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Who provides good quality prenatal care in the Philippines?

Rouselle F. Lavado PhD^{1*}, Leizel P. Lagrada MD MPH PhD², Valerie Gilbert T. Ulep³, Lester M. Tan²

ABSTRACT

This paper attempts to illustrate the quality of prenatal care services provided by different health care providers. **Section I** presents the introduction and overview of the study. **Section II** discusses important information gathered during literature review which was organized into prenatal care and its benefits, recommended practice and discussion of quality of prenatal services. **Sections III and IV** presents the detailed objectives and methodology adapted in the study. **Section V** discusses the results of the analysis. Lastly, **Section V and VI** presents the discussions and policy recommendations.

Background. The MDG targets for the Philippines to reduce the maternal and infant mortality deaths are yet to be reached. The 2008 National Demographic and Health Surveys (NDHS) shows that while 90% percent of pregnant women access prenatal care services from a medical professional, only 60% of them are assisted by medical professional during birth. The quality of care in prenatal care services provided by health professional is not yet known in the literature.

Objectives. To describe the proportion of good quality of prenatal care services provided by doctors, nurses and midwives, and traditional birth attendants, and identify the relationship between economic and demographic variables and the quality of care.

Study Design. The study used a cross-sectional data from the 2003 and 2008 NDHS to compare the two time periods. It used information on 4,907 (2003) and 4,709 (2008) women who were pregnant five years prior to the two surveys.

Outcome Measures. The quality measures during prenatal check-up are: (1) weight checked; (2) height checked; (3) blood pressure taken; (4) urine examination performed; (5) blood sample examination performed; (6) told about pregnancy complications; (7) told where to go for pregnancy complications; (8) received tetanus toxoid injection; and (9) received iron supplementation.

Results. Women who are older, poorer and with lower educational attainment received poorer quality of prenatal care compared to women who are younger, richer and better educated. Multiparous women also received poorer quality of prenatal care. Among the health care providers, doctors provide very good quality of prenatal care while majority of midwives and nurses provide fair quality of prenatal care. Not surprisingly, majority of the traditional birth attendants provide poor quality of prenatal care.

Keywords: quality of prenatal care, prenatal attendants, health services delivery, maternal and child health, reproductive health, health care providers, public health

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I. Introduction

Prenatal care is the use of health care during pregnancy. It is composed of screening for health conditions that are likely to increase the possibility of adverse pregnancy outcomes, providing therapeutic interventions and educating pregnant women about planning for safe child birth. Its importance on maternal and infant health is ascertained by different medical literature (DOH, 2009).

In the Philippines, prenatal care is a widely accepted practice. Almost 96% of mothers had visited a health provider for their prenatal care (NSO and Macro International, 2010). Despite the high prenatal care coverage, morbidity and mortality related to pregnancy are still high. Infant and maternal mortalities are still major problems, where 26 infants in every 1000 live births die and 162 women per 100,000 die due to childbirth. These put the Philippines' IMR still above its Millennium Development Goal target of 19/1000 live births and its MMR way above the target of 52/100,000 live births in 2015 (NSCB, 2010). In this light, extrapolating the other dimensions of prenatal care like quality and comparing it by prenatal attendant (doctors, nurses/midwives and traditional birth attendants) are necessary to further understand these shortcomings.

Prenatal care quality is an important indicator for maternal and infant health status. However, quantity of prenatal care visit is the most commonly used indicator while the quality of prenatal care is seldom used (Alexander, 2001; Alexander and Kotelchuck, 1996; Barber and Bertozzi, 2007). To date, no existing standard protocol is used to measure quality of prenatal care. Some popular studies have used contents of prenatal care (e.g. tetanus toxoid or doctor's advice) to measure the over all quality (Alexander et al, 2001; Victora, 2001). This practice, however, may pose a possible problem especially when important features or components of prenatal care are not taken into account. In this light, this study attempts to develop an antenatal quality index based on the contents adapted from DOH and WHO recommendations.

Using the 2003 and 2008 National Demographic Health Survey (NDHS), this study constructs a scoring system to measure the quality of prenatal care and compares the estimates derived from 2003 and 2008 surveys. This study also examines the quality of prenatal care services provided by different health care providers, and identify the relationship between socio-economic variables of pregnant women and the quality of prenatal care. Finally, the study suggests improvements on the quality of prenatal care in the Philippines.

