ORIGINAL RESEARCH

MATERNAL REPORTS OF CHILD HEALTH PRACTICES IN HO CHI MINH CITY, VIETNAM

CLARICE N. CHAU[1], KATHRYN H. JACOBSEN[1] and BAO NGOC VU[2]

[1]Department of Global & Community Health, George Mason University, Fairfax, Virginia, USA and [2]Center of Preventive Medicine, Khanh Hoi, Ho Chi Minh City, Vietnam.

Corresponding author: Dr Kathryn H. Jacobsen (kjacobse@gmu.edu)

ABSTRACT

Objectives: To examine current rates of participation in several child health practices promoted in the 1980s in urban Vietnam as part of the GOBI (growth monitoring, oral rehydration therapy, breastfeeding, immunisation) initiative. Methods: In the 1980s during the GOBI campaign, District 4 of Ho Chi Minh City offered community-based child health classes focused on the four GOBI areas. In 2008, 297 mothers of children aged 5 or younger in District 4 were interviewed about their child health practices. Results: In total, 84% of mothers reported using a growth chart for their child, 56% reported treating diarrhoea with oral rehydration therapy, 75% reported breastfeeding their child for at least some duration, and 98% said their child had received at least one immunisation. Additionally, nearly all women reported treating drinking water, about three-quarters reported washing their hands regularly, over two-thirds reported using insecticides in the home, and just over half reported that they and their children slept under a bed net. Conclusions: Mothers in the 2000s reported fairly high levels of adherence to the core child health practices promoted by the GOBI initiative in the 1980s. The rates of healthy parenting practices in this study appeared similar to those reported in the 1990s and higher than those from the early 1980s prior to the implementation of GOBI.

KEY WORDS: Child health; GOBI; Maternal knowledge; Health behaviour; Vietnam.

SUBMITTED: 27 October 2010; ACCEPTED: 8 February 2011

INTRODUCTION

Several major global initiatives aimed at increasing child health and survival have been implemented in recent decades. While participating countries are typically asked to create routine statistical reports on the impacts of programs during the initiative, reporting usually does not continue after the conclusion of the global initiative. As a result, it can be challenging to demonstrate whether behavioural changes related to the global programs are sustained after the end of these initiatives.

In the 1980s, UNICEF set the target of significantly increasing child health status in developing nations, and identified four key target areas for child health and survival, known by the acronym "GOBI": Growth monitoring, Oral rehydration therapy (ORT) for diarrhoea, Breastfeeding, and Immunisations to prevent infectious diseases (UNICEF, 1983; Cash et al., 1987). GOBI was designed to involve families and communities in improving child nutrition and health status and to expand access to primary health care and to low-cost interventions (UNICEF, 1983).

Each of the four GOBI areas had a low supply cost and a high effectiveness rate (UNICEF, 1983; Cash et al., 1987). Simple growth charts are effective in identifying children with or at risk of nutritional and growth deficiencies so that they can receive nutritional support. A solution of clean water, sugar, and salt made from ingredients that are usually readily available in the home can significantly decrease the risk of dehydration in children with diarrhoea when provided by caregivers (Fontaine et al., 2007). Exclusive breastfeeding of infants through their first six months of life is a low-cost way to ensure adequate nutrition and reduce the risk of diarrhoea associated with unclean water. Immunisation against six important preventable diseases that can cause death or long-term disability (tuberculosis, diphtheria, tetanus, pertussis, polio, and measles) became feasible as vaccine production costs became lower (UNICEF, 1983).

Since the 1980s when the GOBI initiative was implemented, significant improvements in child health and child survival have been achieved worldwide. By 2000, most countries across the globe had incorporated growth monitoring and early intervention for at-risk children into routine child health care practices (de Onis et al., 2004). The annual number of worldwide deaths from diarrhoea had decreased by about 65% from 1980 levels as ORT use in developing countries increased in about 70% of cases (Victora et al., 2000). About 40% of infants in their first six months of life in developing countries were exclusively breastfed (Lauer et al., 2004), and about three-quarters of children in developing countries had been vaccinated against the six infections that were part of the initial GOBI vaccination package (Ehreth, 2003).

