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## Are Maternal and Child Care Programs Reaching the Poorest Regions in the Philippines?

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Philippine Institute for Development Studies  
*Surian sa mga Pag-aaral Pangkaunlaran ng Pilipinas*

## Are Maternal and Child Care Programs Reaching the Poorest Regions in the Philippines?

*Rouselle F. Lavado and Leizel P. Lagrada*

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**ARE MATERNAL AND CHILD CARE PROGRAMS REACHING THE POOREST REGIONS IN THE PHILIPPINES?**

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## **ABSTRACT**

While the national average for maternal and child health services utilization shows improvement, the Philippines is yet to achieve the MDG targets for maternal and child health. This study shows inequality in maternal and child health services utilization across economic classes and across regions. Moreover, based on regional Gini coefficient, there are various patterns of utilization and concentration of services across living standards. Interventions to increase the uptake of maternal and child health services based on these patterns are recommended.

Keywords: maternal and child care, utilization, access, inequality

JEL Classification: H41, I10

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## **ARE MATERNAL AND CHILD CARE PROGRAMS REACHING THE POOREST REGIONS IN THE PHILIPPINES?**

*Rouselle F. Lavado and Leizel P. Lagrada*

### **I. Introduction**

Deaths due to pregnancy and childbirth still persist, with more than 99 percent of annual maternal deaths occurring in developing countries.[1] Effective interventions to reduce the risk of maternal mortality have been identified [2] yet about half million of women continue to die annually due to complications of pregnancy and childbirth. Except in few countries, improvements in curbing maternal deaths over the last 15 years were slow and patchy. [3] Unequal access to health care still remains as one of the major barriers of reducing maternal deaths as there are still huge differences in health status among population groups, particularly based on income classes and geographic areas.

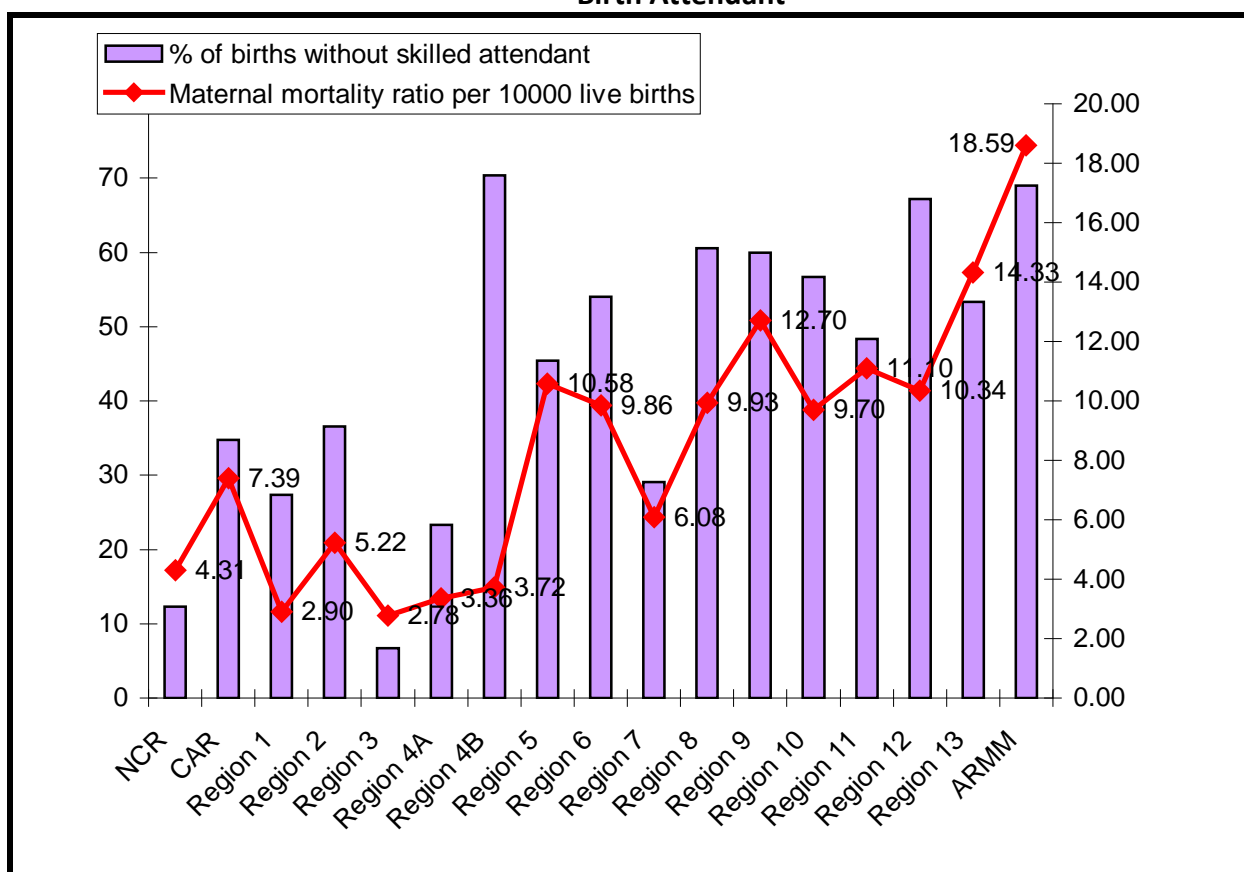
Consistent with its constitutional mandate of making essential goods, health and other social services available to all the people at affordable cost, giving priority to the needs of the underprivileged, sick, elderly, disabled, women and children, the Philippine government has committed to achieve the Millennium Development Goals (MDGs) by 2015. This commitment includes, among others, reducing the under-5 mortality rate by two-thirds and reducing the maternal mortality ratio by three-fourths. The health goals and the strategies to reach these targets are further reiterated in the Medium Term Philippine Development Plan 2004-2010 and the National Objectives for Health 2005-2010.

Despite the government's efforts, however, the reduction of maternal deaths has gradually declined from an estimated 209 per 100,000 live births in 1987-1993 to 172 per 100,000 live births in 1998 while the under-five mortality rate has declined from 52 per 1000 live births in 1993 to 40 in 2004.[4] Moreover, reports show that under-5 mortality and maternal mortality rates by province show large differentials. As example, in both 1990 and 1995, the infant and maternal mortality rates of top five high mortality provinces are as twice as high as the five lowest mortality provinces.[5] In addition, the child mortality rate among children 2-4 years old per 1,000 live births in NCR was 7 while Autonomous Region of Muslim Mindanao (ARMM) was 30. Maternal mortality rate ranges from 119 in NCR and in ARMM 320. With these figures, it is not surprising that the projected life expectancy of females in 2005 was 73.69 in NCR and 61.82 in ARMM while males in NCR outlived women by about 12 years longer than those in ARMM, with 69.17 years as opposed to only 57.99 in the latter.