II. Review of literature

This section presents a review of literature on prenatal care and its benefits and the recommended prenatal services that become the basis for measuring the quality of prenatal care.

Prenatal care and its benefits

Prenatal care refers to pregnancy-related care provided by a health worker either in a medical facility or at home (Matthews and Shanti, 2001). It aims to (1) manage maternal symptomatic problems, (2) manage fetal symptomatic problems, (3) screen and prevent maternal problems, (4) screen and prevent fetal problems, (5) prepare the couple for childbirth and (6) prepare them for childrearing (Chamberlain, 1991). It is necessary that prenatal care should address both the psychosocial and medical needs of the pregnant woman in the context of the health care delivery system and the surrounding culture (Matthews and Shanti, 2001).

In the Philippines, prenatal care is basically performed by different health professionals such as doctors, midwives and nurses. However, some pregnant women still go to traditional birth attendant or *hilots* for their prenatal care. According to the latest survey from the 2008 NDHS, about 39% of women who had live births in the five years preceding the survey reported that they visited a doctor for their prenatal care, fifty two percent (52%) of them visited either a nurse or a midwife while four percent (4%) went to traditional birth attendant (NSO and Macro International, 2010).

The benefits of prenatal care are well recognized. The literature suggests that prenatal care has significant contribution on infant survival and better health outcomes. A handful of studies have established the effect of prenatal care on birth weight. A study in Portugal documented that infants whose mothers received prenatal care are less likely to have low birth weight (Barros and Tavares, 1996). This result was also ascertained by a study in Canada (Mustard and Roos, 1994). This is due to the fact that mothers with prenatal visits are more likely to be informed of their nutritional needs during pregnancy (Barros and Tavares, 1996). On the other hand, mothers without prenatal care are more likely to have pre-term delivery (Krueger and Scholl, 2006; Balcazar and Hartner, 1993). Premature infants are at greater risk for short and long term complications, including disabilities and impediments in growth and mental development. Lastly, prenatal care was also found to prevent infant's death. Few studies have documented that those infants whose mothers had prenatal care have lesser risk of Sudden Infant Death Syndrome (Mitchell et al, 1996). However, the exact biological explanation is still poorly understood. (Schlaud and Kleeman, 1996).

Several studies also suggested that prenatal care may protect mothers from complications due to pregnancy. In a study conducted in the Philippines, it was found that mothers with prenatal care are less likely to experience hemorrhage (Tan, 2004). Prenatal care also protects mothers from pre-eclampsia which is the most common cause of maternal mortality. Prenatal care, timely diagnosis and proper management prevent the complications of pre-eclampsia (Sibai, Dekker, and Kupfermine, 2005). Though some studies challenged the contribution of prenatal care on reducing maternal mortality due to vague and inconsistent study results, its role in monitoring fetal growth, reducing the risk of infection and promoting mother and infant survival is still important since prenatal care serve as a conduit to deliver other health services (Bloom and Lippeveld, 1999; McDonagh, 1996, Campbell and Graham, 2006).

Prenatal care also affects the post partum behavior of the mother like breastfeeding and immunization. Studies conducted in Vietnam, Australia, and Afghanistan found that mothers with prenatal care are more likely to breastfeed (Scott, Binns, and Graham, 2006 and Vu, 2000) and immunize their infants (Hemat, et al, 2009). This is because mothers with prenatal care received advice from their prenatal attendant.

Recommended practice

In 2009, the World Health Organization has released its revised recommendations to improve maternal and newborn health. The guideline gives specific prenatal and postpartum activities to be undertaken by pregnant women. For prenatal care, WHO emphasizes that mothers should observe the quantity and periodicity of prenatal visits (WHO, 2009). It is essential that mothers should have at least 4 prenatal visits to ensure proper care is observed. In the Philippines, the goal of the Department of Health through the Maternal, Newborn, and Child Health and Nutrition (MNCHN) strategy is to have 80% of pregnant women with at least 4 prenatal visits by 2010 and 100% by 2015 (DOH, 2009).

In addition to quantity and periodicity of prenatal care, the WHO also acknowledges the need to standardize the content of prenatal care (Table 1). The recommended content of prenatal care has three main categories: (1) Assessment (including history-taking, physical examination and laboratory tests to identify problems or risk factors), (2) Health promotion (including advice on nutrition, planning the birth, information about danger signs of pregnancy and contingency planning, subsequent contraception and breastfeeding), and (3) Care provision (including iron and folate supplements, tetanus toxoid immunizations, psychosocial support and record-keeping).

