Are there Regional Variations in the Utilization of Maternal and Child Care Services Across Income Groups?

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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 Millennium Development Goals (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.

INTRODUCTION

Deaths due to pregnancy and childbirth still persist, with more than 99 percent of annual maternal deaths occurring in developing countries (WHO 2004). Effective interventions to reduce the risk of maternal mortality have been identified (Campbell and Graham 2006) yet about half a million 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 (Shah and Say 2007). 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, with priority given to the vulnerable populations, 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 (MTPDP) 2004–2010, the National Objectives for Health 2005–2010, and the Fourmula One for Health (the Department of Health [DOH] implementation framework for health reforms).

Despite the government's efforts, however, the reduction of maternal deaths was slow, from an estimated 209 per 100,000 live births in 1987–1993 to 162 per 100,000 live births in 2006 (Family Planning Survey 2006) while the under-5 mortality rate has declined from 52 per 1000 live births in 1993 to 40 in 2004 (DOH 2007). Moreover, reports show that under-5 mortality and maternal mortality rates by province show large differentials. For example, in both 1990 and 1995, the infant and maternal mortality rates of top five high mortality provinces are twice as high as the five lowest mortality provinces (DOH 1999). In addition, the child mortality rate among children 2–4 years old per 1,000 live births in National Capital Region (NCR) was seven while Autonomous Region of Muslim Mindanao (ARMM) was 30. Maternal mortality rate ranges from 119 in NCR and 320 in ARMM. With these figures, it is not surprising that the projected life expectancy of females in 2005 was 74 in NCR and 62 in ARMM while males in NCR outlived women by about 12 years longer than those in ARMM, with 69 years as opposed to only 58 in the latter.

OVERVIEW OF THE MATERNAL AND CHILD CARE PROGRAMS
The maternal and child care programs include pre-pregnancy services, antenatal, delivery, postpartum care; also newborn care, immunization, breastfeeding, maternal and child nutrition through micronutrient supplementation and food fortification, and integrated management of common childhood illnesses, among others (DOH 2000). Although all these services are provided by public providers, there is a parallel provision of these services by the private sector, particularly those involving personal maternal and child health care like antenatal, assisting in delivery, and management of common childhood illnesses. Public health interventions like immunization and micronutrient supplementation are mostly provided by the public sector. Thus, the financing of maternal and child care services come from mixed sources, mostly public financing for those services provided at the public facilities and, until recently, private financing for those services provided by the private providers. In 2000, the Philippine Health Insurance Corporation (PhilHealth), the government’s health insurance system, developed a package for maternal care service which was enhanced in 2003 to cover the
continuum of maternal care services including prenatal care, normal delivery, newborn care, postpartum care, and family planning counseling that can be provided by both accredited hospital and nonhospital facilities. Under this current health delivery system, there are several combinations of utilizing the different maternal and child care services. For example, a woman utilizes family planning services at the health center without cost (if free family planning commodities are available at that facility), goes to the health center for prenatal care when she gets pregnant, delivers her baby at home with the family paying out-of-pocket to whoever assisted in the delivery, and goes back to the health center again for postpartum and postnatal care for her baby. In another scenario, a woman may utilize all these services through the private sector and be financed through private sources. The first example may be the reason for the 2003 Demographic and Health Survey (DHS) report that while 86 percent of pregnant women access antenatal care (ANC) services from a health professional, only 60 percent of them are assisted by a medical professional during birth. Although the quality of antenatal care, measured as a composite of antenatal care from DHS 2003 data (Lavado et al. 2008), is negatively correlated with maternal mortality rate (MMR) and under-5 mortality rate (U5MR), facility-based delivery is still critical in ensuring safe delivery.3 The Family Planning Survey in 2004 shows that both the nonpoor and the poor deliver at the health facility, with higher proportion among the nonpoor (56.2% versus 17.4%). Moreover, both of these groups utilize public health facilities more than the private ones, with 34.8 percent of the nonpoor and 14.9 percent of the poor utilizing public health facilities. These different scenarios of delivering and financing maternal and child care services in the country provide the background that emphasizes the three major gaps in the health care delivery system that increase the risk of dying among mothers and children (DOH 2009). These include: 1) gaps in the delivery of services, which may be breaks in the provision of continuum of services across various stages of life cycle; 2) gaps in the utilization of these services, which occur when clients do not avail of recommended services owing to lack of information, poor capacity to pay and poor geographic access, and personal beliefs; and 3) gaps resulting from weaknesses in the health system itself, which arise when the capacity to deliver services is lacking, financing is inadequate, regulations fail, and governance is weak.

