Antenatal Care Visits Four Times or More of Women Aged 15-49: Situation, Trend, and Determinants from Multiple Indicator Cluster Surveys Analyses

Nguyen Huu Minh, Tran Thi Hong, Tran Quy Long*

Abstract: While Viet Nam has been successful in achieving economic growth, poverty reduction and gender equality, the country cannot avoid exposure to a variety of disasters due to climate change, as it is among the most prone regions to disasters in the world. This paper will show that climate change and its impacts are not gender neutral and nor are its policies and actions. Because of prevailing gender inequalities, women are likely to be more affected than men. Sensitivity to climate change varies and is particularly strong amongst poorer, rural women, including those from ethnic minorities, who tend to rely on natural resources and climate-sensitive livelihood activities. Due to their gender-defined roles in society and traditional patterns of marginalization, women are amongst those that are likely to carry the heaviest burdens from these changes and benefit less the policies and programmes that address these, though they play a crucial role in Viet Nam. Not only do they comprise almost half of its population, but they also play important roles at the household level, in the rural and urban economies and in society as a whole. The paper also shows that women should not be seen as 'victims'. They are also crucial actors in climate change adaptation (CCA) and disaster risk reduction (DRR), and their needs and knowledge should be used to inform the design, implementation, and monitoring of climate change and CCA/DRR policies.

Key words: Gender; Equality; Climate change; Adaptation; Disaster; Risk reduction.

* Nguyen Huu Minh, Prof. Ph.D; Tran Thi Hong, Ph.D; Tran Quy Long, MA;
Institute for Family and Gender Studies
Address correspondence to minhngaanh@yahoo.com

1. Context and Methods

1.1. Context

Improving maternal and child health is always a major priority for the Vietnamese government. The government commitment to improving this was demonstrated through the country's impressive achievements of Millennium Development Goals (MDG) goal 4 and goal 5, which focused on reducing mortality in children and improving maternal health.

The World Health Organization (WHO) has recommended that all women attend at least four ante-natal care (ANC) visits at fourth, sixth, seventh, eighth, and ninth month of pregnancy. The goal of the ANC visit is not only to prepare for birth and parenthood, but also detect, treat, and prevent potential health problems throughout the course of the pregnancy. ANC improves the survival and health of babies directly by reducing stillbirths and neonatal deaths and indirectly by providing an entry point for health contacts with the woman at a key point in the continuum of care (WHO, 2015).

Statistics in Vietnam usually analyze percentage of pregnant women who take antenatal care at least three times during pregnant period based on Ministry of Health (MOH) standards. Data from the Population Change and Family Planning Surveys from 2006 to 2016 indicate a considerable improvement in attending at least three ANC visits among pregnant women, from 60.3% in 2006 to 88.2% in 2016, expressed in both urban and rural areas as well as in all economic regions in Viet Nam. Particularly, a higher increase in percentage of women attending at least three ANC visits was observed in areas where economic conditions are under developed and where access to health services is still limited such as in Central Highlands or Northern Midlands and Mountain (GSO, 2017). A longitudinal study, which was conducted among 3921 households in three provinces including Thai Nguyen, Khanh Hoa and Vinh Long in 2008-2009 and 2013-2014, shows that the proportion of mothers with at least four ANC visits during pregnancy increased from 10% to 46% over a 5 year period (VASS & Social Science Research Council, 2016).

In spite of this progress, disparities in coverage of ANC services persist between regions and groups. In particular, there remain stark disparities in utilization of four or more ANC services during pregnancy among women in different regions and ethnicity groups in Viet Nam. However, rare studies have been conducted to examine trends and factors associated with attending four or more ANC visits in the recent years. Further studies and analysis are, therefore, needed to provide scientific evidence and inform the development and implementation of policies and interventions to increase the coverage of four or more ANC visits among pregnant women.