Still, while the success of the GOBI program was due to its simple focus on a limited number of health issues, GOBI was a limited approach to child health and survival precisely because it focused on such a narrow number of interventions. In response, in 1992 UNICEF and the World Health Organization (WHO) phased out GOBI and initiated a new child health care approach called Integrated Management of Childhood Illness (IMCI), which aimed to improve family and community health practices, increase the case management skills of health workers, and build capacity in health care systems for the prevention and treatment of common causes of child morbidity and mortality (Lambrechts et al., 1999). Before IMCI, many of the world's prevention programs were

 copyright
Published by the Anton Breinl Centre of Public Health and Tropical Medicine, James Cook University

focused solely on one disease or condition, a very vertical approach, but IMCI encouraged the development of holistic and horizontal approaches to care (Kelley and Black, 2001). For example, a child with acute diarrhoea would normally be treated with ORT under the GOBI strategy, while under IMCI the mother would be encouraged to not only treat the diarrhoea but to recognize the factors that contributed to causing it and, most importantly, to recognize when the child required more advanced medical care (Pancharuniti, 2004). Alternately, in regions with malaria and other insect-borne diseases, parents would be urged to have their children sleep under insecticide-treated bed nets (ITNs) and encouraged to participate in community vector control efforts (Kelley and Black, 2001).

This paper examines whether specific maternal health behaviours promoted in one part of urban Vietnam via community-based educational programs in the 1980s continue to be practiced by mothers of young children in that area in the 2000s. This analysis provides one example of the possible long-term impacts of time-limited global health programs on community health. National-level statistics provide one type of evidence for programmatic success, but community-level studies are also important for measuring effectiveness.

When the GOBI initiatives were rolled out in the 1980s, Vietnam was in a time referred to as "*doi moi*," which translates roughly as "new life" or renovation. Following the political reformation in 1975, the country had been unified under one political system that was implementing reforms in all major sectors, including health care (Witter, 1996). In the 1980s, the Ministry of Health prioritized primary health care and improved family and community prevention practices, while at the same time moving toward privatization of the health care sector (Witter, 1996; Birt, 1990). With the aid of UNICEF, Vietnam was able to implement programs to address all four key aspects of the GOBI initiative (Tanumidjaja, 1982). Continued efforts in the 1990s significantly contributed to gains in child health, especially in the priority areas identified by GOBI (Pham, 2001). In the late 1990s, Vietnam was in the early implementation phase of IMCI (WHO, 2007). In the 2000s, national guidelines and strategies emphasized the importance of training local health workers in case management skills (WHO, 2007). However, no systematic examination of current child health practices has been recently conducted to determine the possible lasting impact GOBI had on child health in communities that were specifically targeted by educational programs in the 1980s.

To better understand current family-based child health practices in Ho Chi Minh City, Vietnam, we conducted a survey in 2008 of nearly 300 mothers visiting a paediatric clinic with their preschool-aged children. Our specific objectives were: (1) to evaluate whether the GOBI practices that were widely promoted in the 1980s and early 1990s continue to be reported by mothers of pre-school children in Ho Chi Minh City; (2) to examine how reported behaviours in one district of Ho Chi Minh City in 2008 compare to the child health practices reported in studies from urban Vietnam conducted in the 1980s and 1990s when GOBI was being promoted; and (3) to determine whether mothers in the 2000s were practicing additional healthy behaviours that were not included in the GOBI campaign but may have been promoted as part of the expanded IMCI program.

METHODS

Study location

Ho Chi Minh City (HCMC), in southern Vietnam, is the country's largest metropolitan area. This cross-sectional study was conducted in District 4 of HCMC, a small 4.2 km^2 triangular plot in the middle of the city, bordered by the Saigon River and the Ben Nghe and Kinh Te canals, southeast of the commercial centre and northwest of industrial areas. District 4 is home to about 192,000 people — 2.8% of the city's 6.8 million residents — but occupies only 0.2% of the city's land area, giving the district a very high population density of about 45,000 people per km^2 (HCMC, 2008). During the 1980s when the GOBI initiative was in full force, community health education classes and seminars were held in District 4 (Birt, 1990), so knowledge of the core child health practices was expected to be common twenty years ago. This history makes District 4 an ideal community for studying whether child health knowledge continues to be strong in the community twenty years after those classes.

