic burden for adults is caused by stunting and micronutrient deficiency. More than 3.3 million adults suffer from anemia and chronic weakness, impacting the labor output by US$138 million annually in Cambodia (WFP, 2013).

1. Prevalence of Anemia in Pregnant Women

Anemia is a critical public health problem in Cambodia that affects more than 55-56% of citizens (CDHS, 2014; WVC, 2014). Common causes of anemia, characterized by a low level of hemoglobin in the blood, include inadequate intake of iron, folate, vitamin B12, and other nutrients. Anemia can also result from thalassemia, sickle cell disease, malaria, and intestinal worm infestation. Anemia may be an underlying cause of maternal mortality, miscarriage, premature birth, and low birth weight. Iron and folic acid supplementation and antimalarial prophylaxis for pregnant women, promotion of the use of insecticide-treated bed nets by pregnant women and children under age 5, and deworming for children are some important measures that should be used to reduce anemia prevalence among vulnerable groups.

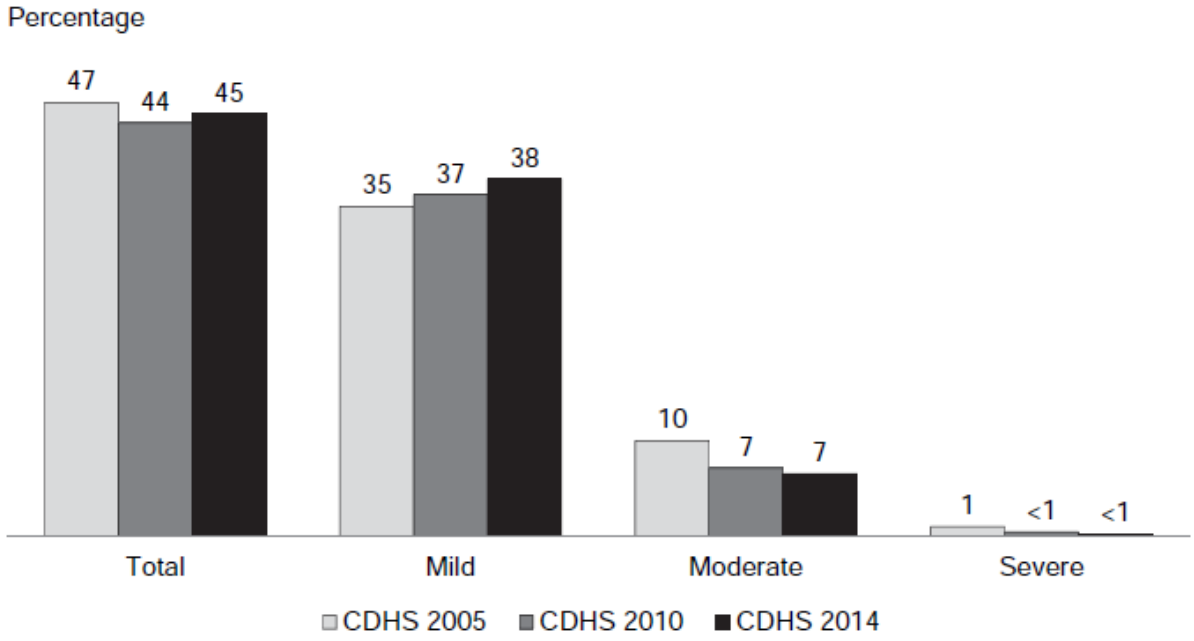

Figure 1 Trends in anemia status among women age 15-49 (CDHS, 2014).

The prevalence of anemia in Cambodian women between ages 15-49 has remained stable for the past 4 years during the development of the government's infant and maternal health program. Approximately 45% of pregnant women in Cambodia are anemic including 38% with mild anemia, 7% with moderate anemia and less than 1% with severe anemia (CDHS, 2014). According to figure 1, the prevalence of mild anemia in pregnant women has increased from 37% to 38% in 2010 and 2014, respectively. About 20.5% of women have a folic acid deficiency, which is strongly associated with premature births and neural tube defects. Zinc deficiency in Cambodian women is about 30.4% while iron and vitamin A deficiency are 8.1% and 4.7%, respectively (Wieringa *et al.*, 2016). Mild and moderate anemia causes a weak immune system, reduced cognitive ability and overall decreased quality of life. Severe anemia reduces a women's ability to survive bleeding during and after delivery and is a major cause of maternal mortality. Moreover, anemia during pregnancy is a main cause of the high rate of premature deliveries and low birth weight in Cambodia (Charles *et al*., 2012).