To address these gaps, the DOH through the years has taken innovative strategies to protect mothers and children—from adopting the Safe Motherhood Initiative in 1988 to ensure that childbirth will be safe and will not carry with it

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3 A composite measure of quality ANC is developed by assigning 1 point for the following antenatal care-related questions asked in the DHS 2003: (1) weigh checked; (2) height checked; (3) blood pressure is 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. Levels of quality of care are classified as no antenatal care, poor quality ANC (1-3 points), fair ANC (4-6 points) and very good ANC (7-9 points).
the risk of death or disability for the woman and her infant; to developing the Women’s Health and Development Program in 1998 to examine not only biological but also sociocultural factors to understand the health needs of women; and investing in Women’s Health and Safe Motherhood to reduce the maternal mortality and morbidity by supporting the efforts at the local level to provide women’s health services to targeted groups and strengthening the DOH capability to support the local government units (LGUs) in carrying out these services/activities. More recently, the DOH applied the reform approach for the local implementation of an integrated Maternal, Neonatal, and Child Health and Nutrition (MNCHN) Strategy to rapidly reduce maternal and neonatal mortality. To address the risks that women, mothers, and children face, the MNCHN policy identified the minimum standard MNCHN services, which will be delivered through a seamless continuum of care that will focus on prepregnancy care, antenatal care, care during delivery, and postpartum and postnatal care (Annex 1).

These integrated MNCHN services will be provided through a delivery network of facilities and providers that consists of Comprehensive Emergency Obstetric and Neonatal Care Facilities (CEmONCs), Basic Emergency Obstetric and Neonatal Care Facilities (BEmONCs), and Women’s Health Teams that are configured in an interlocal health zone (ILHZ), health district, or integrated urban health system setup and supported by an adequate communication and transportation systems. The CEmONCs may be a district or provincial hospital while the BEmONCs may be a Barangay Health Station (BHS) or a Rural Health Unit (RHU). These facilities are identified in the provincewide and citywide health facilities rationalization plan to optimize the utilization of health facilities. Investments to improve the capacities of these facilities (whether through DOH support, LGU budget, or foreign funding) are reflected in the Provincewide Investment Plan for Health. The services provided by the different levels of MNCHN care are enumerated in Annex 3.

While the DOH is ensuring that critical investments and policies are in place to support the strategies that will reduce the maternal and newborn mortality, PhilHealth continues to enhance its maternal care package to ensure that mothers and their families will have financial protection when they utilize services related to maternal and neonatal care services. Moreover, PhilHealth does not only accredit nonhospital facilities like BHS and RHUs in implementing the maternal package but it also recognizes and accredits trained midwives to provide appropriate care to women during pregnancy and normal birth, including assessing the risks and recognizing signs of complications.

Considering that the Philippines is a signatory to achieve the MDGs 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.
METHODOLOGY

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

For the analysis on 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 Annex 2.

The indicators used to evaluate maternal and child health services are based on the recommendations of the Department of Health. Antenatal care is assessed using indicators such as timing of the first prenatal checkup (anytime during the first three months of pregnancy), the number of prenatal visits of a pregnant woman (at least four prenatal visits), and iron supplementation. Delivery care is evaluated using skilled birth attendance and deliveries done in a health facility while the indicator for child health care is a fully immunized child.

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). 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.

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 Demographic and Health Survey (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 (2004), 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, therefore, it is 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.

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 in Figure 1 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 is 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 1.

Accompanying concentration curves is 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. Concentration index $C$, is computed using the formula,

$$C = 2 \int_0^1 (L(p) - L(p_0)) dp,$$

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

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4 In assigning weighing values for indicator variables, ORC Macro used principal components analysis as suggested by Filmer and Pritchett. 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.
Figure 1. Concentration curve for deliveries in medical facilities

\[ C = (p_1L_2 - p_2L_1) + (p_2L_3 - p_3L_2) + \ldots + (p_{T-1}L_T - p_TL_{T-1}) \]

groups (O’Donnell et al. 2007). Statistical inference to test the significance of the indices is computed based on the formula derived by Kakwani et al. (1997).

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 (FIES) 2003 to identify the patterns of maternal and child health (MCH) services utilization among regions. In this study, regions are categorized as either having low (<0.40) or high (>0.45) Gini coefficient.