The Department of Health (DOH) has identified geographic factors, misdistribution of health facilities and health professionals as well as individual behavior and household socioeconomic factors as barriers to access to health services. To address these barriers, the Maternal and Child Health Program has taken innovative strategies in recent years. To ensure healthy newborns, the DOH has adopted the Safe Motherhood Initiative in 1988 with the basic premise that "childbirth must not carry with it the risk of death or disability for the

woman and her infant.” [4] The DOH recommends that all pregnant women have at least four antenatal visits during each pregnancy. It further recommends that the first antenatal checkup should occur in the first trimester of the pregnancy to detect complications early. It is also essential that women had iron or folate supplementation to prevent anemia. [7] Delivery itself should be conducted in health facilities or birthing centers with a skilled professional birth attendant. However, as Figure 1 shows, maternal mortality is still related to the absence of a skilled birth attendant. Most of the deaths and complications due to pregnancy could have been avoided since medical solutions for these problems are known. There appears to be a problem of strategy and organization in delivering maternal health programs. [8]

**Figure 1. Relationship between Maternal Mortality Rate and the Absence of Skilled Birth Attendant**



**SOURCES:** Field Health Service Information System, Annual Report 2002 and authors' calculations based on the 2003 National Demographic and Health Survey

**NOTE:** Maternal mortality ratio per 10,000 live births was computed from the number of maternal deaths reported at Field Health Service Information System of the Department of Health. The number is based on actual deaths reported and is likely to be underreported.

The Expanded Program on Immunization, another pillar health program of the DOH, aims to protect children against preventable diseases such as tuberculosis, polio, diphtheria, pertussis, tetanus, and measles. A child is considered to have complete immunization when he/she has received three dosages of diphtheria, pertussis, tetanus (DPT) vaccine and oral polio vaccine, as well as one dose each of measles and Bacillus Calmette-Guerin (BCG)

vaccines. This program brought about improvements in prevention and control of vaccine-preventable diseases among infants and children in the past but the vulnerability of non-immunized population increases with a drop in the proportion of fully-immunized children from 90% in 1997 to 69.8% in 2003.[4]

Considering that the Philippines is a signatory to achieve the Millennium Development Goals by 2015, it is important to know if the critical health programs are reaching the intended population. This paper assesses the maternal and child health programs in the Philippines by demonstrating the inequality in access to maternal and child health services across economic classes and regions. In addition, this paper also identifies patterns of inequalities among regions based on their economic characteristics.

## **II. Methodology**

### ***a. Data***

The 2003 National Demographic and Health Survey was a national representative survey conducted to calculate demographic indicators, particularly pertaining to maternal and child health and fertility practices. Between June to September 2003, households were interviewed regarding their knowledge and attitudes towards health.

The sampling of households for the 2003 NDHS used a master sample based on the 2000 Census of Population and Housing. In each of the 17 regions in the Philippines, a stratified, three-stage cluster sampling design was used. The first stage selected 819 primary sampling units in the smallest political subdivision of the country, the *barangay*. The probability of selection in this stage is proportional to the number of households based on the 2000 Census. The second stage identified enumeration areas in each primary sampling unit. An enumeration area consists of about 150 neighboring households. In the last stage, about 17 households were selected in each of the enumeration areas. [9]

The household questionnaire was given to every household identified in the sampling. The questionnaire collected information on household residents, age, and educational attainment as well as the characteristics of the dwelling unit and household assets. The household questionnaire was employed to identify eligible individuals for the interview. The women's individual questionnaire collected information on educational background, reproductive history, knowledge and usage of family planning methods, prenatal, delivery, and postnatal care, vaccinations and childhood illnesses of children under 5, among others.

For the analysis of maternal health, a subsample of 1,529 women who gave birth a year prior to the survey was used. The information based on women with children 1-5 years old was utilized for child immunization. The survey composition is presented in Table 1.



**Table 1. Demographic and Health Survey Composition**

	<b>Number</b>
<b>Total Number of Household</b>	12,586
<i>Of which</i>	
Individual Members of Households	61,864
<i>Of which</i>	
Women Interviewed	13,633
<i>Of which</i>	
Children of women interviewed who are 1-5 years old	3,401
Children who are fully immunized	2,448
Pregnant a year prior to the survey	1,529
<i>Of which</i>	
Have complete information on adequate number of visit	1,515
Have complete information on timing of first antenatal visit	1,427
Have complete information on intake	1,526
Have complete information on assistance by health professional	1,526
Have complete information on delivery in medical facilities	1,526

The indicators used to evaluate maternal and child health services are based on the recommendations of the Department of Health. For the purposes of this study, maternal care is divided into antenatal care and delivery care. Antenatal care is assessed using indicators such as timing of the first prenatal check-up (anytime during the first three months of pregnancy), the number of prenatal visits of a pregnant woman (at least 4 prenatal visits), and iron supplementation. Delivery care is assessed using skilled birth attendance and deliveries done in a health facility. Child health care is evaluated by using the indicator fully immunized child.

#### ***b. Method of Analysis***

The methodology employed attempted to derive the distribution of service utilization across population classified in terms of wealth. Since no data on income, expenditure or consumption could be obtained from the dataset, wealth was measured in terms of assets that the household possessed. Asset index scores adopted were included in the dataset obtained using the technique proposed by Filmer and Pritchett (2001) and Gwatkin et al. (2000).[10] The asset index scores were then expressed in quintiles.

Both coverage and concentration of services were derived for each program. Health service utilization coverage was calculated for the whole subsample per asset quintile and region. The degree of inequality was measured using concentration curves and indices.

### ***i. Derivation of Wealth Index***

A household's economic status can be ascertained by measuring household income, household consumption, or household wealth. Based on economic theories, household income is the best indicator among the three. Due to difficulties in data collection, however, income is rarely included in health surveys such as the DHS. Measuring household income is also fraught with difficulties particularly for developing countries because most people do not know their exact income or some try to hide their real incomes from interviewers. Household expenditure is a good alternative but it is also laden with difficulties.

According to Rutstein and Johnson [11], a common problem of measuring household income and expenditure in developing countries is their volatility arising from seasonality and randomness. Households tend to adjust discretionary expenditure while maintaining necessities such as food, clothing and shelter. Since most expenditure for preventive health is usually considered discretionary expenditures, they are more a factor of household permanent income rather than current income or expenditure. Household wealth can represent permanent income better than the other two measures, it is therefore more reasonable to look at the relationship between health utilization and household wealth.

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, and car, among others while utilities pertained to connection to power supply and telephone, and type of water source.