2. Maternal Mortality Rates

Mothers are dying during delivery because of a lack of health services, midwives, and medicine even though maternal health care services are improving. The number of women in Cambodia who die during childbirth remains high because of a lack of outreach on the part of

public health officials as well as rural villager's preference for traditional midwifes (Kunthear, 2009). The maternal mortality rate in Cambodia was about 200 deaths per 100,000 live births in 2013. Cambodia's Ministry of Health Annual Report reported that there were 116 cases of maternal mortality in 2013. Denise Shepherd-Johnson, UNICEF Cambodia's chief of communications, mentioned that the number of maternal deaths at home or in private health facilities might have gone unrecorded by the government (San, 2014). Two years later, in 2015, maternal mortality had decreased but still remained high, at 170 per 100,000 live births. (CDHS, 2014; UNICEF, 2016), with 509 recorded maternal deaths (WHO *et al.*, 2015).

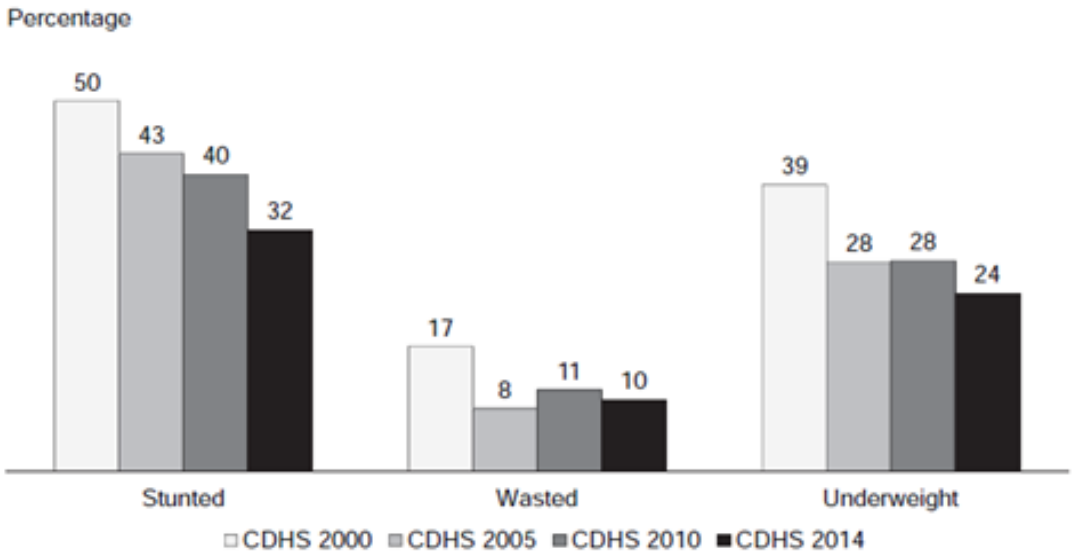

Figure 2 Trends in nutritional status of children under age 5 (from CDHS, 2014).

IV. Malnutrition for Children under 5 years of age

Children under 5 years of age still face malnutrition problems such as being underweight (28%), stunting (40%) and wasting (11%). These conditions are caused by improper feeding and inadequate clean water and sanitation, which increase diarrhea prevalence in children (UNICEF, 2013). Figure 2 states that stunted children less than 5 years of age suffer that condition because their mothers were underweight or malnourished during pregnancy. The percentage of stunted children has slightly changed between 2010 and 2014, 40% and 32%, respectively. This prevalence is caused from mother's having low education related to ANC and maternal health during pregnancy. The number of stunted children in rural areas is higher than in urban areas. Moreover, the statistics for the prevalence of wasting children under 5 years of age has remained unchanged. Mothers in rural areas generally have the lowest wealth quintiles and poor education on pre and postnatal care (CDHS, 2014).