Table 1: Recommended content of prenatal care

World Health Organization	Department of Health
<p>Confirmation of pregnancy Tetanus immunization, anemia prevention and control (iron and folic acid supplementation) Recording and reporting</p>	<p>Provision of essential antenatal care services</p> <ol style="list-style-type: none"> 1. Monitoring of height and weight 2. Taking the blood pressure 3. Screening and blood testing including CBC, blood typing, urinalysis, VDRL or RPR, HbsAg, blood sugar screening, pregnancy test, and cervical cancer screening 4. Micronutrient supplementation (iron, folate, Vitamin A) 5. Malaria prophylaxis where appropriate 6. Deworming 7. Birth planning
<p>Monitoring of progress of pregnancy and assessment of maternal and fetal well-being</p>	<p>Measurement of fundic height against the age of gestation, fetal heart beat and fetal movement count to assess the adequacy of fetal growth and wellbeing</p>
<p>Detection of problems complicating pregnancy (e.g., anemia, hypertensive disorders, bleeding, malpresentations, multiple pregnancy) Birth planning, advice on danger signs and emergency preparedness Syphilis testing</p>	<p>Early detection and management of signs of complications of pregnancy Prevention and management of early bleeding in pregnancy Prevention and management of other conditions as indicated (hypertension, anemia, diabetes, tuberculosis, malaria, schistosomiasis, STI/HIV/AIDS) Laboratory screening and medical management of STI-HIV cases and their complications Hepatitis B birth dose immunization</p>
<p>Information and counseling on self care at home, nutrition, safer sex, breastfeeding, family planning, healthy lifestyle</p>	<p>Counseling on Healthy Lifestyle with focus on smoking cessation, healthy diet and nutrition, regular exercise, STI control HIV prevention and oral health. Promotion of exclusive breastfeeding, newborn screening, BCG and Counseling on use of modern FP methods especially lactation amenorrhea (LAM), with focus on health caring and health seeking behaviors; and contraception including surgical procedures where appropriate: bilateral tubal ligation (BTL), no-scalpel vasectomy (NSV) and management of complications resulting from contraception</p>
<p>Respond to other reported complaints</p>	<p>Provision of other support services</p> <ol style="list-style-type: none"> 1. Antenatal registration through active tracking by the WHTs 2. Birth planning 3. Home visits and follow up 4. Safe blood supply 5. Transportation and communication support services

SOURCE: WHO Recommended Interventions for Improving Maternal and Newborn Health (WHO, 2009) and Implementing Health Reforms Towards Rapid Reduction in Maternal and Neonatal Mortality, Manual of Operations (DOH, 2009)

Quality of prenatal care

Despite the scientific evidence on the impact of prenatal care on infant and maternal health, there are several untapped avenues that may bring some perspective on the effectiveness of prenatal care. One of this is exploring the quality and content dimension (Alexander, 2001; Alexander and Kotelchuck, 1996). Conventionally, quantity and periodicity are the most commonly considered dimensions when assessing prenatal care practice (McDonagh, 1996). In the Philippines, quality of prenatal care is not part of the major health indicators commonly used. This is reflected in the Field Health Service Information System wherein quantity and periodicity are included but no direct indicator that measures quality and content of prenatal care is collected.

Despite the value of measuring the quality of prenatal care, many problems arise when defining and measuring the quality of medical care service. One of these problems is the substantial standard variation that may occur since assessing quality must rest on a conceptual and operational definition of what the “quality of medical care” means (Donabedian, 2005; Barber and Bertozzi, 2007). While several studies attempted to examine the quality through the receipt of specific procedure (e.g. urine examination) or care provision (e.g. given tetanus toxoid shot) (Alexander et al, 2001; Victora, 2001), the limitation such method is the exclusion of some of the vital dimensions of prenatal care. However, quality of care can be measured by assessing the degree by which a desired health care process, in this case, the prenatal care, is done. Quality of prenatal care can then be assessed by evaluating the prenatal services provided to the pregnant woman against the recommended contents of prenatal care. A quality index can be created based on the completeness of the components of prenatal care.

III. Objectives of the study

1. To estimate the prevalence of good quality prenatal care in the Philippines using 2003 and 2008 National Demographic and Health Surveys;
2. To determine the difference in quality prenatal care between the 2003 and 2008 estimates; and
3. To determine the association between good quality prenatal care according to health care providers and socio-economic indices.