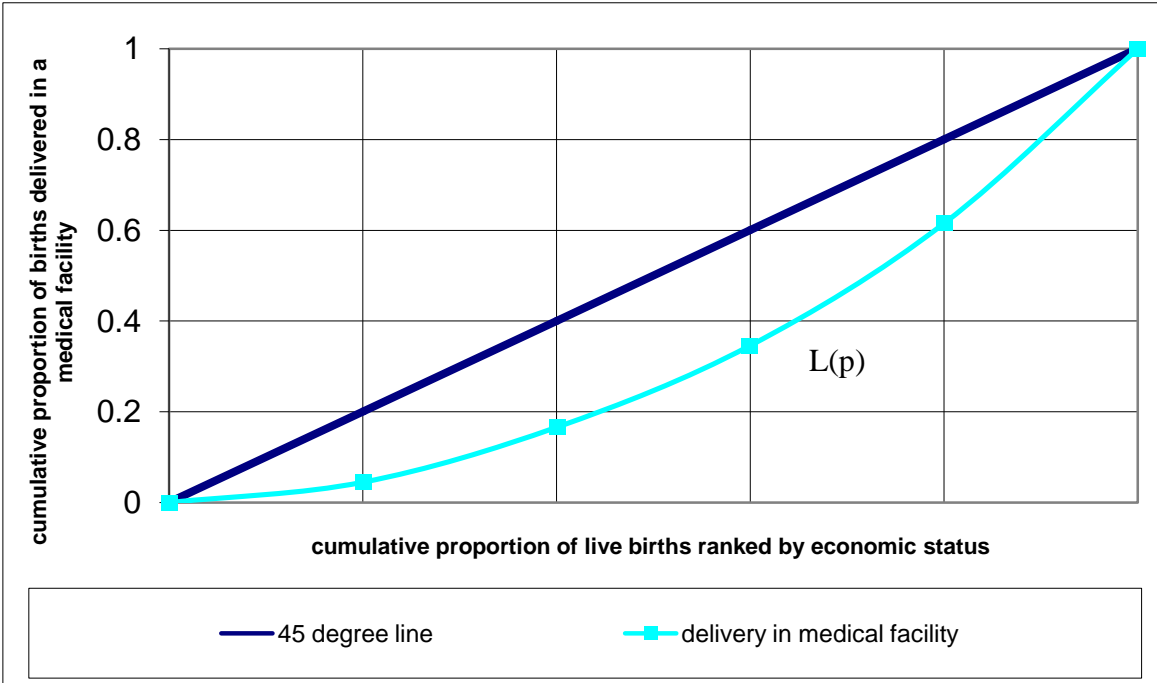
In assigning weighing values for indicator variables, ORC Macro used principal components analysis as suggested by Filmer and Pritchett [12]. This procedure first calculates the z values for each asset and utility then calculates factor loadings for each indicator. Household assets and utilities (taking zero and one) are multiplied by the factor loading score and are added to come up with the household wealth index. The households are then ranked according to their wealth quintile.

### ***ii. Concentration Curve and Concentration Index***

A concentration curve is similar to a Lorenz curve in that it depicts the degree of inequality in a specific health variable. The concentration curve below illustrates income-related inequality in health utilization. The x-axis graphs the cumulative percent of births, ranked according to wealth index while the y-axis plots the cumulative percent of those utilizing the health service according to each cumulative wealth quintile. The closer a curve is to the 45-degree-line, the more equal the access to a particular health service. If the poorer people have higher utilization than others, the concentration curve will lie above the

45-degree-line. In contrast, when the poorer people have lower utilization of service compared to others, the concentration curve will lie below the line of equality and the farther it is to the line, the more concentrated the service is towards the richer people in the sample. For illustration purposes, the concentration curve for live births delivered in a medical facility is shown in Figure 2.

**Figure 2. Concentration Curve for Deliveries in Medical Facilities**



**SOURCE:** Authors' calculations based on the 2003 National Demographic and Health Survey

Accompanying concentration curves are the concentration index which, similar to the Gini coefficient, is defined as twice the area between the concentration curve,  $L(p)$  and the 45-degree-line. The higher the value, the higher the inequality among the quintiles while a value of zero means that there is no wealth-related inequality. Based on the World Bank guide on quantitative techniques for health equity analysis, the concentration index,  $C$ , is computed using the formula,

$$C = (p_1L_2 - p_2L_1) + (p_2L_3 - p_3L_2) + \dots + (p_{T-1}L_T - p_TL_{T-1}),$$

where  $p$  is the cumulative percent of the sample ranked by economic status,  $L(p)$  is the corresponding concentration curve ordinate, and  $T$  is the number of socioeconomic groups. Statistical inference to test the significance of the indices is computed based on the formula derived by Kakwani et al.[13]. Since micro-level data is available, it would have been possible to compute the concentration indices based on individual-level. However, the approach adopted in this study was to aggregate individual level data in asset quintile groups. Current approaches to compute standard errors for micro-data have yet to allow weighted data.

Since the weights are crucial to have a national representative sample in the NDHS data, individual data were aggregated and standard errors were computed based on the group data.

In summary, the following steps were undertaken in this paper: first, women who were pregnant a year prior to the survey and women with child five years old and below were identified. Second, asset scores were calculated for each household where the woman belongs. Based on the asset scores, each household was ranked into quintiles. Third, patterns of utilization were analyzed depending on the woman's level of welfare and region. Fourth, concentration curves were plotted to show the cumulative distribution of health service utilization based on asset wealth. Fifth, concentration indices were computed to discern the extent of inequality. Moreover, welfare dominance tests were conducted to test for statistically significant differences. Lastly, further analyses based on other data were conducted to trace the sources of inequality in access to public health programs.

### ***c. Categorizing Regions based on Gini Coefficient***

Regions were categorized based on Gini coefficients that were calculated using the estimates from the Family Income and Expenditure Survey 2000 to identify the patterns of MCH services utilization among regions. In this study, regions are categorized as either having low (<0.40) or high (>0.45) Gini coefficient.

## **III. UTILIZATION OF MATERNAL AND CHILD HEALTH SERVICES**

Antenatal care is necessary to identify women who are at risk of having pregnancy complications. To accomplish this, it is important that a pregnant woman's first antenatal check-up occur during the first trimester as this period presents the most risk for her. Of all women who were pregnant one year before the survey, only 51 percent had antenatal check-ups during the first three months of pregnancy. It is also recommended that at least four antenatal check-ups be undertaken by the mother during the duration of pregnancy. A considerable percentage of women comply with this recommendation, with 67 percent of the sample going to doctors four or more times. Iron supplementation is more favorable than the two other indicators with 78 percent of the sample taking iron during pregnancy.