1. Prevalence of Anemia in Children

Anemia remains a problem in children, as well as pregnant women as discussed above. Figure 3 shows that the prevalence of anemic children under 5 has remained relatively the same over the past 10 years. The percentage of anemia has increased despite over 4 years of new policy implementation for preventing anemia, from 55% and 56% in 2010 and 2014, respectively. The children in rural areas are more likely to be anemic than children in urban areas. Children in the poorest households and mothers who have low education are the most vulnerable to anemia (CDHS, 2014). One more thing is that anemia in children can be caused from anemic mothers getting during pregnancy, which can lead to premature deliveries and low birth weight of babies. One of the best ways to improve nutrition for children is through appropriate breastfeeding practices. Exclusive breastfeeding is important for children's nutrition during the first six months of life. Moreover, raising awareness on pregnancy education and dietary diversification programs are needed for long-term development progress (WVC, 2014).

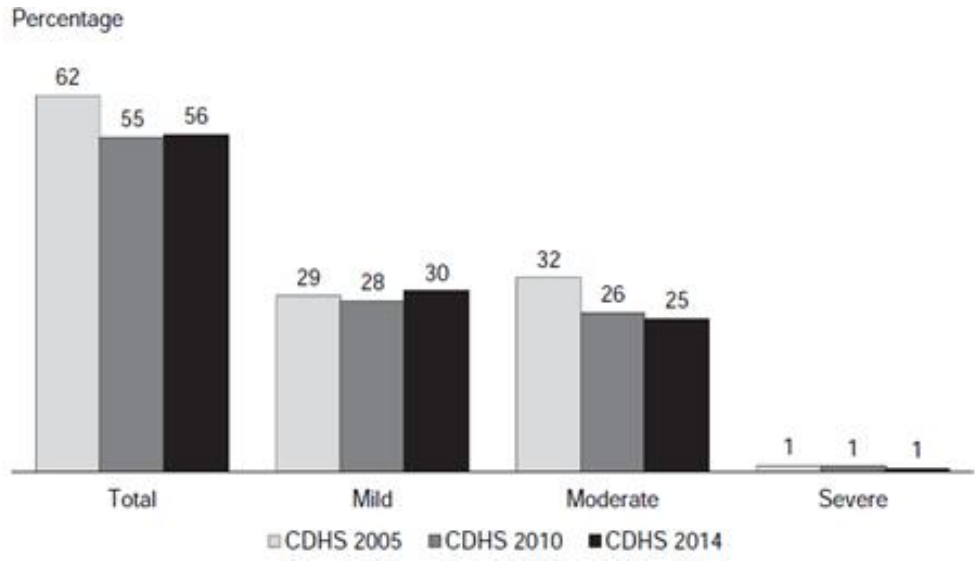

Figure 3 Trends in anemia status among children under age 5 (CDHS, 2014).

2. Infant Mortality Rates

Infant mortality declined from 45 deaths to 28 deaths per 1,000 live births between the 2010 and the 2014 CDHS studies. Cambodia's national infant mortality rate remains stubbornly high at about 27 deaths per 1000 live births (Wilson, 2016). Proper nutrition and health care during the first 1000 days of a child's life are crucial for survival. The majority of infections and conditions caused by malnutrition happen during this period. Mothers must learn how to

feed and take care of the baby to prevent infections, especially lung infections (Wilson 2016). Prematurity is the highest cause of neonatal deaths due to the prevalence of malnutrition and anemia in women during pregnancy in Cambodia.