IV. Study Methods

Source of data and study sample

The 2003 and 2008 Philippine National Demographic and Health Surveys (NDHS) were used in the study. NDHS is a cross sectional survey implemented nationwide by the National Statistics Office. Stratified three-stage sampling design was used to represent the country in seventeen regions. In the first stage, 819 villages (*barangay or contiguous group of barangays*) in each region were selected using the 2000 Census master list. In the second stage, enumeration areas were selected in each village. An enumeration area is defined as an area with discernible boundaries and 150 neighboring households. In the third stage, an average of 17 households was selected from each enumeration area using systematic

sampling (NSO, 2004). Face to face questionnaire-guided interview was used to collect health and demographic related information.

Two data sets were used in the study with the attempt to compare the estimates of the two periods. The data set includes all pregnancies of the mother occurred 5 years prior to the survey. However, in this study only the last pregnancies were considered. Therefore, the study includes 4,907 pregnancies for the year 2003 and 4,709 for the year 2008.

Score Construction

This study proposes measurement of quality of prenatal care by collectively examining its contents following the WHO and DOH protocol on prenatal care. One point score was assigned to each for each prenatal component and a summation of scores was obtained for every pregnant woman in the dataset. The total score was then categorized as: (1) no prenatal care if there was no visit and the score is zero, (2) poor quality prenatal care if the score is 1-3 points, (3) fair quality if the score is 4-6 points, and (4) good quality if the score is 7-9 points.

Table 2: Content of prenatal care

Component	Purpose*	Prenatal care provided by the provider	Point
measuring weight	assess adequacy of fetal growth	Weight checked	yes=1, no=0
measuring height	measured initially to determine if there is a high risk for cephalopelvic disproportion	Height checked	yes=1, no=0
routine measurement of blood pressure	to screen for hypertension which act as an early and detectable sign of pre-eclampsia	Blood pressure is taken	yes=1, no=0
urine examination/	screen for the presence of proteinuria	Urine examination performed	yes=1, no=0
blood examination	screen for the presence of anemia	Blood examination performed	yes=1, no=0
iron supplement	Prevent/correct anemia	Received iron supplementation	yes=1, no=0
tetanus toxoid	Prevent tetanus	Received tetanus toxoid injection	yes=1, no=0
prenatal advice	Educate mothers on possible danger signs/complications of pregnancy	Told about pregnancy complications Told where to go for pregnancy complications	yes=1, no=0

NOTE: * adapted from McDonagh, 1996

Data analysis

Data analysis was conducted using STATA statistical software. Calculation of proportions was employed to estimate the prevalence of good quality prenatal care. Chi-square test was also calculated to assess the significant difference between the estimates derived from 2003 and 2008 data sets. All analyses were adjusted using weights to adjust for the sampling design. Statistical significance was set at $P < 0.05$.

V. Results

Characteristics of respondents

Prior to the estimation of prevalence of high quality prenatal care and determination of its possible correlates, the distribution of respondents was checked. Table 3 presents the frequency and proportion of respondents according to selected variables. On the other hand, the distribution of vital prenatal care contents was shown in Table 4.

Table 3. Distribution of respondents by selected variables

Variables	2003		2008	
	Frequency	%	Frequency	%
<i>Prenatal visits</i>				
without prenatal visits	285	5.81	188	3.99
with prenatal visits(at least one)	4,622	94.19	4,521	96.01
<i>Asset Quintile¹</i>				
Poorest	1,319	26.81	1,317	27.95
Poorer	1,120	22.76	1,100	23.34
Middle	931	18.92	881	18.7
Richer	833	16.93	807	17.13
Richest	717	14.57	607	12.88
<i>Type of residence</i>				
Urban	2,335	47.46	2,049	43.48
Rural	2,585	52.54	2,663	56.52
<i>Educational attainment</i>				
No formal education/primary	1,525	31	1,250	26.53
Secondary	2,053	41.73	2,200	46.69
Higher	1,342	27.28	1,262	26.78
<i>Parity</i>				
First	1,206	24.51	1,280	27.16
Second and third	1,919	39	1,844	39.13
Fourth and fifth	971	19.74	945	20.06
Sixth or last	824	16.75	643	13.65
<i>Age</i>				
15-19 years old	171	3.48	202	4.29
20-34 years old	3,407	69.25	3,244	68.85
35-49 years old	1,342	27.28	1,266	26.87
<i>Prenatal attendant</i>				
None	285	5.82	188	3.99
Doctor	1,760	35.94	1,703	36.18
Midwife/nurse	2,495	50.95	2,538	53.92
Hilot	357	7.29	278	5.91

¹ This study used the wealth index calculated by ORC Macro which was included in the DHS dataset. All household assets and utility services were included as indicator variables. For the Philippine index, household assets comprised of television, refrigerator, car, among others while utilities pertained to connection to power supply, telephone, and type of water source.