The presence of professional care during delivery, with proper equipment, drugs and supplies to handle complications, is a major factor on the survival of the mother and the newborn during delivery. Sixty-two percent of births a year before the survey were assisted by health professionals such as doctors, midwives, and nurses. This figure did not meet the target set by the Department of Health of 80 percent by 2004. Only 40 percent of births were delivered in health facilities such as government hospitals, government health centers or private hospitals and clinics. Most deliveries were conducted at home.

The NDHS survey collected immunization information for children born 5 years before the survey based on vaccination cards and mother's oral report. Seventy-three

percent of children 1-5 years old received three dosages of DPT and oral polio vaccines and one dose each of measles and BCG vaccines based on either mother's recall or vaccination cards.<sup>1</sup>

Utilization of maternal and child health programs vary by region (Table 2). Within regions, it differs depending on the level of urbanization or proximity to urban areas. Coverage tends to be higher in Luzon particularly Metro Manila and regions surrounding Manila such as Regions 3 and 4A. Only areas in the northern and southernmost parts of Luzon, the Cordillera Administrative Region, Regions 5 and 4B, have very low coverage.

Of the three regions in the Visayas, only Region 7 where Cebu, the second largest city is located, exceeds the national average in almost all indicators. With the exception of the ARMM, utilization of antenatal programs in most regions in Mindanao exceeds or is very close to the national average. The same cannot be said, however, for skilled birth attendance where all the regions fall below average on births attended by health professionals. For births in a medical facility, only Region 11 exceeds the national average. Region 11 is where Davao City is, the third largest city in the Philippines. In all indicators, the region with the lowest coverage is the Autonomous Region of Muslim Mindanao.

**Table 2. Antenatal, Delivery Care and Immunization Utilization, per Region**

Regions	Check-up during first trimester	At least 4 Antenatal Visits	Iron Supplementation	Births with Skilled Attendant	Births in a Medical Facility	Children Fully Immunized
NCR	<b>64.58</b>	<b>81.44</b>	78.82	87.68	<b>73.89</b>	<b>81.19</b>
CAR	47.62	54.17	62.5	65.22	52.17	72.73
Region 1	53.85	61.64	80.82	72.6	27.4	76.06
Region 2	63.04	58.82	68.52	63.46	33.33	75.83
Region 3	59.38	74.24	82.09	<b>93.33</b>	47.01	75.80
Region 4A	61.76	72.07	77.78	76.67	46.67	73.56
Region 4B	46.94	67.92	80	29.63	18.52	68.32
Region 5	27.17	54	73.27	54.55	28	61.98
Region 6	44.79	66.67	85.29	46	33.33	78.54
Region 7	43.86	73.73	<b>90.6</b>	70.94	47.01	73.98
Region 8	28.17	56.58	72	39.47	19.23	70.25
Region 9	58.82	62.07	72.41	40	20.34	60.28
Region 10	45.16	55.22	76.47	43.28	32.84	67.79
Region 11	51.67	68.75	78.13	51.61	46.77	68.18
Region 12	55.38	70.42	71.83	32.86	21.43	74.51
Region 13	46.51	76.74	84.78	46.67	29.55	76.53
ARMM	<b>28.57</b>	<b>43.1</b>	<b>55.17</b>	<b>31.03</b>	<b>15.52</b>	<b>51.67</b>
National Average	48.66	64.56	75.91	55.59	34.88	72.81

**SOURCE:** Authors' calculations based on the 2003 National Demographic and Health Survey

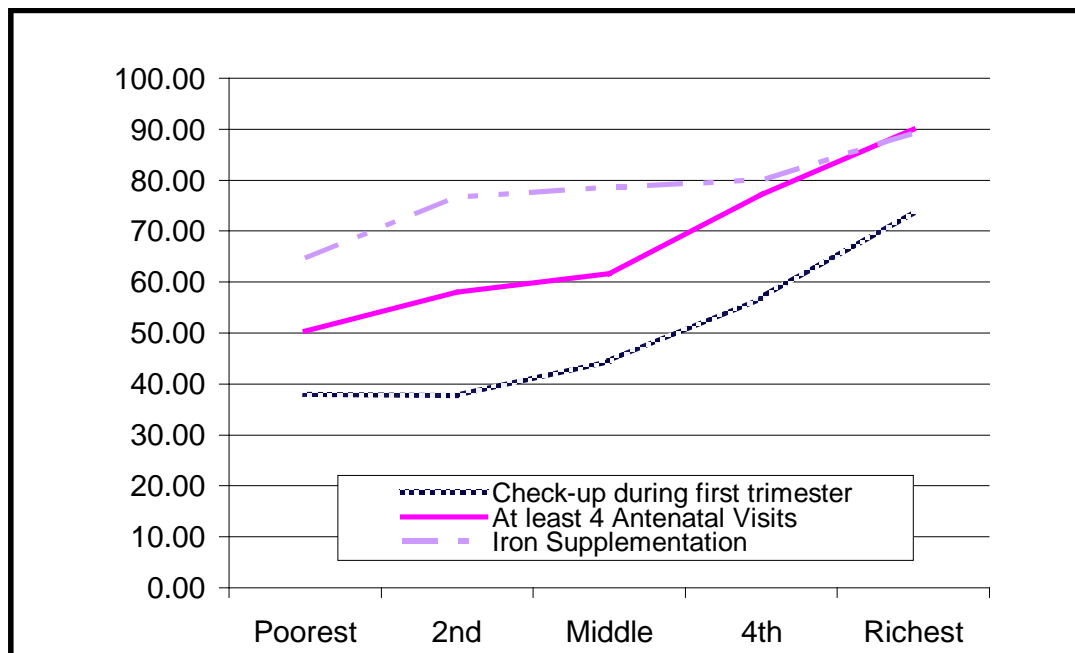
<sup>1</sup> If the sample for child immunization is to be based on vaccination cards, only 26 percent of the children will have complete immunization records.

#### IV. INEQUALITIES IN UTILIZATION OF MCH SERVICES

##### a. Inequalities in Prenatal Care, Delivery Care and Immunization

As Figure 3 shows, inequality in utilization is evident across asset quintiles. Those in the richest quintile are two times more likely than those in the poorest and 2<sup>nd</sup> quintile to have a prenatal check-up. Similarly, pregnant women who have at least four antenatal check-ups during the duration of pregnancy vary depending on asset quintiles—90 percent of the richest having adequate number of check-ups while only 50 percent of those in the poorest quintile does. Inequality is also less among the wealth quintiles. Among the three antenatal indicators, iron supplementation has the flattest curve indicating relatively equal access between the rich and the poor.