Study participants

Data were collected between June and August 2008. Participants were recruited from the paediatric unit of the District 4 Hospital, known as the Pediatric Clinic of Ho Chi Minh City, which is the only paediatric-specific public clinic in the district, as well as from several randomly selected mobile clinics and pharmacies in the district. Government paediatric clinics (age 0-6 years) charge no fees for services, so they are widely used by community residents. All women attending the clinic with a son or daughter who was five years old or younger were eligible to participate, and all mothers who were registered for a clinic appointment on the days when the survey was being administered were approached and invited to complete a survey. District 4 had an estimated population of about 190,000 at the time of data collection (HCMC, 2008), of which about 8.4% (UNICEF, 2008), or about 16,000, were under age 5. This means that, using conservative estimates (a hypothesized frequency of exposure of 50%), a sample size of about 265 mothers of preschool-aged children drawn from this population would yield a statistical power of about 90% to detect a difference of 5%. Our sample size was 297.

Interview

After confirming that the child accompanying the mother was no more than five years old, a consent statement was read aloud to the mother. The survey goals and procedure were explained, and potential participants were assured that participation would not cause them to lose their spot in the queue or otherwise alter the time it took to be seen by a clinician. All eligible mothers chose to participate. Most interviews were completed in less than 15 minutes. The survey asked about household demographics, the home environment, knowledge and behaviours in each of the GOBI categories, and additional knowledge and behaviours questions about hand-washing and vector control. All questions were close-ended. To minimize the influence of other mothers on participants' answers and to ensure the privacy and comfort of participants, all interviews were conducted in a private area away from the main waiting area.

Statistics

Analyses were conducted with SPSS version 16.0 (Chicago, Ill.) and Epi Info version 3.5.1 for Windows (U.S. CDC, Atlanta, Ga.), with a significance level of α=0.05. The sample population was stratified for analysis by maternal age, maternal education, and

 copyright
Published by the Anton Breinl Centre of Public Health and Tropical Medicine, James Cook University

the number of children, as shown in Table 1. Chi- square tests were used to examine differences in the distribution of responses for these maternal characteristics. These results are presented in Table 2. Chi-square tests were used to compare each level of maternal age, education, and number of children to all other levels. These results are presented in the text. Analysis of variance (ANOVA) was used to examine differences in mean breastfeeding duration for various groups of mothers.

Ethical considerations

The research protocol was approved by the Institutional Review Board of George Mason University (Fairfax, Virginia, USA) and the District 4 Center of Preventive Medicine (Ho Chi Minh City, Vietnam). No inducement was offered to participants. All participants provided written documentation of consent.

RESULTS

Demographics

All of the 297 women attending the clinic with a child no more than 5 years old who were invited to participate completed an interview, yielding a 100% participation rate among eligible women. Table 1 summarizes demographic characteristics of participating mothers and Table 2 presents the proportion of participants who reported various healthy behaviours.

Table 1: Demographic characteristics of 297 participating mothers.

Characteristics	
Mean age (SD)* [years]	30.2 (5.4)
< 20 years	0.3%
20-24 years	11.5%
25-29 years	37.5%
30-34 years	29.0%
35-39 years	16.0%
≥ 40 years	5.7%
Mean years of education (SD)	10.5 (3.2)
≤ 8 years	23.0%
9-12 years	58.2%
≥ 13 years	18.8%
Mean household size (SD) [# people]	5.1 (2.4)
Mean number of children (SD)	1.5 (0.8)
1 child	55.6%
2 children	38.4%
3 children	5.4%
≥ 4 children	0.6%
Mean number of children less than five years (SD)	1.1 (0.4)

*SD = standard deviation

Table 2: Proportion (%) of participants (n=297) reporting engaging in various healthy behaviours and p-values for Chi-square tests comparing responses by maternal age, education, and number of children.