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, each household was ranked into quintiles based on its asset score. Third, patterns of utilization were analyzed depending on the woman’s level of welfare and region. Fourth, concentration curves were plotted and concentration indices were calculated to discern the extent of inequality. 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.

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 checkup 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 checkups during the first three months of pregnancy. It is also recommended that at least four antenatal checkups 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 DOH 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.5

Utilization of maternal and child health programs vary by region (Table 1). 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, Cordillera Administrative Region (CAR), Region 5, and Region 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 ARMM.

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5 If the sample for child immunization is to be based on vaccination cards, only 26 percent of the children will have complete immunization records.
Table 1. Antenatal, delivery care and immunization utilization, per region

<table>
<thead>
<tr>
<th>Regions</th>
<th>Checkup during first trimester</th>
<th>At least 4 antenatal visits</th>
<th>Iron supplementation</th>
<th>Births with skilled attendant</th>
<th>Births in a medical facility</th>
<th>Children fully immunized</th>
</tr>
</thead>
<tbody>
<tr>
<td>NCR</td>
<td>64.58</td>
<td>81.44</td>
<td>78.82</td>
<td>87.68</td>
<td>73.89</td>
<td>81.19</td>
</tr>
<tr>
<td>CAR</td>
<td>47.62</td>
<td>54.17</td>
<td>62.5</td>
<td>65.22</td>
<td>52.17</td>
<td>72.73</td>
</tr>
<tr>
<td>Region 1</td>
<td>53.85</td>
<td>61.64</td>
<td>80.82</td>
<td>72.6</td>
<td>27.4</td>
<td>76.06</td>
</tr>
<tr>
<td>Region 2</td>
<td>63.04</td>
<td>58.82</td>
<td>68.52</td>
<td>63.46</td>
<td>33.33</td>
<td>75.83</td>
</tr>
<tr>
<td>Region 3</td>
<td>59.38</td>
<td>74.24</td>
<td>82.09</td>
<td>93.33</td>
<td>47.01</td>
<td>75.80</td>
</tr>
<tr>
<td>Region 4A</td>
<td>61.76</td>
<td>72.07</td>
<td>77.78</td>
<td>76.67</td>
<td>46.67</td>
<td>73.56</td>
</tr>
<tr>
<td>Region 4B</td>
<td>46.94</td>
<td>67.92</td>
<td>80</td>
<td>29.63</td>
<td>18.52</td>
<td>68.32</td>
</tr>
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<td>27.17</td>
<td>54</td>
<td>73.27</td>
<td>54.55</td>
<td>28</td>
<td>61.98</td>
</tr>
<tr>
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<td>44.79</td>
<td>66.67</td>
<td>85.29</td>
<td>46</td>
<td>33.33</td>
<td>78.54</td>
</tr>
<tr>
<td>Region 7</td>
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<td>73.73</td>
<td>90.6</td>
<td>70.94</td>
<td>47.01</td>
<td>73.98</td>
</tr>
<tr>
<td>Region 8</td>
<td>28.17</td>
<td>56.58</td>
<td>72</td>
<td>39.47</td>
<td>19.23</td>
<td>70.25</td>
</tr>
<tr>
<td>Region 9</td>
<td>58.82</td>
<td>62.07</td>
<td>72.41</td>
<td>40</td>
<td>20.34</td>
<td>60.28</td>
</tr>
<tr>
<td>Region 10</td>
<td>45.16</td>
<td>55.22</td>
<td>76.47</td>
<td>43.28</td>
<td>32.84</td>
<td>67.79</td>
</tr>
<tr>
<td>Region 11</td>
<td>51.67</td>
<td>68.75</td>
<td>78.13</td>
<td>51.61</td>
<td>46.77</td>
<td>68.18</td>
</tr>
<tr>
<td>Region 12</td>
<td>55.38</td>
<td>70.42</td>
<td>71.83</td>
<td>32.86</td>
<td>21.43</td>
<td>74.51</td>
</tr>
<tr>
<td>Region 13</td>
<td>46.51</td>
<td>76.74</td>
<td>84.78</td>
<td>46.67</td>
<td>29.55</td>
<td>76.53</td>
</tr>
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<td>ARMM</td>
<td>28.57</td>
<td>43.1</td>
<td>55.17</td>
<td>31.03</td>
<td>15.52</td>
<td>51.67</td>
</tr>
<tr>
<td>National</td>
<td>64.56</td>
<td>75.91</td>
<td>55.59</td>
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</tr>
</tbody>
</table>