**Figure 3. Inequalities in Antenatal Care Access**



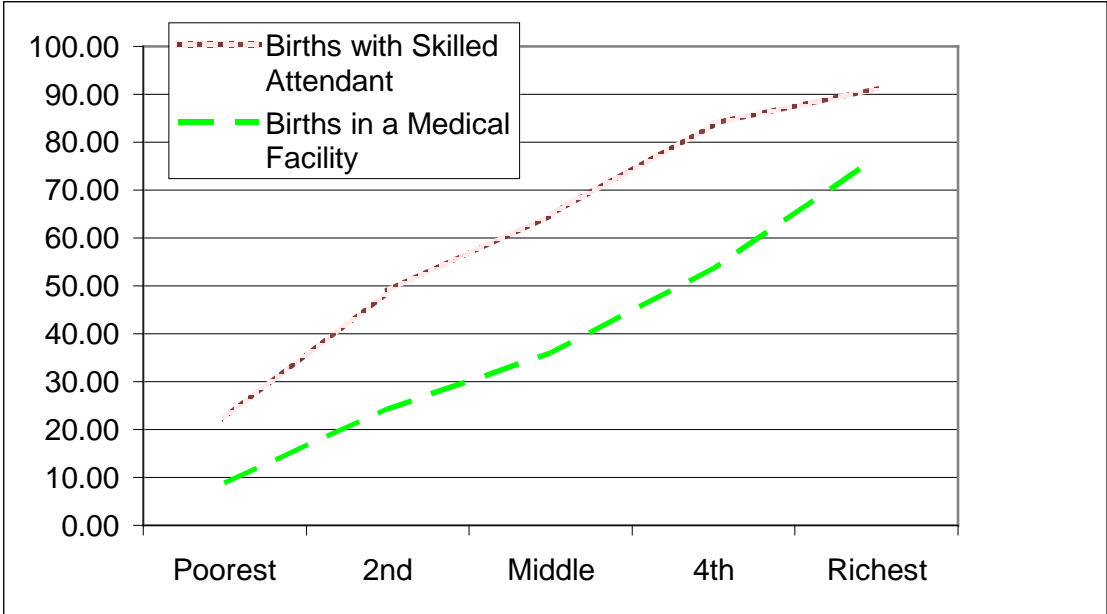
**SOURCE:** Authors' calculations based on the 2003 National Demographic and Health Survey.

The differences of women who were assisted by skilled attendants during delivery were also very stark across wealth quintiles. Those in the richest quintile were five times more likely than the poorest to have births attended by a health professional (Figure 4). Moreover, mothers who delivered in health facilities differ across wealth quintiles. While 77 percent of the richest quintile can deliver their babies in a health facility, only 9 percent of the poorest can afford to do so.

As Figures 3 and 4 show, utilization of delivery care services was steeper compared to antenatal care utilization. Since most antenatal care programs are available for free or for a minimal fee at government health centers, the cost barrier is removed even for those at the poorest quintile. Deliveries, however, are not provided free of charge even at health centers,

leaving the poor with no other choice but the cheaper alternative of having it at home, assisted by a traditional health worker or *hilot*.

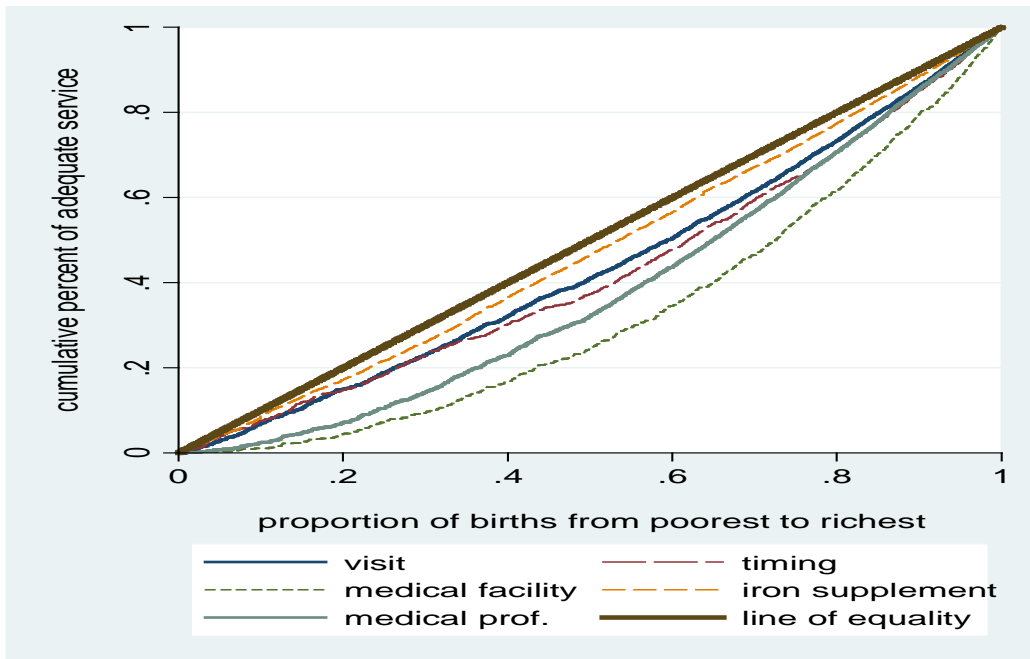
**Figure 4. Inequalities in Delivery Care Utilization**



**SOURCE:** Authors' calculations based on the 2003 National Demographic and Health Survey

To formalize the definition of inequality between quintiles, concentration curves for these five indicators are presented in Figure 5. Similar to the results obtained above, the service with most unequal utilization is delivery in a health facility followed by births with professional assistance. Iron supplement intake is the least unequal among these maternal care services. From the figure, it can be seen that the poorest 40 percent of all mothers who gave birth comprise 37 percent of all mothers who took iron supplements during pregnancy. In terms of antenatal checkups, the poorest 40 percent account for 32 percent of those with four or more antenatal check-ups and 30 percent of those who went to doctors during their first trimester. Utilization of the poor drops tremendously for delivery care services. Among the poorest 40 percent of mothers, only 23 percent of births had their deliveries assisted by a medical professional and only 17 percent had their deliveries in a medical facility.