Table 4. Distribution of respondents according to content of prenatal care

Content of Prenatal Care	2003		2008		p-value
	Frequenc y	%	Frequenc y	%	
Weight measured	4,013	87.84	4,074	91.34	0.000
Height measured	2,709	59.75	2,842	65.41	0.000
Blood pressure measured	4,125	90.29	4,150	92.86	0.000
Urine sample taken	2,063	46.70	2,288	54.31	0.000
Blood Sample taken	1,665	37.65	1,945	46.62	0.000
Told about pregnancy complication	2,242	48.99	3,050	68.61	0.000
Told where to go during complication	1,985	88.52	2,918	95.66	0.000
Received tetanus Toxoid Injection	1,836	55.96	2,208	68.57	0.000
Received Iron Supplementation During Pregnancy	3,748	76.84	3,814	82.37	0.000

If p value is less than 0.05, there is a significant difference between 2003 and 2008 estimates

Prenatal care contents are dependent on prenatal care attendants. Table 5 shows that mothers who visited doctors for their prenatal care have higher probability that important contents are included while lower probability can be observed among mothers who visited a *hilot* or traditional attendant. It can be also noticed that nurses and midwives have lower probability of requesting for laboratory tests compared to doctors.

Table 5. Distribution of respondents according to content of prenatal care and prenatal attendant, (in per cent)

Content of Prenatal Care	Doctor		Nurse/midwife		Hilot	
	2003	2008	2003	2008	2003	2008
Weight measured	96.66	98.45	90.19	93.97	16.92	8.78
Height measured	71.70	77.43	56.70	62.11	12.00	5.82
Blood pressure measured	97.64	98.95	93.80	96.23	19.42	10.60
Urine sample taken	75.33	82.87	30.01	37.71	5.96	3.46
Blood Sample taken	59.75	71.08	24.93	32.39	4.23	3.35
Told about pregnancy complication	58.97	79.20	45.51	64.69	17.41	26.87
Told where to go during complication	90.87	97.41	87.06	94.42	71.62	86.12
Received Tetanus Toxoid injection	59.47	72.57	70.36	80.87	9.33	9.60
Received iron supplementation during pregnancy	85.96	91.33	81.84	86.32	28.21	17.20

Prevalence of good quality prenatal care

Table 6 shows that the proportion of mothers with no prenatal care is significantly lower in 2008 compared to 2003. This pattern is also noticeable in other categories. Conversely, good quality prenatal care is much lower in 2003 (31.79%) compared to 2008 (49.51%).

Table 6. Prevalence of good quality prenatal care

Categories	2003		2008		p- value
	Frequency	%	Frequency	%	
no prenatal care	285	5.59	188	3.84	0.000
Poor	994	19.21	666	12.53	0.000
Fair	2,112	43.42	1,664	34.12	0.000
Good	1,516	31.79	2,191	49.51	0.000

**total sample 2003: 4,907; 2008: 4,709*

If p value is less than .05, there is a significant difference between 2003 and 2008 estimates.

Table 7 shows the prevalence of quality of prenatal care by region. NCR had the highest prevalence of good quality prenatal care (74.2%) while ARMM had the lowest prevalence (16.3%). It is also interesting to note that the prevalence of good quality prenatal care is significantly higher in 2008 compared to 2003 for all regions except Central Visayas.