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

INEQUALITIES IN UTILIZATION OF MCH SERVICES

Inequalities in antenatal care, delivery care, and immunization

As Table 2 shows, inequality in utilization is evident across asset quintiles. Those in the richest quintile are two times more likely to have an antenatal checkup than those in the poorest and second quintile. Similarly, pregnant women who have at least four antenatal checkups during the duration of pregnancy vary depending on asset quintiles—90 percent of the richest having adequate number of checkups while only 50 percent of those in the poorest quintile does. Among the three antenatal indicators, iron supplementation has the flattest curve indicating relatively equal access between the rich and the poor.

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 to have births attended by a health professional than the poorest. 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.
Utilization of delivery care services is more varied 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*.

To formalize the definition of inequality between quintiles, concentration curves for these five indicators are presented in Figure 2. The service with the most unequal utilization is facility-based delivery followed by births with professional assistance. Iron supplementation 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 checkups 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.

The disparity across wealth quintiles in terms of the extent of utilizing the maternal care services, namely, checkup during the first trimester, at least four antenatal visits, iron supplementation, birth assisted by skilled attendant, and facility-based delivery, is shown in Table 3. Those who did not utilize any of the maternal care services are highest among the poorest quintile while those who were able to avail of all the five services are highest among the richest group.

### Table 2. Antenatal, delivery care and immunization, utilization by wealth quintiles, and concentration indices

<table>
<thead>
<tr>
<th>Asset quintiles</th>
<th>Checkup during first trimester</th>
<th>≥ 4 antenatal visits</th>
<th>Iron supplementation</th>
<th>Births with skilled attendant</th>
<th>Births in a medical facility</th>
<th>Fully immunized</th>
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<tbody>
<tr>
<td>Poorest</td>
<td>37.93</td>
<td>50.34</td>
<td>64.65</td>
<td>22.22</td>
<td>8.75</td>
<td>57.35</td>
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<tr>
<td>2nd</td>
<td>37.78</td>
<td>58.02</td>
<td>76.69</td>
<td>48.99</td>
<td>24.32</td>
<td>70.4</td>
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<tr>
<td>Middle</td>
<td>44.44</td>
<td>61.64</td>
<td>78.57</td>
<td>64.75</td>
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</tr>
<tr>
<td>4th</td>
<td>56.94</td>
<td>77.21</td>
<td>80.07</td>
<td>83.84</td>
<td>53.54</td>
<td>79.9</td>
</tr>
<tr>
<td>Richest</td>
<td>73.87</td>
<td>90.03</td>
<td>89.19</td>
<td>91.22</td>
<td>76.69</td>
<td>83.96</td>
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<td>All</td>
<td>50.61</td>
<td>67.42</td>
<td>77.82</td>
<td>62.19</td>
<td>39.86</td>
<td>72.8</td>
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<tr>
<td>Concentration Index</td>
<td>0.1502</td>
<td>0.1222</td>
<td>0.0516</td>
<td>0.2296</td>
<td>0.3452</td>
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<td>Std. error</td>
<td>0.015</td>
<td>0.01</td>
<td>0.01</td>
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<td>0.015</td>
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Utilization of delivery care services is more varied 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 2. Concentration curve for maternal health care utilization

![Concentration curve for maternal health care utilization](image)

**Figure 2. Concentration curve for maternal health care utilization**

**Table 3. Extent of utilization of maternal care services, by wealth quintile (in percent)**

<table>
<thead>
<tr>
<th>Quintile</th>
<th>0</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poorest</td>
<td>61.64</td>
<td>47.45</td>
<td>41.63</td>
<td>27.62</td>
<td>11.00</td>
<td>5.23</td>
</tr>
<tr>
<td>Poor</td>
<td>23.29</td>
<td>32.65</td>
<td>30.20</td>
<td>30.16</td>
<td>19.67</td>
<td>10.10</td>
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<td>Middle</td>
<td>13.70</td>
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<td>17.55</td>
<td>22.22</td>
<td>27.00</td>
<td>20.56</td>
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<tr>
<td>Richer</td>
<td>1.37</td>
<td>5.61</td>
<td>6.12</td>
<td>14.29</td>
<td>25.00</td>
<td>29.27</td>
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<td>Richest</td>
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<td>4.49</td>
<td>5.71</td>
<td>17.33</td>
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</tbody>
</table>

**NOTE:** Maternal care services in this study include checkup during the first trimester, at least four antenatal services, iron supplementation, birth assisted by skilled attendant, and delivery at a health facility. Zero means none of the five services were utilized; 1–4 means any 1–4 combination of the services was utilized; and 5 means all of the services were utilized.