The results of the aforementioned studies (see also Tran Khanh Toan & Nguyen Hoang Long, 2014) show that, regardless of the standard, the percentage of women having ANC at the prescribed number of times (at least 3 or 4 visits) has an increasing trend in the group of people with better-off living standards and those who have had children in recent years. The results also show that mothers of ethnic minorities, mothers who do simple works and mothers with less than primary education have the lowest rate of antenatal check-ups than others. However, the trends of each social group are still less analyzed. The relationship between the socio-demographic characteristics or the residence of the mothers with their ANC status is usually only analyzed through bivariate correlation. There have been no multivariate regression analyzes to identify factors that actually affect the number of times of ANC visits required by the WHO. Therefore, the use of MICS data to find out the factors that influence the rate of 4-times of antenatal care visits and a trend of ANC visits for each related social group will not only provide up-to-date and nationally representative information on these issues, but also provide scientific evidence for the development and implementation of policies and programs that promote ANC visits of pregnant women more effective.

The purpose of this paper is: *1) To identify factors affecting access to, and use of, four or more ANC visits among reproductive women, as recommended by WHO; 2) To analyze trends in ANC 4-times visits using 2011 and 2014 MICS data.*

1.2. Data and Analytical Methods

Data

The analysis was conducted using 2011 and 2014 MICS data. MICS is the largest household survey on children's and women's well-being and is conducted to collect reliable and timely data on the situation of children and women at the national, urban-rural, provincial and regional levels in the country. MICS indicator 5.5b was used for most of the analysis. This indicator specifies the *percentage* of *women age 15-49 years with a live birth in 2 years preceding the survey who were attended during childbirth by skilled health personnel*. A total sample of women belonging to this category was 1,464 in MICS 2014 and 1,363 in MICS 2011.

Dependent variable

A binary variable indicating if women aged 15-49 years with a live birth in two years preceding the survey who were attended during childbirth by skilled health personnel.

Independent variables

Mothers' characteristics: Education levels; Age at the time of pregnancy; - Status of children (giving birth for the first time or giving birth many

times); If the pregnancy was wanted at the time of conception; Birth year of the child.

Family characteristics: Ethnicity of household heads; Family economic status (5 categories based on a household wealth index).

Residency and ecological regions: Residency (urban and rural); Six geographical regions: Red River Delta, Northern Midlands and Mountain, Northern Central Coast and South Central Coast, Central Highlands, South-East, and Mekong River Delta.

Analytical methods

Bivariate correlations were analyzed using chi-squared test (X^2) and multivariate analysis using logistic regression models were used to identify relevant factors associated with four or more ANC visits among pregnant women. Odds ratios (OR), 95% confidence level and the p-value were estimated. P-value <0.05 is considered statistically significance.

1.3. Limitations

This paper was written based on the secondary analysis of existing MICS data that were collected to provide general information on the situations of women and children in Viet Nam. A number of factors that were hypothesized to affect pregnant women's four or more ANC visits were not collected and therefore, the analysis had some limitations. In addition, data concerning "*number of women age 15-49 years with a live birth in the 2 years preceding the survey who were attended during childbirth by skilled health personnel*" was only collected from MICS 2011 and 2014, therefore, the analysis in this area was limited to 2011- 2014.

2. Situation of women aged 15-49 years with four or more ANC visits using 2014 MICS data and affecting factors

The results indicate that 73.7% pregnant women attended at least four ANC visits during the pregnancy in 2014. However, the proportion of women attending four or more ANC visits remains low among those who lived in the rural, central highland and northern mountain areas, and among women who had lower education, lived in poor households and lived in ethnic minority-headed households.

As seen in Table 1, there was a significant difference in attending four or more ANC visits among women who gave birth for the first time and those gave birth many times. Over 80% of women who gave birth for the first time attended four or more ANC visits, contrasting to 68.9% of women giving multiple births attended four or more ANC visits. While accessing to ANC is affected by several factors, those giving birth for the first time tended to seek ANC visits, possibly due to being more interested in having babies and getting advice from health providers to ensure a smooth

pregnancy. On the other hand, those with multiple births may rely on previous experience, and did not feel it necessary to seek ANCs. As demonstrated in previous studies, women who had been pregnant many times were less inclined to go for antenatal care visits because of experience gained from previous pregnancies and births (Hossain, 2010; Vecino-Ortiz, 2008).