Table 7. Prevalence of prenatal care according to quality and region

Regions	no prenatal care			Poor			fair			Good		
	2003	2008	p value	2003	2008	p value	2003	2008	p value	2003	2008	p value
Ilocos region	6.9	6.4	0.00	22.3	13.0	0.00	46.8	41.3	0.24	24.0	39.2	0.00
Cagayan valley	6.5	2.6	0.05	17.1	11.9	0.14	47.5	35.9	0.02	28.8	49.6	0.00
Central Luzon	4.3	3.6	0.81	17.9	6.3	0.00	49.7	37.1	0.00	28.1	53.1	0.00
Bicol region	5.2	2.8	0.11	31.3	22.7	0.02	48.1	45.1	0.39	15.5	29.4	0.00
Western Visayas	5.1	3.3	0.33	13.8	8.5	0.03	46.5	32.1	0.00	34.6	56.1	0.00
Central Visayas	3.5	2.0	0.24	11.4	11.2	0.89	44.2	47.1	0.54	40.9	39.7	0.88
Eastern Visayas	3.0	5.7	0.13	37.0	18.3	0.00	43.0	33.3	0.69	17.0	42.8	0.00
Zamboanga Peninsula	11.2	4.3	0.01	25.6	16.5	0.02	47.7	45.9	0.56	15.5	33.3	0.00
Northern Mindanao	7.6	5.1	0.19	15.4	14.2	0.63	39.7	39.8	0.99	37.4	41.0	0.31
Davao Peninsula	3.4	0.8	0.04	16.0	12.2	0.32	42.1	28.7	0.00	38.5	58.3	0.00
SOCCKSARGEN	5.7	6.6	0.65	26.2	15.0	0.00	42.1	43.9	0.66	26.1	34.6	0.00
CARAGA	3.7	2.2	0.38	12.5	8.7	0.20	37.2	44.5	0.12	46.7	44.6	0.03
NCR	4.4	4.1	0.81	7.9	3.2	0.00	39.4	18.5	0.00	48.3	74.2	0.00
CAR	11.1	7.1	0.14	16.1	15.6	1.00	44.3	41.1	0.59	28.5	36.3	0.00
ARMM	4.9	4.5	0.92	56.3	54.8	0.82	24.7	24.5	0.00	14.2	16.3	0.02
CALABARZON	7.3	3.5	0.01	14.6	6.2	0.00	44.9	28.4	0.00	33.2	61.9	0.00
MIMAROPA	8.8	4.9	0.11	27.0	19.2	0.08	42.3	39.5	0.51	21.9	36.5	0.00

If p value is less than 0.05, there is a significant difference between 2003 and 2008 estimates

Prevalence of good quality of prenatal care according to different correlates

Table 8 shows the quality of prenatal care according to different socio-economic status. The highest prevalence of good prenatal care occurs in mothers belonging to the richest quintile, living in urban areas, have post-secondary education, aged 20-34 years old, and primiparous births. On the other hand, those who receive poor quality prenatal care are mothers belonging to the poorest quintile, living in rural areas, those with primary or no education, of risky pregnancy age (35-49 years old), and multiparous births. The prevalence of good quality prenatal care is significantly higher in 2008 compared to 2003 across all indicators.

The last four rows show prevalence of quality of prenatal care according to type of prenatal care attendant. Mothers who visited a doctor for their prenatal care have the highest prevalence of good prenatal care (73.2%) while mothers who visited *hilot* or traditional birth attendant have the lowest prevalence (4.2%). In addition, the prevalence of good quality prenatal care for those who visited doctor for their prenatal care is significantly higher in 2008 compared to 2003. This holds true for mothers who visited midwives or nurses. However, the prevalence of good quality prenatal care for mothers who visited *hilot* shows no significant difference.

Table 8. Prevalence of prenatal care according to quality and socio-economic status