Compared to indicators of maternal delivery, utilization of immunization services is not very unequal as shown in Figure 3. 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.
Patterns of regional inequalities

Table 4 shows the disparity across regions in terms of the extent of utilization of different maternal care services considered in this study. Those who did not utilize any of maternal care services are highest in ARMM, followed by Region V and Region VIII. In contrast, those who were able to complete all five services are highest in the NCR, followed by Regions 3 and 7.

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

According to the Medium-Term Philippine Development Plan (MTPDP) 2004–2010, the regions with the highest poverty incidence do not necessarily have high level of inequality. Table 5 shows that the ARMM, 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 FIES in 2003. 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 5. First, regions with highly urbanized cities, such as Regions 11, 7, and the NCR, have high Gini coefficients, high utilization rates, and relatively high concentration indices. Second, there are
Table 4. Extent of utilization of maternal care services, by region (in percent)

<table>
<thead>
<tr>
<th>Region</th>
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<th>2</th>
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<tr>
<td>National Capital Region</td>
<td>2.74</td>
<td>2.55</td>
<td>6.53</td>
<td>7.94</td>
<td>17.00</td>
<td>26.13</td>
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<td>Cordillera Administrative Region</td>
<td>4.11</td>
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<td>3.27</td>
<td>1.90</td>
<td>3.67</td>
<td>4.18</td>
</tr>
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<td>I - Ilocos</td>
<td>4.11</td>
<td>3.57</td>
<td>4.08</td>
<td>5.08</td>
<td>5.67</td>
<td>4.18</td>
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<td>1.37</td>
<td>5.10</td>
<td>2.86</td>
<td>6.98</td>
<td>2.67</td>
<td>3.83</td>
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<td>III - Central Luzon</td>
<td>1.37</td>
<td>3.57</td>
<td>4.08</td>
<td>6.35</td>
<td>10.67</td>
<td>9.06</td>
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<tr>
<td>IVA - CALABARZON</td>
<td>5.48</td>
<td>7.14</td>
<td>2.86</td>
<td>9.52</td>
<td>11.33</td>
<td>13.59</td>
</tr>
<tr>
<td>IVB - MIMAROPA</td>
<td>2.74</td>
<td>5.61</td>
<td>8.98</td>
<td>5.08</td>
<td>4.67</td>
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<td>V - Bicol</td>
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<tr>
<td>VI - Western Visayas</td>
<td>6.85</td>
<td>6.63</td>
<td>5.31</td>
<td>6.35</td>
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<tr>
<td>VII - Central Visayas</td>
<td>2.74</td>
<td>6.63</td>
<td>7.76</td>
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<td>8.67</td>
<td>9.06</td>
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<td>VIII - Eastern Visayas</td>
<td>9.59</td>
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<td>10.20</td>
<td>4.44</td>
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<td>IX - Zamboanga Peninsula</td>
<td>0.00</td>
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<td>1.39</td>
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<td>X - Northern Mindanao</td>
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<td>4.90</td>
<td>6.67</td>
<td>2.33</td>
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<tr>
<td>XI - Davao</td>
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<tr>
<td>XII - SOCCSKSARGEN</td>
<td>5.48</td>
<td>5.10</td>
<td>6.94</td>
<td>8.89</td>
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<td>XIII - Caraga</td>
<td>4.11</td>
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<td>3.67</td>
<td>7.94</td>
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<tr>
<td>ARMM</td>
<td>24.66</td>
<td>9.69</td>
<td>8.16</td>
<td>3.81</td>
<td>1.67</td>
<td>1.74</td>
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</table>

NOTE: Maternal care services in this study include checkup during the first trimester, at least four antenatal services, iron supplementation, birth assisted by skilled attendant, and delivery at a health facility. Zero means none of the five services were utilized; 1–4 means any 1–4 combination of the services was utilized; and 5 means all of the services were utilized.

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 ARMM 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, varying levels of utilization, and low levels of concentration indices for antenatal care and high levels for delivery care.

Provinces in Regions 3 and 4A are in close proximity to Metro Manila. Due to the high price 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 (Ballesteros 2000). 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.
Figure 4 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.