Health behaviour	%	Age	Education	Children
Child vaccinated (any vaccine)	98	0.876	0.884	0.767
Child growth chart	84	0.411	0.020*	0.947
Understand growth chart	79	0.067	0.016*	0.615
Wash hands before eating	77	0.211	0.537	0.166
Wash hands after using the toilet	76	0.565	0.880	0.049*
Boiled tap	76	0.270	0.767	0.866
Carries vaccination card	75	0.026*	0.212	0.437
Breastfed child	75	0.626	0.926	0.840
Diarrhoea treatment with extra fluids	73	0.290	0.762	0.397
Aerosol pesticide	71	0.230	0.883	0.424
Wash hands before cooking	70	0.136	0.869	0.005*
Child ITN use	58	0.489	<0.001*	<0.001*
Mom ITN use	56	0.627	0.492	0.562
Diarrhoea treatment with ORT**	56	0.745	0.114	0.590
Filtered tap	47	0.793	0.857	0.969
Larvacide	40	0.870	0.995	0.633

*p-value for the chi-square test less than 0.05; ORT = Oral rehydration therapy

copyright
Published by the Anton Breinl Centre of Public Health and Tropical Medicine, James Cook University

Growth monitoring

A total of 84% of mothers reported that they maintained a growth chart for their children. Mothers in their twenties ($p<0.001$) and those with more education ($p=0.006$) were more likely than other women to maintain a growth chart, but there were no differences based on the number of children in the household ($p=0.947$). Of the women who kept a growth chart for their child, 94% (79% of all women) said that they understood how to interpret a growth chart. Of all the mothers, those who did and did not maintain a growth chart for their children, 88% replied that it was important to know their child's weight on a regular basis, with the majority saying that it was important "for overall health" and "to make sure the child is eating right." Nearly three-quarters of mothers (71%) reported that they thought their child was "average size for age," while 16% felt that their child was smaller than average and 11% thought their child was larger than average. Mothers who thought their child was "average" were more likely than other mothers to maintain a growth chart for their child ($p<0.001$).

Oral rehydration and diarrhoea prevention

About 12% of the mothers reported that their child had at least one episode of diarrhoea in the two weeks before the interview. Although almost three-quarters (73%) of the women reported treating their child's diarrhoea with extra fluids, only about half (56%) reported using oral rehydration therapy (ORT). ORT was described as using "oresol," an oral glucose electrolyte solution that is widely used and can be homemade or purchased at a low price. Use of ORT did not differ by the age ($p=0.745$) or education level of the mother ($p=0.114$) or by the total number of children in the household ($p=0.590$).

While treating diarrhoea with ORT is important, preventing diarrhoeal diseases is also a child health priority. About three-quarters of women reported washing their hands after using the toilet (76%), before preparing food (70%), and before eating (77%). Inconsistency in hand-washing at these times could contribute to the spread of diarrhoeal pathogens. The majority (91%) of women reported treating their drinking water by boiling it (76%) and/or filtering it (47%), and 24% used bottled spring water. Only 2% said that they drank untreated tap water.

Since a critical aspect of preventing child mortality is seeking professional medical assistance when required, especially for acute infections, the survey also asked about whether mothers felt that there were any barriers to accessing health care for their children. In total, 69% of the mothers reported that they had at some time delayed seeking medical care for their child: 40% because they preferred treating their children with traditional medicine and waiting to see if their child got better, 10% because of time issues, 10% because of the location of the clinic or hospital, and 9% because of cost-related issues. Overall, mothers preferred at-home remedies to professional care.

Breastfeeding

Three-quarters (75%) of mothers reported breastfeeding their child for at least some duration. In total, 4% reported breastfeeding their child, who they brought to the clinic, for less than 1 month, 11% for 1 to 3 months, 21% for 4 to 6 months, 24% for 7 to 12 months, and 16% for 13 to 24 months. By ANOVA, breastfeeding initiation did not differ by maternal age ($p=0.212$), education ($p=0.558$), or number of children in the home ($p=0.111$). Mean breastfeeding duration also did not differ significantly based on maternal age ($p=0.797$), education ($p=0.182$), or number of children ($p=0.698$).