	no prenatal care			Poor			fair			good		
	2003	2008	p-value	2003	2008	p-value	2003	2008	p-value	2003	2008	p-value
<i>Asset Quintile</i>												
Poorest	11.2	8.2	0.00	34.1	28.4	0.00	39.1	38.3	0.99	15.6	25.2	0.00
Poor	5.5	4.1	0.05	21.4	14	0.00	46.6	41.3	0.04	26.6	40.6	0.00
Middle	4.8	2.6	0.00	16.2	7.7	0.00	44.9	37.5	0.00	34.2	52.2	0.00
Richer	2.1	1.1	0.04	13	4.3	0.00	45.2	28.1	0.00	39.7	66.5	0.00
Richest	2.2	1.5	0.68	4.2	2	0.01	41.9	20.5	0.00	51.8	76	0.00
<i>Type of Residence</i>												
Urban	4.7	3.5	0.03	12.7	7.5	0.00	43.1	28.9	0.00	60.2	39.5	0.00
Rural	6.5	4.2	0.00	26	17.5	0.00	43.8	39.3	0.01	39	23.8	0.00
<i>Educational Attainment</i>												
no education/primary	12.2	9.1	0.00	30.3	26.1	0.03	41	38.9	0.4	16.6	25.9	0.00
Secondary	3.4	2.6	0.12	18.9	10.5	0.00	46.1	36.9	0.00	31.5	50	0.00
Higher	1.8	1.3	0.44	7.8	4	0.00	41.9	25	0.00	48.4	69.8	0.00
<i>Parity</i>												
First	2.9	1.8	0.07	11.9	7.4	0.00	43.6	26.8	0.00	41.6	64	0.00
second and third	4.2	2.7	0.01	16.5	10.5	0.00	45.2	33.8	0.00	34.2	53	0.00
fourth and fifth	6.3	5.6	0.72	24.2	17.2	0.00	43.7	39.1	0.02	25.8	38.1	0.00
Sixth or last	12.4	9.2	0.03	31.4	23.1	0.00	38.4	43.4	0.04	17.8	24.3	0.00
<i>Age</i>												
15-19 years old	7.5	3.7	0.03	24.1	16.7	0.035	44.7	36.1	0.37	23.7	43.5	0.00
20-34 years old	4.7	3.3	0.02	17.9	11.9	0.00	44.9	32.2	0.00	32.5	52.6	0.00
35-49 years old	7.7	5.3	0.00	21.8	13.6	0.00	39.4	38.8	0.9	31	42.4	0.00
<i>Prenatal Attendant</i>												
Doctors				8.5	2.7	0.00	40.1	24.2	0.00	51.7	73.2	0.00
Nurse/Midwife				21.1	13.2	0.00	55.2	47.2	0.00	23.7	39.7	0.00
Hilot				88.5	93	0.02	9.2	2.8	0.00	3.6	4.2	0.98

If p value is less than .05, there is a significant difference between 2003 and 2008 estimates

VI. Discussion

The importance of prenatal care to ensure better maternal and neonatal outcomes has always been emphasized in numerous studies (Barros and Tavares, 1996; Krueger and Scholl, 2000; Balcazar and Hartner, 1993; Tan, 2004; Schlaud and Kleeman, 1996; Mitchell et al 1996) and policy announcements (WHO, 2007, DOH, 2009, WHO 2009). Moreover, adequacy of prenatal visits has been associated with better behavior of mothers after birth like breastfeeding and bringing their child for immunization (Scott, Binns, and Graham, 2006; Vu, 2000).

However, despite the well-recognized importance of prenatal care, the adequacy and quality of prenatal care as they impact on selected maternal and neonatal health outcomes are poorly understood

(Alexander, 2001). The findings in this study provide a comprehensive picture of the prevalence and correlates of quality of prenatal care provided by doctors, nurses/midwives and traditional birth attendants/*hilots*. Doctors normally give all the prenatal content, nurses and midwives are falling short in providing diagnostics (i.e., having urine and blood samples taken), while *hilots* rarely provide the required prenatal care, with the exception of informing the mother where to go during complications.

The present study determined the prevalence and correlates of good prenatal care in the Philippines comparing the data from NDHS 2003 and 2008, where a significant increase in the quantity of prenatal care was noted. Moreover, there was significant improvement in the content of prenatal services provided to the respondents as well as increase in the prevalence of quality of prenatal care. The improvement in the prevalence of good prenatal care is observed in all regions except in Central Visayas. However, low prevalence of good quality of prenatal care was noted among women who are poor, with low education, living in rural areas, are multiparous, and of extreme ages.

The significant increase in the prevalence of good quality prenatal care in the Philippines from 32% in 2003 to 50% in 2008 is a function of different factors. The effectiveness of different programs that improves maternal and infant health institutionalized by both the public and the private sectors were vital contributors on the significant improvement. However, the significant increase in the prevalence of good prenatal care can be best explained by delving into the prenatal care practices among the different prenatal care attendants. As noted in the results, significant increase on the prevalence of good prenatal care from 2003 to 2008 (52% to 73%) was observed among mothers who visited a physician for their prenatal care. It can be reasoned out that physicians are more equipped with proper knowledge in terms of prenatal care management. In addition, physicians have better access to continuing education that would enable them to improve their current clinical practices. On the other hand, increase in the prevalence of good prenatal care was also observed among mothers who visited nurses or midwives for their prenatal care. However, most of these mothers have not received optimal prenatal care quality as manifested by the high prevalence of fair quality prenatal care. This can be explained by the fact that some of the contents of prenatal care which is essential in determining quality are not performed (e.g. laboratory services). Lastly, low prevalence of good quality prenatal care was observed among mothers who attended traditional birth attendants for their prenatal care. This is expected since *hilots* do not have scientific knowledge and training in addressing the needs of the mothers (Ballweg and Pagtulonan, 1996). This was further ascertained by the study that no improvement was observed in the practices of *hilots* as manifested by the lack of significant difference on the prevalence of good prenatal care in 2003 and 2008.