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. 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.

Table 5. Gini coefficients and concentration index for maternal and child health services

<table>
<thead>
<tr>
<th></th>
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<td>NCR</td>
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<td>0.40</td>
<td>0.27</td>
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<td>0.12</td>
<td>0.14</td>
<td>0.24</td>
<td>0.06</td>
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<td>CAR</td>
<td>32.2</td>
<td>0.43</td>
<td>0.17</td>
<td>0.25</td>
<td>0.22</td>
<td>0.28</td>
<td>0.14</td>
<td>0.1</td>
</tr>
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<td>Region 1</td>
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<td>0.17</td>
<td>0.06</td>
<td>0.19</td>
<td>0.52</td>
<td>0.06</td>
</tr>
<tr>
<td>Region 2</td>
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<td>0.09</td>
<td>0.15</td>
<td>0.08</td>
<td>0.20</td>
<td>0.35</td>
<td>0.06</td>
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<tr>
<td>Region 3</td>
<td>17.5</td>
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<td>0.05</td>
<td>0.06</td>
<td>0.38</td>
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<td>Region 4A</td>
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<td>0.1</td>
<td>0.28</td>
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<td>Region 4B</td>
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<td>0.35</td>
<td>0.38</td>
<td>0.07</td>
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<tr>
<td>Region 5</td>
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<td>0.47</td>
<td>0.28</td>
<td>0.16</td>
<td>0.07</td>
<td>0.19</td>
<td>0.40</td>
<td>0.11</td>
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<td>Region 6</td>
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<td>0.25</td>
<td>0.32</td>
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<td>Region 7</td>
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<td>0.30</td>
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<tr>
<td>Region 8</td>
<td>43.0</td>
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<td>0.26</td>
<td>0.09</td>
<td>0.03</td>
<td>0.26</td>
<td>0.37</td>
<td>0.12</td>
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<tr>
<td>Region 9</td>
<td>49.2</td>
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<td>0.06</td>
<td>0.22</td>
<td>0.21</td>
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<td>Region 10</td>
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<td>0.09</td>
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<td>0.20</td>
<td>0.26</td>
<td>0.10</td>
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<td>Region 11</td>
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<td>0.27</td>
<td>0.09</td>
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<td>Region 12</td>
<td>38.4</td>
<td>0.48</td>
<td>0.03</td>
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<td>0.34</td>
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<td>Region 13</td>
<td>54.0</td>
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<td>0.05</td>
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<td>0.07</td>
<td>0.39</td>
<td>0.48</td>
<td>0.11</td>
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<tr>
<td>ARMM</td>
<td>52.8</td>
<td>0.36</td>
<td>0.21</td>
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<td>0.14</td>
<td>0.26</td>
<td>0.41</td>
<td>0.07</td>
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<tr>
<td>National</td>
<td>30.0</td>
<td>0.46</td>
<td>0.15</td>
<td>0.12</td>
<td>0.05</td>
<td>0.23</td>
<td>0.35</td>
<td>0.08</td>
</tr>
</tbody>
</table>

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. Standard errors in parenthesis.
services and the patterns of inequality have implications to the uptake of health services in the area. Region 5 is not only poor but has one of the most unequal patterns of utilization, with an exclusion pattern similar to that of NCR (Figure 5). 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 (Figure 4). 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 4.** Difference in the pattern of exclusion in the National Capital Region and Autonomous Region of Muslim Mindanao for births in health facilities

![Graph showing difference in pattern of exclusion](image)

**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 6 summarizes the possible policies or strategies that must be in place or strengthened to reduce the inequalities in MCH services utilization.

In regions where there is high utilization of MCH services vis-à-vis high disparity in household income and utilization of services between the richest and the poorest (Pattern One), this finding suggests that 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 facility-based
Figure 5. Difference in the pattern of exclusion in Metro Manila and the Bicol region for births assisted by medical professional

![Graph showing the difference in the pattern of exclusion in Metro Manila and the Bicol region for births assisted by medical professional.](image)

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

Table 6. Patterns of Gini coefficient, utilization and concentration index, and potential policy focus