Immunisation and infectious disease prevention

Nearly all (98%) mothers reported that their child had received at least one vaccination. When asked to list the most important vaccines for a child to receive, the most popular responses were hepatitis B virus (50%), polio (28%), meningitis (26%), measles (24%), Japanese encephalitis (21%), tuberculosis (16%), tetanus (14%), and chickenpox (11%). Three-quarters of mothers (75%) reported keeping a vaccination card for their child. Immunisation is only one method for preventing infectious diseases, so the survey also asked about other disease prevention practices. Only about half of participants reported that they (54%) or their children (56%) usually slept under a bed net. In total, 70% of mothers reported using aerosol pesticides to kill adult insects in the home, but 16% reported the presence of stagnant water around the house where mosquitoes could breed. Although 65% of the women reported recognizing mosquito larvae, only about 40% participated in active use of larvacides.

DISCUSSION

Our study suggests that most GOBI focus areas continue to be practiced by mothers of preschool children in Vietnam. We found that 84% of mothers reported using a growth chart, 56% reported treating diarrhoea with ORT, 75% reported breastfeeding for at least some duration, and 98% stated their child had received at least one vaccine. Although no recent survey has examined all four GOBI areas, our findings are supported by several related studies from Vietnam, which are described in the following paragraphs.

Although few studies have examined how widely used growth charts are, most growth charts include vaccination information, and the 2002 Vietnam Demographic and Health Survey (DHS) found that only 40% of 1-year-old children had an immunisation card (CPFC and ORC Macro, 2003). This represented a significant increase from the 13% rate in 1997 (CPFC and ORC Macro, 2003). Our study found that a considerably higher proportion of mothers maintained growth and vaccination records for their children. The goal of growth charts is to allow for early identification of nutritionally at-risk children. Significant progress has been made in reducing the rates of stunting and underweight of children under-5 in Vietnam from 57% and 45%, respectively in 1980, to 36% and 20% in 2000 (UNICEF, 2009b). A 2005 study in Ho Chi Minh City found that only 3% of children 4- to 6-years-old were underweight but about one-third were overweight or obese (Dieu et al., 2007). Because growth monitoring charts facilitate the identification of at-risk children, whether they are in the low or high percentiles of weight, they remain a much-needed tool in Vietnam (UNICEF, 2009b). One concern may be that, in this study, mothers who did not consider their child to be of "average" size were less likely to carry a growth chart, which may mean that the most at-risk children are not identified for early intervention.

In 1992, 87% of children admitted for diarrhoeal disease at Pediatric Hospital No. 1 in HCMC had been treated at home with ORT, up from only 15% in 1987 (Ngoc and Deschamps, 1998).

 copyright
Published by the Anton Breinl Centre of Public Health and Tropical Medicine, James Cook University

The 2002 Vietnam DHS suggested that only about 46% of mothers treat their children's diarrhoea with commercial or homemade oral rehydration therapy even though 70% know what ORT is (CPFC and ORC Macro, 2003). However, the rate of ORT use may be higher in urban areas; a 2002 study in an urban area found that 80% of mothers used ORT when their children had diarrhoea (Pancharuniti, 2004). Recent studies estimate that 13% of all under-5 child deaths in Vietnam are due to diarrhoea, which, although slightly lower than the global average of 16%, still represents a significant number of preventable deaths (UNICEF, 2009b). Recent health promotion campaigns have emphasized extra fluids, continued feeding, and appropriate use of medication, in addition to the use of ORT (Pancharuniti, 2004). One concern with homemade ORT in some locations is contaminated drinking water, but that is unlikely to be a major concern in the study population since nearly all of the participants reported using one or more methods of drinking water treatment. Since participants reported preferring at-home care for most childhood illnesses, ORT promotions that provide mothers with information that allows them to provide quality home-based care are likely to be well received.