The findings of the study support the shift in the policy of the Department of Health (DOH) regarding the participation of traditional birth attendants in the maternal and infant health delivery. In the earlier years, the training of births attendants in prenatal care and delivery was institutionalized to address the deficiency of skilled professionals to attend maternal and child health services especially in the rural areas.² The persistent low quality prenatal care made by *hilots* solidifies the evidence that adaption of “no traditional birth attendant policy” should be mandated by the local government units.

While the prevalence of good prenatal care has improved between 2003 and 2008, pregnant women still receive incomplete or poor quality of care, especially those women who are poor, less educated, multiparous, living in rural areas, and of extreme ages (either very young or very old). These characteristics are related to lack or poor knowledge about the health care system, and poor access to professional health care providers due to financial and geographic limitations (Wagstaff, 2002; Asch and Kerr, 2006).

² Department Circular No 69-A s 1994, dated April 22, 1994

VII. Strengths and Limitations of the study

This study has several strengths. The data set provides national sample with excellent representation of all mothers in the Philippines. In addition, NDHS was implemented with strict adherence to standards set by Macro International. The use of several survey procedures like pre-testing and translation of survey into local dialects minimizes the possible occurrence of biases. Rigorous training of interviewers was performed before deployment to fieldwork and double entry of data was done during data processing to ensure a more accurate dataset. Thus, the quality of data is guaranteed.

However, like many other studies, this study has some limitations. This study did not look at the relative importance of individual content of prenatal care on maternal and neonatal outcomes such as measuring of height of the mother versus providing tetanus toxoid vaccination. In addition, this study did not investigate the possible role of quality of prenatal care on health outcomes like birth weight.

VIII. Recommendations

There are several policy recommendations that arise from the results of this study. Firstly, the content and quality of care are important to achieve better maternal and neonatal health outcomes. With the direction of health service delivery reforms to increase the capacity of the nurses and midwives to provide adequate maternal and child health care at the Barangay Health Station and Rural Health Units, it is important to identify which components of prenatal care they do not regularly provide. Thus, building the capability of midwives and nurses along these components is important.

Secondly, the cultural role of *hilots* or traditional birth attendants notwithstanding, they cannot provide quality prenatal care that mothers require. The “no traditional birth attendant” policy of the Department of Health should be further emphasized. Currently, 6% of mothers received their prenatal care from TBAs. However, when it comes to child birth, a significant portion of mothers ended up giving birth in homes attended by TBA. Directing mothers to seek skilled birth attendant for the prenatal care and delivery requires an integrated effort within a network of service delivery providers with vital participation of the local government units (LGUs). Instead of disenfranchising the *hilots* from the system by disallowing them to assist women in delivery, the DOH and the LGUs can encourage and incentivize them to become agents in ensuring that pregnant mothers seek prenatal care from skilled professionals and deliver in well-equipped health facilities.

Thirdly, the result underscores the disparities in utilizing quality prenatal care. It is imperative therefore that vulnerable mothers (i.e. those who are poor, with low education, living in rural areas, are multiparous, and of extreme ages) are targeted and that the financial and geographic barriers that prevent them to access quality prenatal care be removed. These measures can range from demand side interventions such as conditional cash transfers for seeking prenatal care and access to social health insurance, to supply side interventions such as deploying adequate health human resource to rural areas and establishing health facilities that are accredited by PhilHealth. Lastly, there is a need to measure and track the quality of prenatal care that mothers get. Using the methodology used in this study can provide the health managers to track the prevalence of the quality of prenatal care being provided to their clients.

Further studies are also needed to understand the impact of the quality of care on infant and maternal outcomes. These includes looking at the possible association between quality prenatal care and health outcome like birth weight and utilizing Factor Analysis or Principal Component Analysis to come up with a more defined scoring system.

IX. References

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