<table>
<thead>
<tr>
<th>Gini-Utilization-CI</th>
<th>Region</th>
<th>Potential Policy Focus</th>
</tr>
</thead>
</table>
| High-High-High      | NCR, Region11, Region 7 | ➢ expand health insurance to cover the poor particularly households in 1st quintile  
➢ strengthen the delivery of maternal and child health services to target the poor |
| Low-High-Low        | Region 3, Region 4A      | ➢ ensure the sustainability of available and complete maternal and child health services and efficient financing mechanisms to fund these services |
| High-Low-High       | Region 5                 | ➢ expand health insurance to cover the poor particularly households in 1st and 3rd quintiles  
➢ strengthen the maternal and child health services by identifying weaknesses in local health system including gaps in service delivery and effective financing schemes for these services |
| Low-Low-High        | ARMM                    | ➢ expand health insurance to cover the poor  
➢ strengthen the maternal and child health services by identifying weaknesses in local health system including gaps in service delivery and effective financing schemes for these services  
➢ examine factors unique to the area that deter utilization of health services |
| Utilization levels - Low CI for antenatal and High CI (delivery) | All other regions | ➢ expand health insurance to cover the poor  
➢ ensure the sustainability of available and complete maternal and child health services and efficient financing mechanisms to fund these services |
delivery. Literature provides a lot of evidence on inequalities in health utilization and health outcomes across socioeconomic 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. (2007) described poor-rich inequalities in maternity and child care utilization in 45 developing countries. Similar to the findings of the present study, the use of antenatal care and skilled birth attendance is higher among the rich compared to the poor households. Moreover, facility-based deliveries are also prorich. Likewise, immunization is prorich but the disparity between the rich and the poor is smaller than in maternal care services. In World Bank’s Filipino Report Card on Propoor Services, 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 (Kruk et al. 2007; Hotchkiss 1998; Celik and Hotchkiss 2000; Falkingham 2004; WHO 2005). It is important to expand the health insurance to enroll the poorest population for these regions. On the supply side, the public health facilities that are accessible to the poor must be improved so as to qualify for PhilHealth accreditation and ample stock of drugs and medical supplies must be made available. This way, when the poorest members of PhilHealth access the public health facilities, they will be able to feel the financial risk protection that their PhilHealth membership provides.

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 is 0.1 or less except for facility-based delivery. Although the three trends (Gini, utilization, and concentration index) in Pattern Two may look good, the sustainability of available and comprehensive maternal and child health services must be assured and efficient financing mechanisms to fund these services must be in place.

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 capacity to pay. 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. The policy and strategies must focus, therefore, in providing financial risk protection for the population, especially the poor, and ensuring that maternal and child health services are available and accessible.
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. This may be due to financial, geographic, and cultural barriers to health services for the majority of the population who may be living in depressed or geographically isolated areas. Similar to Pattern Three, policy and strategies must focus on providing financial risk protection for the population, especially the poor, and ensuring that maternal and child health services are available and accessible. 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, expanding the health insurance to cover the poor, ensuring available and comprehensive maternal and child health services provided in a continuum of care, and establishing efficient financing mechanisms to fund these services must be the priority strategies.

The findings of this study provide yet another evidence to support the policy of the DOH in terms of investing in priority provinces. Current investments to support the implementation of MNCHN strategy to reduce the maternal and neonatal mortality focus on regions ARMM, Regions 7, 11, and 5, regions that exhibited high disparity in service utilization regardless of utilization levels (DOH 2009). Moreover, the findings of this study call for an implementation of a continuum of maternal and child care services so that these services will be available regardless of the woman’s economic standing or residence. The focus of the DOH on MNCHN to rapidly reduce the maternal and neonatal deaths and the comprehensive list of services to be provided from prepregnancy to postnatal/postpartum care across different levels of care (Women’s Health Team, BEmONC, CEmONC) if coupled with wider coverage of PhilHealth membership to prioritize the poor and better benefit package for maternal and child care services that reduce, if not totally remove, copayment, the disparities in the utilization of maternal and child care across wealth quintile and across regions can be reduced, if not totally eliminated.

Since the sampling structure of NDHS allowed only for regional comparisons, this study looked at inequalities at the regional level. In the context of decentralization, however, provinces, cities, and municipalities are those that are in the frontline in the delivery of maternal and child health services. In future studies, more effort should be put in place in collecting information at a lower level of disaggregation to understand how services are being delivered at local government units.

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6 Compared to other regions, utilization is below average even among the richest quintile in ARMM.
CONCLUSION

This study shows that while the uptake of maternal and child health programs has been reasonably satisfactory, the poor continues to have low utilization of maternal and child care services, not only in utilizing each maternal care service but in terms of completeness of the utilized services. Moreover, vast differences in patterns and extent of utilization across regions exist. Women residing in richer regions have higher and more complete utilization of maternal and child care services while the poorer regions are left out.