Table 1. Comparison of percentage of women who attended four or more ANC visits, 2014

		%	n
Giving birth* **	Having children	68,9	862
	Having no children	80,6	603
Child birth year	2011-2012	73,7	729
	2013-2014	73,7	735
Intended or unintended pregnancy* **	Yes	76,3	1204
	No	64,0	250
Total		**73,7**	**1464**

*** p<0,001. Source: MICS 2014.

The results show that women with intended pregnancies at the time of conception were more likely to attend a minimum number of four ANC visits than those with unintended pregnancies at the time (76.3% vs. 64.0%, p<0.001). Unintended pregnancies have been cited as an important factor influencing maternal health care seeking behavior. For instance, a study in Tanzania reported that mistimed and unwanted pregnancies were significantly associated with delayed initiation of ANC visits among pregnant women (Exavery et al., 2013). Similarly, a study conducted among 1,370 women in southwestern Ethiopia found that women with unintended pregnancies were less likely to receive adequate antenatal care (Wado et al., 2013).

Table 2 presents the results of factors associated with four or more ANC visits made by women aged 15-49 years with a live birth in 2 years preceding the MICS 2014. Women who had upper secondary education were three times more likely to attend four or more ANC visits during the pregnancy compared to those with primary or lower education (OR= 3, 95% CI: 1,9-4,6). Women from better-off families were 7.3 time more

likely to attend at least four ANC visits during the pregnancy compared to those living in the poor family (OR=7.3, 95% CI: 3.8-12.5). Similar findings were documented in the previous studies in developing countries indicating that woman's higher education level was a significant and important factor in determining optimal ANC utilization. Those with higher education level and better income were more likely to attend more ANC visits. Education empowers and helps women to change behavior and encourage them to access to and use of modern health care services (Furuta & Salway, 2006).

Table 2. Multiple logistic regression model on factors associated with having at least four ANC visits using 2014 MICS data

		OR (95%CI)	N
Mother's education level	Primary and lower	1	285
	Lower secondary	1,5***(1,0-2,1)	510
	Upper secondary	3,0***(1,9-4,6)	680
Mother's age		1,1 (0,9-1,2)	1475
Child birth year	2011-2012	1	722
	2013-2014	1,1 (0,8-1,5)	753
Intended or unintended pregnancy	Yes	1	1212
	No	0,7*(0,5-1,0)	263
Have given birth	No	1	611
	Yes	0,6**(0,4-0,9)	864
Ethnicity of household head	Kinh	1	1129
	Ethnic minority	0,3 ***(0,2-0,4)	346
Living condition	Poorest	1	358
	Poor	1,7**(1,1-2,5)	258
	Middle	2,8***(1,7-4,4)	267
	Rich	4,1***(2,4-7,0)	305
	Richest	7,3 ***(3,3-16,1)	287
Residency	Urban	1	558
	Rural	1,04(0,7-1,5)	917
Ecological region	Red River Delta	1	225
	Northern Midlands and Mountainous area	0,98(0,5-1,7)	273
	North Central and Central coastal area	0,5**(0,3-0,9)	222
	Central Highlands	0,6(0,4-1,0)	308
	South East	2,2**(1,1-4,3)	244
	Mekong River Delta	1,3(0,7-2,3)	203

* p<0,05; ** p<0,01; *** p<0,001. Source: MICS 2014.

Table 3. Multiple logistic regression model on factors associated with at least four ANC visits, using 2011 and 2014 MICS data

		MICS 2011	MICS 2014
Mother's education level	Primary and lower	1	1
	Lower secondary	1,3 (0,9-1,9)	1,5***(1,0-2,1)
	Higher secondary	2,5*** (1,6-3,8)	3***(1,9-4,6)
Mother' age		1,0 (0,9-1,0)	1,1 (0,9-1,2)
Child birth year	2008-2009 (reference)	1	
	2010-2011	1,2 (0,9-1,6)	
	2011-2012 (reference)		1
	2013-2014		1,1 (0,8-1,5)
Intended or unintended pregnancy	Yes	1	1
	No	0,7*(0,5-1)	0,7*(0,5-1,0)
Having given birth	No	1	1
	Yes	0,7*(0,5-1)	0,6**(0,4-0,9)
Ethnicity of household	Kinh	1	1
	Ethnic minority	0,4*** (0,3-0,6)	0,3 ***(0,2-0,4)
Living conditions	Poorest	1	1
	Poor	1,8**(1,2-2,7)	1,7**(1,1-2,5)
	Middle	1,9** (1,2-3,0)	2,8***(1,7-4,4)
	Rich	4,2*** (2,5-6,9)	4,1***(2,4-7,0)
	Richest	6,9***(3,8-12,5)	7,3 ***(3,3-16,1)
Residency	Urban	1	1
	Rural	0,8 (0,5-1,1)	1,04(0,7-1,5)
Ecological region	Red River Delta	1	1
	Northern Midlands and Mountainous area	0,6*(0,3-0,9)	0,98(0,5-1,7)
	North Central and Central coastal area	0,7(0,4-1,0)	0,5**(0,3-0,9)
	Central Highlands	0,5** (0,3-0,8)	0,6(0,4-1,0)
	South East	2,0* (1,2-3,7)	2,2**(1,1-4,3)
	Mekong River Delta	1,1 (0,7-1,9)	1,3(0,7-2,3)
		n=1361	n=1475