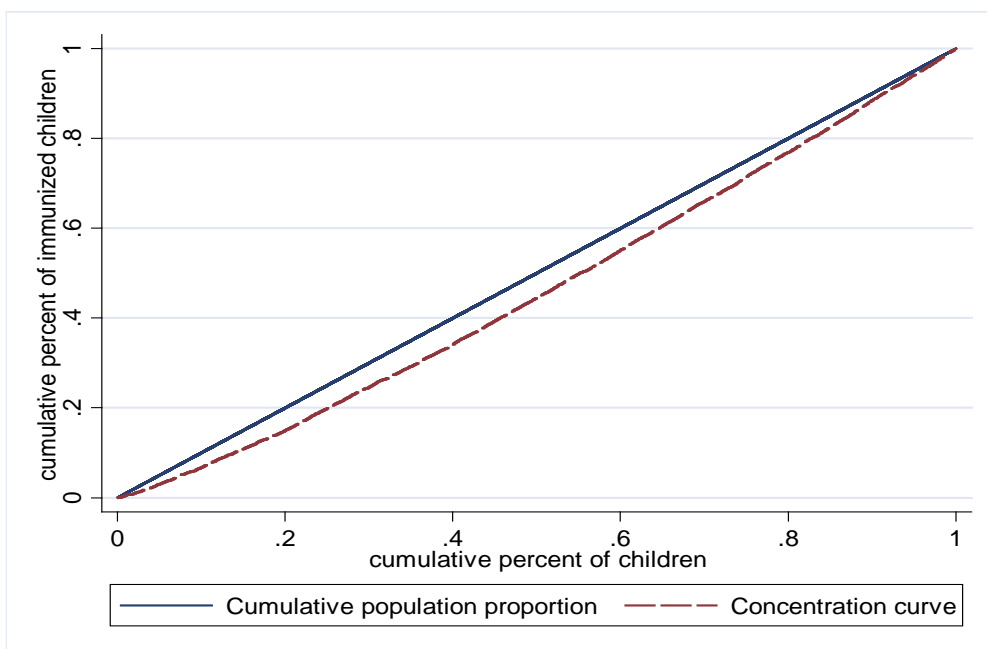
**Figure 5. Concentration Curve for Maternal Health Service Utilization**



**SOURCE:** Authors' calculations based on the 2003 National Demographic and Health Survey

Compared to indicators of maternal delivery, utilization of immunization services is not very unequal as shown in Figure 6. However, since vaccination is offered for free at health centers, it is alarming that immunization coverage still varies with wealth status. While 84 percent of children whose households belong to the richest quintile are immunized, only 57 percent of children belonging to the poorest quintile are. This might suggest that despite the subsidy, there remains some gap in the delivery of immunization services.

**Figure 6. Concentration Curve for Child Immunization**



**SOURCE:** Authors' calculations based on the 2003 National Demographic and Health Survey



### **b. Patterns of Regional Inequalities**

It is not surprising that the regions with the lowest level of coverage, the Autonomous Region of Muslim Mindanao and the Bicol Region, are also the poorest regions in the Philippines. Poverty incidence computed based on the Family Income and Expenditure Survey shows that 53 percent of the families in the Autonomous Region of Muslim Mindanao have per capita incomes below the poverty threshold. The richest regions are the National Capital Region, Regions 3 and 4A in Luzon, Region 7 in Visayas and Region 11 in Mindanao.

According to the Medium Term Philippine Development Plan 2004-2010, “it has been observed that regions with the highest poverty incidence do not necessarily have high level of inequality.” Table 3 shows that the Autonomous Region of Muslim Mindanao which posted the highest poverty incidence in the country, has the lowest level of income inequality. Gini coefficients presented are based on income estimates from the Family Income and Expenditure Survey in 2000. Low Gini coefficients, however, do not necessarily translate into low regional concentration indices as well.

Five patterns of relationship between Gini coefficients and concentration indices can be deduced based on Table 3. First, regions with highly urbanized cities, such as Regions 11, 7 and the National Capital Region (NCR), have high Gini coefficients, high utilization rates, and relatively high concentration indices. Second, there are richer regions with low Gini coefficients and low concentration indices like Regions 3 and 4A. Third, Region 5 is a poor region with both high income inequality and health concentration indices. Fourth, the Autonomous Region of Muslim Mindanao has a low level of income inequality but very high level of disparity in public health utilization. And last, the remaining regions have high Gini coefficients but low levels of concentration indices for antenatal care and high levels for delivery care.

**Table 3. Gini Coefficients and Concentration Index for Maternal and Child Health Services**

Region	Poverty Incidence	Gini Coefficient	Check-up during First Trimester	At least 4 Antenatal Visits	Iron Supplementation	Births with Skilled Attendant	Births in a Medical Facility	Full Immunization
NCR	7.3	0.45	0.15	0.11	0.07	0.08	0.14	0.04
CAR	31.2	0.45	0.14	0.25	0.22	0.28	0.43	0.11
Region 1	30.2	0.41	0.19	0.14	0.05	0.15	0.41	0.05
Region 2	24.5	0.42	0.06	0.12	0.06	0.15	0.26	0.05
Region 3	17.7	0.36	0.1	0.09	0.04	0.03	0.23	0.06
Region 4A	18.8	0.39	0.14	0.1	0.04	0.07	0.18	0.05
Region 4B	47.9	0.4	-0.01	0.07	0.08	0.52	0.62	0.05
Region 5	48.4	0.45	0.26	0.14	0.07	0.18	0.38	0.13
Region 6	39.1	0.46	0.16	0.14	0.02	0.28	0.37	0.02
Region 7	28.4	0.47	0.1	0.11	0	0.12	0.31	0.09
Region 8	43.3	0.48	0.26	0.06	0.01	0.34	0.5	0.14
Region 9	49.4	0.46	-0.05	0.16	0.04	0.24	0.26	0.15
Region 10	44.3	0.47	0.06	0.1	0.11	0.21	0.26	0.10
Region 11	34.4	0.46	0.12	0.12	0.05	0.3	0.32	0.10
Region 12	38.4	0.44	0.04	0.08	0.1	0.38	0.49	0.08
Region 13	54.2	0.41	0.06	0.12	0.07	0.4	0.51	0.11
ARMM	53.1	0.34	0.17	0.16	0.14	0.32	0.59	0.08
National	30.4	0.48	0.15	0.12	0.05	0.22	0.33	0.07

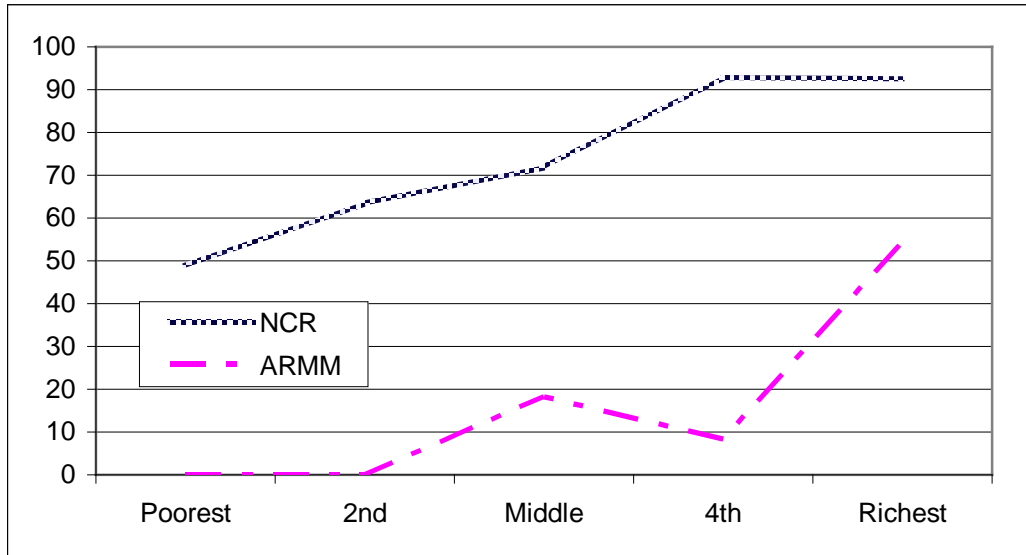
**SOURCE:** National Statistical Coordination Board and 2003 National Demographic and Health Survey

**NOTES:** Gini Coefficients are from the National Statistical Coordination Board and concentration indices are authors' calculations based on the 2003 National Demographic and Health Survey.