V. Conclusions

Infant and maternal health development in Cambodia still faces many challenges. Infant and maternal mortality rates have decreased compared with the 2014 CHDS development report, but the prevalence of children under 5 years of age who are stunted, wasted, and underweight has not improved, and the amount of children who get mild, moderate, and severe anemia remain stubbornly unimproved. The prevalence of women who get anemia has not improved because of continued micronutrient deficiencies during pregnancy in such as iron, vitamin A, folic acid and zinc. Pregnant women and anemic women during pregnancy do not follow the guidelines of anemia treatment by taking 180 mg iron tablets (2 tablets a day for 3 months) for improving their anemia status. Many do not take all the recommended iron tablets due to a lack of supply because of irregular ANC visits, starting ANC late in pregnancy, not following the skilled advice from their midwife, forgetting to take their tablets, or fear of potential side effects such as a fear of having a big fetus, which makes delivery more difficult. Moreover, Cambodia's lack of outreach services to support pregnant women in rural areas is a huge contributor to the stagnation of maternal and infant mortality, anemia and malnutrition rates.

According to the health sector development on infant and maternal health in Cambodia, the malnutrition status for pregnant women and children under 5 still face many problems. The prevalence of children, who are stunted, wasted and underweight are identically high as the number of anemic women during pregnancy. The following are a few recommendations for the Royal Government of Cambodia in order to improve the infant and maternal health sector:

1. Health centers have to develop policies or regulations for midwives to give nutritional education to all pregnant women during their ANC visits at health centers, especially for women who are having a baby for the first time and are coming for their first ANC visit. Nutritional education is important in order to improve fetal growth and maternal health care during pregnancy and delivery, and encourage mothers to continue ANC visits by explaining the importance of nutrition and supplementation. Midwives must follow all educational guidelines issued by the Ministry of Health to

coach the pregnant women on their nutrition. Health center chiefs should monitor midwives during appointments to ensure pregnant women are well educated on nutrition.

2. The Cambodia Demographic Health Survey (CDHS) has been using the HemoCue photometer as an instrument to test the blood of women seeking to find out their anemia status during survey research conducted in the field. Pregnant women should be tested for their anemia status during ANC visits at health centers, and this instrument provides easy and accurate readings. Midwives should test mothers at every visit in order to investigate the anemia status of women (mild, moderate or severe), and then provide them with the proper treatment and education. All health centers should be equipped with a HemoCue photometer. Therefore, the Ministry of Health should provide a HemoCue photometer and a set of instruments for testing to health centers across the nation, especially in rural areas where the prevalence of anemia is high. The Ministry of Health should also provide training to all midwives on how to use this equipment before implementing new blood testing regulations.
3. Outreach services in rural areas are very important for adolescent girls and pregnant women. Outreach services should be performed by skilled, trained midwives who have enough experience to properly educate the women. Pregnant women should be encouraged to ask any questions when they meet problems. The Ministry of Health should provide more funds for skilled midwives to implement outreach services to rural pregnant women. All midwives' activities must be facilitated by health center chiefs, and these outreach programs should be properly overseen and implemented. This incentive is important to encourage them to perform their outreach responsibilities and to ensure the sustainability of household coaching services.
4. Poverty, underdevelopment, and low socioeconomic status are major root causes of malnutrition in Cambodia. Malnutrition is aggravated by poor feeding and care practices for infants and young children, as well as poor sanitation and hygiene. Moreover, a lack of access to education, quality health care and safe drinking water can have negative effects on nutrition. Therefore, the Royal Government of Cambodia should cooperate with the non-governmental sector, stakeholders and international donors to develop health projects such as providing nutritious food for consumption, education, and safe drinking water, and a homestead food program to improve the health and nutritional status of rural people.

References

Agus, Y., and Horiuchi, S. (2012) Factors influencing the use of antenatal care in rural West Sumatra, Indonesia. *BMC Pregnancy Childbirth* **12**, 9.

Arrish, J., Yeatman, H., and Williamson, M. (2014) Midwives and nutrition education during pregnancy: A literature review. *Women and Birth* **27**, 2-8.

CDHS (2014) *Cambodia Demographic and Health Survey*. National Institute of Statistics, Directorate General for Health. https://dhsprogram.com/pubs/pdf/FR312/FR312.pdf.

Charles, C.V., Summerlee, A.J., and Dewey, C.E. (2012) Anemia in Cambodia: Prevalence, etiology and research needs. *Asia Pacific Journal of Clinical Nutrition* **21**, 171-181.