* p<0,05; ** p<0,01; *** p<0,001. Source: MICS 2011 & MICS 2014.

As anticipated, women lived in Kinh-headed households were more likely to attend four or more ANC visits than those who lived in ethnic-headed households. Women who lived in ethnic-headed households were 30% less likely to attend at least four ANC visits compared to those lived in Kinh-

headed households (OR=0.3, 95% CI: 0.2-0.4). Similar findings were documented in the previous studies in Viet Nam, showing that ethnic minority women utilized less ANC services than Kinh women (Ekman et al., 2007). Limited language communication and cultural differences are major factors preventing ethnic minority women from utilizing ANC services provided by Kinh health workers (UNFPA, 2007). Additional factors including lack of transportation, health providers' unfriendly attitudes and feeling of powerlessness also constitute major barriers for ethnic minority women to utilize ANC services (World Bank, 2009).

Disparities in utilization of ANC services were also observed among regions. Women who lived in the North Central and Central Coast were half times less likely to attend at least four ANC visits than those living in the Red River Delta. Those who lived in the South East region were 2.2 times more likely to attend at least four ANC visits than those who lived in the Red River Delta (OR= 2.2, 95% CI: 1.1- 4.3).

However, mother's age and child birth year were not significantly associated with utilization of four or more ANC visits. In addition, there were no significant differences in taking four or more ANC visits between urban and rural women. While some previous studies show that urban women made more visits and had more adequate ANC than rural women, other studies report no significant differences between urban and rural women (Say & Rain, 2007; Simkhada et al, 2008). A study examining factors associated with ANC visits among pregnant women in India found no significant rural-urban differences in the utilization of ANC (Navaneetham & Dharmalingam, 2002). However, some previous studies in Vietnam and Ghana show that women who lived in the urban areas were more likely to attend ANC visits than those who lived in the rural areas (Dixon, 2014; Tran Khanh Toan et al., 2011).

The analysis did not find any changes in underlying factors affecting four or more ANC visits when comparing 2011 and 2014 MICS data. Mother's education levels, mother with and without children, household living standards and ethnicity remain key factors, significantly affecting four or more ANC visits among pregnant women. These findings highlight the need for development and implementation of innovative policies and interventions that could improve mother's access to education and household living conditions as well as encourage ethnic minority women to utilize ANC services at the health facility.

3. Trends in four or more ANC visits

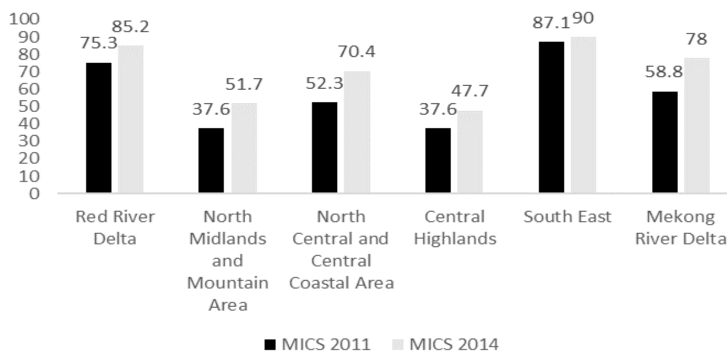
As previously explained, data on four or more ANC visits were only collected in MICS 2011 and 2014, and therefore this paper focuses on trend data on the percentage of women attending at least four ANC visits in

the period of 2011 to 2004. The results show that significant improvements have been made in having four or more ANC visits among pregnant women in this period. The proportion of women attending at least four ANC visits increased from 59.6% in 2011 to 73.7% in 2014.