In this study, only 75% of mothers reported breastfeeding, which is lower than the rate reported in other studies from Vietnam. For example, 91% of mothers who gave birth to children between 1983 and 1988 in urban areas of Vietnam reported breastfeeding for at least 6 months (Swenson et al., 1993), more than 90% of mothers across Vietnam were estimated to breastfeed their infants for at least 6 months in 2006 (UNICEF, 2009a), and a 2000 study found that 95% of mothers in HCMC reported breastfeeding for at least some duration (Li et al., 2002). One possible contributing factor to the lower breastfeeding rate for women in District 4 is that a large proportion of women with young children in this relatively low-income district work outside the home, and women who work outside the home may not feel that their schedule allows them to sustain breastfeeding (Almroth et al., 2008; Li et al., 2002).

Vietnam began its national immunisation program in 1981, with a target of vaccinating 80% of children under 5 years against the six key GOBI-identified infections (Hong, 1990). In 2001, the Ministry of Health increased the target immunisation rate to 90% (Pham, 2001). The 2002 DHS estimated that 95% of children had received at least one vaccination and 66.7% of children in Vietnam had been vaccinated against all six of the infections included in the GOBI plan (CPFC and ORC Macro, 2003). We similarly found a high rate of maternal reporting that their children had received at least one vaccine. However, the DHS survey raises concerns that the MOH target of most children receiving all critical childhood vaccines is not being met even though parents are open to vaccination.

Other health behaviours not part of the GOBI campaign but promoted with IMCI included hand-washing, water treatment, use of bed nets, and vector control. These behaviours are less codified under IMCI and thus had a lower reported rate of practice by mothers.

The main limitation of our study is the potential lack of generalizability of the study population to populations outside District 4 of Ho Chi Minh City. District 4 is a relatively poor district within HCMC, which may mean that its residents are not representative of the city as a whole. Furthermore, even if the study participants were representative of HCMC as a whole, they would not be representative of Vietnam as a whole. On average, urban residents are more educated than those in rural areas, and educated mothers may have better child health knowledge than women with less formal education. A second possible concern is the responder bias that can occur when interviewees aim to please interviewers by providing "correct" answers rather than truthful ones. The use of self-reported information is another possible source of information bias. Participants may have overestimated their adherence to healthy childcare practices, or intentionally given misleading self-reports. However, the variability in responses and the large number of "incorrect" answers suggest that this was not a major issue for the study population.

We found fairly high levels of reported adherence to the core child health practices promoted by the GOBI initiative. These proportions appear similar to those reported in the 1990s but considerably higher than those from the early 1980s before the implementation of GOBI. We found that participants were more likely to report following GOBI practices than other, less codified behaviours promoted by IMCI and other more recent child health initiatives, such as hand-washing, water treatment, use of bed nets, and vector control. This observation has relevance to international audiences as well as to Vietnam specifically, since it suggests that emphasizing a limited number of specific child care behaviours in communities is more likely to result in lasting behaviour change than a larger and vaguer set of advice. It also highlights the possibility of well-designed global health initiatives resulting in long-term change in health status of communities.

ACKNOWLEDGEMENTS

The authors are grateful for the assistance of Dr. Vu Nguyen Thanh, Director of the District 4 Center of Preventive Medicine; Mrs. Pham Thi Thuy Phuong; the fifth year medical students of Ho Chi Minh University of Health Science who served as interviewers, especially Ms. Pham Nhu Hao and Dr. Vu Bao Khanh; and all of the participants.

REFERENCES

Almroth S, Arts M, Quang ND, Hoa PTT, Williams C. (2008) Exclusive breastfeeding in Vietnam: an attainable goal. *Acta Pædiatrica;* 97:1066-9.

Birt CA. (1990) Establishment of primary health care in Vietnam. *British Journal of General Practice;* 40:341-4.

Cash R, Keusch GT, Lamstein J. (1987) Part One: Components of GOBI-FFF pp. 11-98. In: Child Health and Survival: the UNICEF GOBI-FFF Program, Croom Helm, London.

CPFC and ORC Macro. (2003) Vietnam Demographic and Health Survey 2002. Committee for Population, Family, and Children and ORC Macro, Hanoi.

de Onís M, Wijnhoven TMA, Onyango AW. (2004) Worldwide practices in child growth monitoring. *Journal of Pediatrics;* 144:461-5.