To address the disparities of utilizing maternal and child care services across wealth and regions, this study proposes two main strategies: 1) ensuring available and comprehensive maternal and child health services provided in a continuum of care by investing in and getting accreditation for public health facilities that are utilized by the poor, especially in regions with low utilization and high concentration index and 2) providing financial risk protection for the population, especially the poor, by expanding the national health insurance membership coverage and developing better benefit package for maternal and child care services that will reduce, if not remove, copayment especially in regions where disparity in income is already high.
Prepregnancy care

- correct provision and responsive counseling for fertility awareness, maternal nutrition, birth spacing, and adolescent health
- active identification and servicing of those who have unmet family planning needs for family planning and referral to alternative sources of services and supplies when these are not available in one’s service outlet or facility
- assurance of a safety net of free family planning services and supplies for indigent potential users
- provision of other basic and essential services for young female and women in reproductive age group

Antenatal Care

- provision of eight essential antenatal care services, which include monitoring of height and weight, taking blood pressure, blood testing, urine testing, iron and folate supplementation, tetanus toxoid immunization, malaria prophylaxis whenever necessary, and birth planning
- focused attention to individualized counseling for birth preparedness
- discussion with household members and preparation for childbirth with partner support and involvement in care-seeking decisions

Care during delivery

- proper channeling of patient workloads with aggressive promotion of shifting from home-based deliveries to delivery in either a BEmONC or CEmONC facility, especially for women with medical conditions and other special needs by classifying them as priority for transport and servicing by the appropriate delivery/birthing facility
- deliberate planning and special provisions for hard-to-reach segments of the population within the province or citywide health system to promote facility-based deliveries
- active conversion and mobilization of traditional birth attendants into advocates and agents of facility-based deliveries
- correct and updated monitoring and reporting of the number and proportion of facility-based deliveries

Postpartum and postnatal care

- provision of proper postpartum/postnatal care for mothers and neonates
- provision of the whole range of women’s health care services for mothers and child survival package for children

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* Women’s health care services include, among others, postabortion care, interpregnancy interval counseling, breast and cervical cancer screening, assessing maternal nutrition, tetanus toxoid immunization, counseling on healthy lifestyle, and prevention and management of other diseases. Child survival services include skilled attendance by health professionals during pregnancy, delivery and the immediate postpartumcare, care of the newborn, breastfeeding and complementary feeding, micronutrient supplementation and deworming, immunization of children and mothers, integrated management of sick children, child injury prevention and control, birth spacing, and proper personal hygiene.
Annex 2. Demographic and health survey composition

<table>
<thead>
<tr>
<th>Total Number of Household</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>12,586</td>
</tr>
</tbody>
</table>

- Of which
  - Individual members of households: 61,864

- Of which
  - Women interviewed: 13,633

- Of which
  - 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

- Of which
  - 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

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

Annex 3. Services provided by different facilities and providers in an MNCHN network

Women's Health Team
- early detection and referral of high risk pregnancies
- advocacy for birth spacing and counseling for family planning services
- tracking and masterlisting of pregnant women
- assisting pregnant women and their families in formulating a birthing plan
- reporting of maternal and neonatal deaths
- facilitating community issues affecting mothers and children

Basic Emergency Obstetric and Neonatal Care (BEmONC) Facility
- six signal obstetric functions\(^6\)
- neonatal emergency interventions\(^c\)
- blood transfusion services

Comprehensive Emergency Obstetric and Neonatal Care (CEmONC)
- six signal obstetric functions and caesarian section
- blood banking and transfusion services
- neonatal emergency interventions and management of low birth weight or premature newborn and other specialized neonatal services

\(^6\) Six signal obstetric functions include: 1) parenteral administration of oxytocin on the third stage of labor; 2) parenteral administration of loading dose of anticonvulsants; 3) parenteral administration of initial dose of antibiotics; 4) performance of assisted deliveries; 5) removal of retained products of conception; and (6) manual removal of retained placenta.

\(^c\) Neonatal emergency interventions include at the minimum: 1) newborn resuscitation; 2) treatment of neonatal sepsis/infection; and 3) oxygen support.
REFERENCES


_____ . 2000. *Safe motherhood and women’s health program*.