3.1. Geographical regions

Data indicate that increasing proportion of pregnant women attending four or more ANC visits was recorded across all six geographical regions during the period of 2011 to 2014. Notably, a significant increase was observed among women living in the Mekong Delta (19.2%), North Central and Central Coast (18.1%), and Northern Midlands and Mountainous regions (14.1%). While the proportion of pregnant women attending four or more ANC visits in the Central Highlands and the South increased in the same period, the pace was slower than in the other regions. However, disparities remain. Compared to those who lived in other regions, pregnant women who lived in the North Central Coast and Central Coast recorded the lowest level of attending four or more ANC visits, highlighting the need to develop and prioritize tailor-made policies and programs that promote and increase four or more ANC visits among pregnant women in these regions.

Figure 1. Percentage of women aged 15-49 years who attended at least ANC visits by geographical regions, 2011 and 2014



Source: MICS 2011 and MICS 2014.

3.2. Education

The results of Table 4 indicate an increase in the proportion of women attending at least four ANC visits in all levels of women's education over the period of 2011-2014. The proportion of pregnant women attending at least four ANC visits increased 13.5 percentage points among those with no education, and 16.5 percentage points among those with primary education. While the increasing pace of having four or more ANC visits

were higher among women who had primary and lower secondary education than those with upper secondary school and college in the same period, the latter reported much higher overall rate of four or more ANC visits (81.9% and 94.1%) compared to the former (66.6% and 69.5% among those with lower secondary school and primary education respectively).

Table 4. Percentage of women attending four or more ANC visits by education

Education	MICS 2011	MICS 2014	Differences
No education	5.6	19.1	13.5
Primary	44.0	60.5	16.5
Lower secondary	51.1	66.6	15.5
Upper secondary	69.4	81.9	12.5
College and above	87.3	94.1	6.8

Source: MICS 2011 and MICS 2014.

3.3. Living conditions

Table 5 presents the results of pregnant women attending at least four ANC visits by the living conditions over the period of 2011-2014. The results indicate that women across all categories of living conditions recorded an increase in the proportion of attending four or more ANC visits. However, the strongest increase (22.4%) was observed amongst those who lived in poor families, followed by women who lived in families with middle living conditions (an increase of 18.9%). Those who lived in the poorest families experienced less marked increase in attending at least four ANC visits (11.4%).

Table 5. Percentage of women attending four or more ANC visits by living conditions

Living conditions	MICS 2011	MICS 2014	Differences
Poorest	27.2	38.6	11.4
Poor	45.0	67.4	22.4
Middle	58.8	77.4	18.9
Rich	78.7	89.4	10.7
Richest	88.7	95.9	7.2

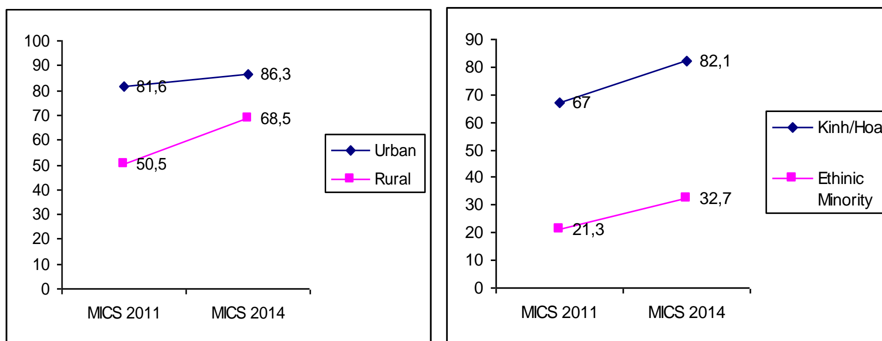
Source: MICS 2011 & MICS 2014.

When taking ethnicity and place of residency into account, the results in Figure 2[(1)] reveal that the proportion of women attending four or more

ANC visits increased from 2011 to 2014. The highest increase was observed among women who lived in the rural area (18 percentage points). Those who lived in a Kinh/Hoa-headed households reported higher percentage of attending at least four ANC visits compared to those who lived in ethnicity-headed households (15.1% vs. 11.4%) in the same period.