Dieu HT, Dibley MJ, Sibbritt D, Hanh TT. (2007) Prevalence of overweight and obesity in preschool children and associated socio-demographic factors in Ho Chi Minh City, Vietnam. *International Journal of Pediatric Obesity*; 2:40-50.

 copyright
Published by the Anton Breinl Centre of Public Health and Tropical Medicine, James Cook University

Ehreth J. (2003) The global value of vaccination. *Vaccine*; 21:596-600.

Fontaine O, Garner P, Bhan MK. (2007) Oral rehydration therapy: the simple solution for saving lives. *British Medical Journal*; 334(suppl 1):s14.

HCMC Statistical Office. (2008) Population and Population Density in 2008 by Districts. Cited June 2010. http://www.pso.hochiminhcity.gov.vn/so_lieu_ktxh/2008/Dan_so_va_lao_dong/0201.htm (in Vietnamese)

Hong LD. (1990) The expanded program on immunization in Vietnam. *Asia Pacific Journal of Public Health;* 4:125-7.

Kelley LM, Black RE. (eds.) (2001) Research to support household and community IMCI: Report of a meeting, 22-24 January 2001, Baltimore, Maryland, USA. *Journal of Health Population Nutrition;* 19(2):S111-S148.

Lauer JA, Betrán AP, Victora CG, de Onís M, Barros AJD. (2004) Breastfeeding patterns and exposure to suboptimal breastfeeding among children in developing countries: review and analysis of nationally representative surveys. *Bio Med Central Medicine*; 2:26.

Lambrechts T, Bryce J, Orinda V. (1999) Integrated management of childhood illness: a summary of first experiences. *Bulletin of the World Health Organization;* 77: 582-94.

Li L, Lan DTP, Hoa NT, Ushijima H. (2002) Prevalence of breast-feeding and its correlates in Ho Chi Minh City, Vietnam. *Pediatrics International;* 44:47-54.

Ngoc PT, Deschamps JP. (1998) Global approach to diarrhea in children in Vietnam: the experience of paediatric hospital number one in Ho Chi Minh City. *Sante Publique;* 10:87-98.

Pancharuniti N, Shiyalap K, Dung NM, Wongsawass S. (2004) Maternal practice on management of acute diarrhea among children under five years old, in Nam Dinh City, Vietnam. *Journal of Public Health and Development;* 2:31-40.

Pham GK. (2001) Approving the national target programs to prevent and combat some social diseases, dangerous epidemics and HIV/ AIDS in the 2001-2005 period. Ministry of Health, Hanoi, Vietnam Report No.190/2001/QD-TTg.

Swenson IE, Thang NM, Tieu PX. (1993) Individual and community characteristics influencing breastfeeding duration in Vietnam. *Annals of Human Biology;* 20: 325-34.

Tanumidjaja TM. (1982) General condition of children in the Indo-Chinese peninsula and the type of UNICEF programmes. *Southeast Asian Journal of Tropical Medicine and Public Health;* 13:301-5.

UNICEF. (1983) State of the World's Children 1982-83. UNICEF. New York.

UNICEF. (2008) State of the World's Children 2009. UNICEF. New York.

UNICEF. (2009a) Infant and young child feeding (2000-2007). Statistics and Monitoring, Division of Policy and Practice. UNICEF. New York.

UNICEF. (2009b) Tracking Progress on Child and Maternal Nutrition. UNICEF. New York.

Victora CG, Bryce J, Fontaine O, Monasch R. (2000) Reducing deaths from diarrhoea through oral rehydration therapy. *Bulletin of the World Health Organization;* 78: 1246–55.

Witter S. (1996) 'Doi Moi' and health: the effect of economic reforms on the health system in Vietnam. *International Journal of Health Planning and Management;* 11: 159-72.

WHO. (2007) Child Survival Profile: Vietnam. World Health Organization Regional Office for the Western Pacific. Philippines.

 copyright
Published by the Anton Breinl Centre of Public Health and Tropical Medicine, James Cook University