Provinces in Regions 3 and 4A are in close proximity to Metro Manila. Due to the high prices of land however, many people who work in Manila opt to reside in the adjoining provinces of Regions 3 and 4A. Most export processing zones are also located in the two regions. These characteristics probably explain why the two regions exhibit low poverty incidence as well as low levels of income inequality. Utilization level of maternal and child health services are also less unequal compared to other regions.

Region 5 and the ARMM are the two poorest regions in the Philippines yet both exhibit very different patterns of utilization of maternal and child health services. Figure 7 clearly illustrates the different patterns of exclusion in births delivered at health facilities for NCR and ARMM. The ARMM suffers from low levels of coverage with only the rich quintile substantially utilizing the health services. As explained earlier, although there are high levels of service utilization at the NCR, the poorest residents remain marginalized.

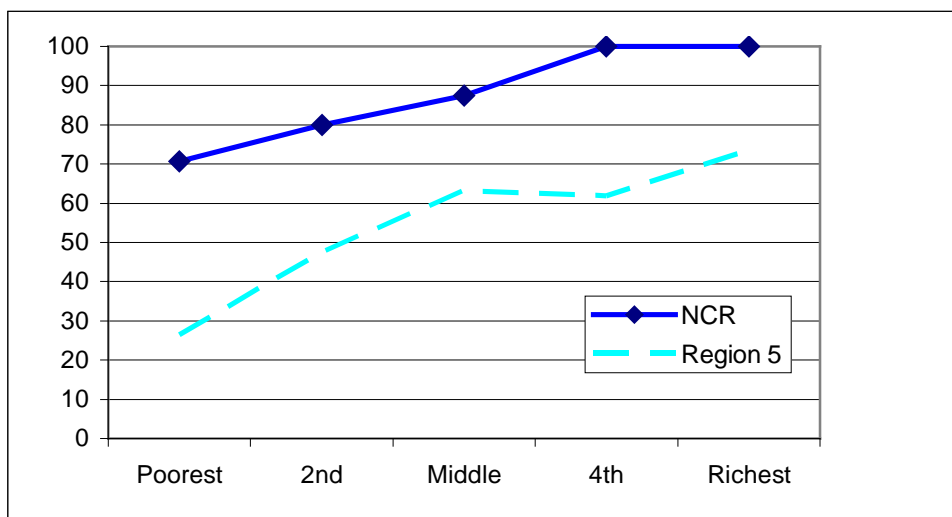
**Figure 7. Difference in the Pattern of Exclusion in the National Capital Region and Autonomous Region of Muslim Mindanao for Births in Health Facilities**



**SOURCE:** Authors' calculations based on the 2003 National Demographic and Health Survey

This is in contrast with Region 5 which is not only poor but also one of the most unequal, and has exclusion pattern similar to that of NCR (Figure 8). Patterns of inequality have implications to the uptake of health services in the area. In the case of the ARMM, health facilities and personnel are very limited. Majority of the people are also poor so that even those in the middle or fourth quintile may not be able to afford delivery in a health facility, even if it were accessible. In the case of Region 5, facilities and personnel may be adequate, but only those who are rich enough are able to avail it.

**Figure 8. Difference in the Pattern of Exclusion in Metro Manila and the Bicol Region for Births Assisted by Medical Professional**



**SOURCE:** Authors' calculations based on the 2003 National Demographic and Health Survey

## V. Discussion and Policy Implications

Addressing inequalities in MCH services utilization from the standpoint of policy is of utmost importance. As this paper provides another evidence for inequalities in MCH services utilization, various barriers that prevent an individual from utilizing health services must be identified. These barriers could range from individual's health knowledge and financial capacity to availability of health facilities, personnel and services in the area. Based on the above findings, Table 4 summarizes the possible policies or strategies that should be in place or strengthened to reduce the inequalities in MCH services utilization.

**Table 4. Patterns of Gini coefficient, Utilization and Concentration Index and Potential Policy Focus**

Gini-Utilization-CI	Region	Potential Policy Focus
High-High-High	NCR, Region11, Region 7	<ul style="list-style-type: none"> <li>➤ Expand health insurance to cover the poor particularly households in 1st quintile</li> <li>➤ Strengthen public providers particularly in rural areas</li> </ul>
Low-High-Low	Region 3, Region 4A	<ul style="list-style-type: none"> <li>➤ Ensure quality of MCH services</li> <li>➤ Establish measures to sustain delivery of MCH services</li> </ul>
High-Low-High	Region 5	<ul style="list-style-type: none"> <li>➤ Expand health insurance to cover the poor particularly households in 1st and 3<sup>rd</sup> quintiles</li> <li>➤ Strengthen public health provision particularly in rural or geographically isolated and depressed areas</li> </ul>
Low-Low-High	ARMM	<ul style="list-style-type: none"> <li>➤ Strengthen the local health service delivery system, with particular focus on reaching the rural or geographically isolated and depressed areas</li> <li>➤ Examine factors unique to the area that deter utilization</li> </ul>
High-varying Utilization levels-Low CI for antenatal and High CI (delivery)	All other regions	<ul style="list-style-type: none"> <li>➤ Target the poor in the delivery of health services</li> <li>➤ Promote skilled birth attendance and facility delivery</li> </ul>

In regions where there is high utilization of MCH services on the face of high disparity in household income between the richest and the poorest (Pattern One), this finding suggests the rich households have higher uptake of health services than the poorer households, whether fully subsidized by the government like immunization and antenatal care or those services that require out-of-pocket payments like skilled birth attendance and birth delivery in a health facility. Literature provides a lot of evidence on inequalities in

health utilization and health outcomes across socio-economic strata. Financial barriers in health service use at individual level can be viewed at two aspects: the household's capacity to pay and the availability of health insurance. Houweling et. al. [14] described poor-rich inequalities in maternity and child care utilization in 45 developing countries. Similar to the findings of present study, use of antenatal care and skilled birth attendance is higher among the rich compared to the poor households. Moreover, facility-based deliveries are also pro-rich. Immunization is also pro-rich but the disparity between the rich and the poor is smaller than the maternal care services. In World Bank's Filipino Report Card on Pro-Poor Services[15], better-off households visit health facilities more often than the poor. When the poor do need health services, they utilize public health facilities. Moreover, on the average, the rich spend 10 times more than the poor on health services. Several studies, however, showed that government financing and health insurance determines utilization and choice of maternal care. [16-19] For these regions, it is important to target insurance enrollment of the poorest population. On the supply side, public health facilities should be given assistance to ensure that they get health insurance accreditation as well as ample stock of drugs and medical supplies. This way, when the poorest members of health insurance access the public health facilities, they will be able to feel the significant reduction in medical expenditures due to the insurance card.