It is worth pointing out, that whilst the disparities in having at least four ANC visits between the rural and urban women had narrowed down, the disparities between Kinh/Hoa and other ethnic minority women had widened, increasing from 45.7 percentage points in 2011 to 49.4 percentage points in 2014. As documented in previous studies in Viet Nam, lack of understanding of cultural differences and barriers to communication may have constituted the underlying problems affecting access to and use of ANC services among ethnic minority women (UNFPA, 2007; Vo Van Thang et al., 2004). One study has found that ethnic minority women were hesitating to visit and utilize health clinic services provided by male health workers (Vo Van Thang et al., 2004). Lack of information and knowledge regarding benefits of ANC are another barriers preventing ethnic minority women from utilization of ANC services (UNFPA, 2010).

Figure 2. Percentage of women attending four or more ANC visits during pregnancy by ethnicity and residency, 2011 and 2014



Source: MICS 2011 & MICS 2014

4. Conclusion and recommendation

4.1. Conclusion

This paper offers insight into the characteristics of pregnant women attending four or more ANC visits as well as its associated factors, further contributing to a better understanding of inequalities in access to ANC services among pregnant women in Viet Nam. The results provide policy makers with necessary evidence to develop public health policies and

strategies to increase the coverage of four or more ANC visits among pregnant women.

Data indicate significant progress and overall increase in the proportion of pregnant women attending four or more ANC visits recommended by WHO, further contributing to the reduction of maternal and infant mortality in the past decades in Viet Nam. The proportion of pregnant women attending four or more ANC visits increased from 59.6% in 2011 to 73.7% in 2014. However, data also indicate that underlying major factors affecting four or more ANC visits remain unchanged over the same period.

Despite an overall increasing in undertaking at least four ANC visits was observed in all groups of women from 2011 to 2014, the increase varied widely across groups. Women who had not received any formal education, who lived in the poorest group, and who lived in ethnicity-headed households saw the less marked increased in four or more ANC visits. Women with higher education, living in a household of Kinh/Chinese ethnicity, with better living conditions have a higher rate of attending four or more ANC visits during pregnancy compared to women of other groups. Women who gave birth for the first time were more likely to attend four or more ANC visits than women who had already given birth many times. Women with unplanned pregnancies at the time of conception were less likely to attend four or more ANC visits than those with intended pregnancies at the time of conception.

Whilst the disparities in attending four or more ANC visits tended to narrow down between women in urban and rural areas, the gap between Kinh/Hoa and ethnic minority women had widened.

Data indicate that the proportion of pregnant women undertaking four or more ANC visits increased across all six geographical regions. However, disparities remain among regions. Women living the North Central and Central Coast were haft time less likely to attend at least four ANC visits than those living in the Red River Delta. Women living in the South East region were 2.2 times more likely to make at least four ANC visits than those living in the Red River Delta.

4.2. Recommendations

Based on the above presented results, the following recommendations are made to improve the situation and increase the proportion of women attending four or more ANC visits during pregnancy:

- Develop and implement innovative policies and interventions to reduce inequalities in access to and utilization of ANC services in the country, especially targeting the low education, poor and ethnic minority communities.

- Develop relevant and effective intervention models to increase four or more ANC visits among pregnant women as well as provide affordable ANC services to eligible low education, low-income and ethnic minority pregnant women.

- Develop and implement policies that encourage health providers to provide culturally appropriate and friendly services for ethnic minority pregnant women seeking ANC services, making it more comfortable for them to utilize ANC services.

- Intensify information and communication programs to increase demand for ANC services among pregnant women, with special focus on community-based activities that reach disadvantaged groups such as ethnic minority women and women with the lowest levels of education and low-income.

- Integrate concepts of gender, culture and ethnic sensitivity into training courses for health workers, to alter their perceptions and raise awareness in providing friendly services to pregnant women, especially to more vulnerable women.

- Conduct social and operational research to improve understanding of the cultural, social, economic and structural barriers preventing women from utilizing ANC services.■

Endnote

(1) Due to the lack of respondents' ethinicity information, the ethinicity of household head was used as a proxy indicator.

References

Dixon, J. Tenkorang EY, Luginaah IN, Kuuire VZ, Boateng GO (2014). "National health insurance scheme enrolment and antenatal care among women in Ghana: Is there any relationship?" *Tropical Medicine and International Health*, 19(1), 98-106.