Fiedler, J., D'Agostino, A., and Sununtnasuk, C. (2014) *Nutrition Technical Brief: A Rapid Initial Assessment of the Distribution and Consumption of Iron–Folic Acid Tablets through Antenatal Care in Cambodia*. Arlington, VA: USAID/SPRING Project. 12 pp. http://data.unicef.org/corecode/uploads/document6/uploaded_pdfs/corecode/Trends-in-MMR-1990-2015_Full-report_243.pdf

IRD (2014) Report of the End of Project Evaluation of the Evidence-Based Interventions for Improved Nutrition to Reinforce Infant, Child and Maternal Health in Cambodia Project.

Kunthear, M. (2009) High maternal mortality rate blamed on lack of outreach, *The Phnom Penh Post*. http://www.phnompenhpost.com/national/high-maternal-mortality-rate-blamed-lack-outreach

Lino, Y., Sillabutra, J., and Chompikul J. (2011) Factors related to the perception of pregnant women regarding antenatal care in Nakonpathom province, Thailand. *Journal of Public Health and Development* **9**, 105-116.

Maternal Nutrition Fact Sheet-Cambodia, 2013. Accompanied by fact sheet on Early Childhood Nutrition. Updated with Secondary Analysis of Cambodia Demographic and Health Surveys 2000-2010.

Ministry of Foreign Affairs of Japan, 2012. Evaluation of Assistance to the Health Sector in Cambodia. Third party evaluation report, Mizuho Information and Research Institute.

Moench-Pfanner, R., Silo, S., Laillou, A., Wieringa, F., Hong, R., *et al*. (2015) The Economic Burden of Malnutrition in Pregnant Women and Children under 5 Years of Age in Cambodia. *Nutrients* **8**, 292. http://www.mdpi.com/journal/nutrients

MoH (2012) *National Policy and Guideline for Micronutrient Supplementation to Prevent and Control Deficiencies in Cambodia*. Royal Government of Cambodia: Ministry of Health. https://extranet.who.int/nutrition/gina/sites/default/files/KHM%202012%20Micronutrient%20Supplementaiton.pdf

UNFPA (2014) *Midwives, emergency care key to reducing Cambodia's maternal deaths*. United Nations Population Fund http://www.unfpa.org/news/midwives-emergency-care-key-reducing-cambodia%E2%80%99s-maternal-deaths

UNICEF (2014) *Annual Report 2013 – Cambodia*. http://www.unicef.org/cambodia/UNICEF_Cambodia_annual_report_2013.pdf

UNICEF (2016) *Annual Report 2015 – Cambodia*. http://www.unicef.org/about/annualreport/files/Cambodia_2015_COAR.pdf

USAID (2014) *A Rapid Initial Assessment of the Distribution and Consumption of Iron-Folic Acid Tablets through Antenatal Care in Cambodia*. Spring Nutrition Technical Brief Series.

WFP (2014) *A Damage Assessment Report: The Economic Consequence of Malnutrition in Cambodia*. World Food Program. https://www.wfp.org/content/damage-assessment-report-economic-consequences-malnutrition-cambodia

WHO, UNICEF, UNFPA, World Bank Group and the United Nations Population Division (2015) *Trends in Maternal Mortality: 1990 to 2015*.

Wieringa, F.T., Dahl, M., Chamnan, C., Poirot, E., Kuong, K., *et al*. (2016) The High Prevalence of Anemia in Cambodian Children and Women Cannot Be Satisfactorily Explained by Nutritional Deficiencies or Hemoglobin Disorders. *Nutrients* **8**, 348. www.mdpi.com/journal/nutrients

Wilson, A. (2016) Fighting infant mortality with phone alerts. *The Phnom Penh Post*. http://www.phnompenhpost.com/national/fighting-infant-mortality-phone-alerts

WVC (2014) World Vision International in Cambodia – Child Health Now Campaign. http://www.wvi.org/sites/default/files/Cambodia_Policy_Brief_2014%20Update%20-%20English.pdf