Two regions have low disparity in income among households and high uptake of health services regardless of household's economic status. Consistently, the concentration index of health services is low or close to zero which means that there is equal utilization across wealth quintiles (Pattern Two). In regions 3 and 4A, the concentration index of maternal and child health services are 0.1 or less except for delivery at health facility. But these two regions still have the most equal uptake for this delivery care service among the regions. As mentioned earlier, these regions are close to Metro Manila and home to most export processing zones, providing the residents jobs and gainful occupation. The challenge in these regions therefore lies in the sustainability of provision and quality of health services.

Yet another region shows high income disparity among households vis-à-vis low utilization of health services. The high concentration index in all maternal and child health services suggests that those who utilize the services belong to wealthier households (Pattern Three). However, exclusion from services may not only be due to lack of wealth. In a country as diverse as the Philippines, the extent and depth of exclusion from maternal and child care can also vary depending on geography. In a poor region like Region 5, the poor uptake of health services may not only be due to financial barrier but also due to unavailable or inaccessible maternal and child health services. Aside from improving the financial capacity of households to utilize health services through health insurance, ensuring and strengthening public health provision in rural or geographically isolated areas must be done to address the inequalities in uptake of health services.

In a region where both income disparity and utilization of services are low but the concentration index is high as in ARMM (Pattern Four), this finding suggests that only the richest of the population are able to utilize health services.<sup>2</sup> This may be due to financial and

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<sup>2</sup> Compared to other regions, utilization is below average even for those at the richest quintile in ARMM.

geographic barriers to health services for the majority of the population who may be living in depressed or geographically isolated areas. Another possible reason for low utilization is that pregnant women and mothers are not utilizing available services. Similar to Pattern Three, local health service delivery and health promotion activities must work and reach the rural areas, and financial risk protection for the population particularly the poor must be provided. It might also be important to examine beliefs and cultural preferences in the area that might deter utilization of maternal and child care services.

For the rest of the regions where income disparity is high, utilization is variable across living standards, but antenatal care is less unequal across quintiles while facility-based delivery is concentrated among the rich households (Pattern Five). This implies that whether utilization is high or low, the antenatal care uptake across living standards is almost the same while facility based delivery is only accessed by the rich. Thus, targeting the poor for the delivery of maternal health services can reduce the inequalities in utilization, particularly in health services where household will incur out of pocket spending (e.g. facility-based delivery or skilled birth attendants). Moreover, for regions that have low utilization, maternal and child health services must be strengthened.

## **VI. Conclusion**

This study shows that while the uptake of maternal and child health programs has been reasonably satisfactory, focus on the poor remains very low. There are also vast differences in patterns of utilization among regions. It is possible that health indicators in the aggregate level might have been showing improvement but when the outcomes are disaggregated according to wealth quintiles and regions, it is likely that only those in the richest quintile show improvements while the poor are left out.

Moreover, based on regional Gini coefficient five patterns of utilization and concentration of uptake of maternal and child health services are identified. Interventions to improve the health care delivery and financing may be formulated according to these patterns.

## VII. REFERENCES

1. WHO, *Maternal Mortality in 2000: Estimates developed by WHO, UNICEF, UNFPA*. 2004b, Geneva: WHO.
2. Campbell OMR and Graham WJ, *Strategies for reducing maternal mortality: getting on with what works*. Lancet, 2006. **368**: p. 1284-99.
3. Shah, I.H. and L. Say, *Maternal mortality and maternity care from 1990 to 2005: uneven but important gains*. Reprod Health Matters, 2007. **15**(30): p. 17-27.
4. DOH, *National Objectives for Health 2005-2010*. 2007, Manila: Department of Health.
5. DOH, *Health Sector Reform Agenda 1999-2004*. 1999, Manila: Department of Health.
6. UNDP, *Human Development Report 2004: Cultural Liberty in Today's Diverse World*. 2004, United Nations Development Programme.
7. DOH, *Safe Motherhood and Women's Health Program*. 2000.
8. WHO, *World Health Report 2005 Make every mother and child count*. 2005, World Health Organization: Geneva.
9. NSO, *National Demographic and Health Survey 2003*. 2004, NSO and ORC Macro: Galveston, Maryland.
10. Gwatkin, D., et al., *Socio-Economic Differences in Health Nutrition and Population in Pakistan*. 2000, HNP/Poverty Thematic Group of The World Bank.
11. Rutstein, S. and K. Johnson, *The DHS Wealth Index*. , in *DHS Comparative Reports 6*. 2004, ORC Macro: Calverton, Maryland.
12. Filmer, D. and L.H. Pritchett, *Estimating wealth effects without expenditure data--or tears: an application to educational enrollments in states of India*. Demography, 2001. **38**(1): p. 115-32.
13. Kakwani, N., A. Wagstaff, and E.v. Doorslaer, *Socioeconomic inequalities in health: Measurement, computation and statistical inference*. Journal of Econometrics, 1997. **77**(1): p. 87-104.
14. Houweling, T.A., et al., *Huge poor-rich inequalities in maternity care: an international comparative study of maternity and child care in developing countries*. Bull World Health Organ, 2007. **85**(10): p. 745-54.
15. WorldBank, *The Filipino Report Card on Pro-Poor Services*. 2000, Pasig City, Philippines: World Bank.
16. Kruk, M.E., et al., *Health care financing and utilization of maternal health services in developing countries*. Health Policy Plan, 2007. **22**(5): p. 303-10.
17. Hotchkiss, D.R., *The tradeoff between price and quality of services in the Philippines*. Soc Sci Med, 1998. **46**(2): p. 227-42.
18. Celik, Y. and D.R. Hotchkiss, *The socio-economic determinants of maternal health care utilization in Turkey*. Soc Sci Med, 2000. **50**(12): p. 1797-806.
19. Falkingham, J., *Poverty, out-of-pocket payments and access to health care: evidence from Tajikistan*. Soc Sci Med, 2004. **58**(2): p. 247-58.