Ekman, B., Axelson, H., Ha Anh Duc & Nguyen Thanh Liem. (2007). Use of maternal health care services and ethnicity: A cross-sectional analysis of Viet Nam. Retrieved from http://papers.ssrn.com/sol3/papers.cfm?abstract_id=993713

Exavery, Amon; Almamy Malick Kanté, Ahmed Hingora, Godfrey Mbaruku, Senga Pemba, James F Phillips. (2013). "How mistimed and unwanted pregnancies affect timing of antenatal care initiation in three districts in Tanzania". *BMC Pregnancy Childbirth* 13, 35 (2013) doi:10.1186/1471-2393-13-35.

Furuta, M., & Salway, S. (2006). "Women's position within the household as a determinant of maternal health care use in Nepal". *Int Fam Plan Perspect. 3*2, 17-27. doi:10.1363/3201706.

GSO. (2017). *Population change and family planning 1/4/2016: main results.*

Hossain, Kishowar, A. H. (2010). "Utilization of antenatal care services in Bangladesh: An analysis of levels, patterns, and trends from 1993 to 2007". *Asia*

Pac J Public Health. 22(4), 395-406. doi: Epub 2010/05/26. doi: 10.1177/1010539510366177 pmid:20498123.

Navaneetham K, Dharmalingam A. (2002). "Utilization of maternal health care services in Southern India". *Soc Sci Med.* 2002;55(10):1849–1869. doi: 10.1016/S0277-9536(01)00313-6

Say L, Raine R. (2007). "A systematic review of inequalities in the use of maternal health care in developing countries: examining the scale of the problem and the importance of context". *Bull World Health Organ*. 85(10):812–819

Simkhada B, Teijlingen ER, Porter M, Simkhada P. (2008). "Factors affecting the utilization of antenatal care in developing countries: systematic review of the literature". *J Adv Nurs.* 61(3):244–260. doi: 10.1111/j.1365-2648.2007. 04532.x

Tran Khanh Toan; Nguyen Thi Kim Chuc; Nguyen Duc Hinh; Bo Eriksson; Goran Bondjers; Karin Gottvall; Henry Ascher; and Max Petzold. (2011). "Urban-rural disparities in antenatal care utilization: A study of tow cohort of pregnancy in Vietnam". *BMC Health Services Research,* 11, 120.

Tran Khanh Toan., Nguyen Hoang Long. (2014). "Utilization of antennal care among women in Ba Vi through longitudinal study from 2005 to 2011". *Journal of Medicine Study*, 91 (5), 78-83.

UNFPA. (2007). *Knowledge and behavior of ethnic minorities on reproductive health.* Hanoi: UNFPA.

UNFPA. (2010). *Knowledge and Behavior of Ethnic Minorities on Reproductive Health.* Hanoi: UNFPA.

VASS & Social Science Research Council. (2016). Provincial study fact sheet on population health study in Thai Nguyen, Khanh Hoa, and Vinh Long provinces. Retrieved from https://s3.amazonaws.com/ssrc-cdn2/ph-study-fact-sheet-4-2016-en-57e16ed3704e1.pdf.

Vecino-Ortiz, A. I. (2008). "Determinants of demand for antenatal care in Colombia". *Health Policy, 86*(2-3), 363-372. doi: 10.1016/j.healthpol.2007.12.002 pmid:18201794.

Vo, Van Thang, Luu Ngoc Hoat, & Jan van Schie, T. (2004). "Situation of the Kinh poor and minority women and their use of the maternal care and family planning service in Nam Dong mountainous district, Thuathien-Hue province, Vietnam". *Rural Remote Health,* 4, 225.

Wado, Y.D., Afework, F.M., & Hindin, J.M. (2013). "Unintended pregnancies and the use of maternal health services in Southwestern Ethiopia." *BMC International Health and Human Rights*, vol. 13, article 36, 2013.

World Bank. (2009). Country Social Analysis. Ethnicity and social development in Vietnam. Summary report. Washington, D.C: The World Bank 2009.

World Health Organization. (2015). Antenatal Care [Accessed Sept 15, 2016]. Available from: http://www.who.int/gho/maternal_health/reproductive_health/antenatal_care_text/en/