Gradients in Wealth Quintile and Access to Maternal Care Services: Reanalysis of Data from the Philippines National Demographic and Health Survey 2013

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ABSTRACT

Objective. To quantify the magnitude of difference in access to selected maternal care services among Filipino women who belong to different income groups.

Methods. Point and interval estimates of the inter-quintile difference in access to a selected maternal care services (family planning; antenatal care; facility-based delivery; skilled birth attendance; and postnatal care) were constructed using weighed coverage data from the Philippines National Demographic and Household Survey 2013.

Results. There is a generally increasing trend in inter-quintile differences in coverage from the lowest to the highest income quintile group (Q1-Q4 > Q1-Q3 > Q1-Q5 > Q1-Q2 > Q2-Q5 > Q2-Q4 > Q3-Q5 > Q3-Q4 > Q2-Q4 > Q4-Q5). Differences in maternal care access between wealth groups ranged from less than 1% for antenatal care (D_{Q2-Q3} −0.4% [95% CI −1.9% to 1.1%]) to as much as 60% for facility-based delivery (D_{Q1-Q5} −58.4% [95% CI −61.2% to −55.6%]). Such differences persist even between the two highest quintiles (facility based delivery D_{Q4-Q5} −9.7% [95% CI −12.5% to −6.9%]).

Conclusion. Gradients in access to selected maternal care services exist among Filipino women who belong to different wealth quintiles. The call for stakeholders, therefore, is to intensify efforts to narrow such gaps because, within and across communities, we affirm that no women "should die in the course of the normal process of reproduction" and no families must suffer the devastating consequences of such an occurrence.

Key Words: healthcare disparities, maternal health services, Philippines

Introduction

The burden of maternal deaths in the Philippines, a developing, lower-middle-income economy[1] in the Western Pacific,[2] precludes the country from attaining the global[3] and national[4] goals of improving the status of maternal health. International estimates place the country's maternal mortality ratio at around 120 per 100,000 live births in 2013,[5] while local authorities reported a higher figure of 221 per 100,000 live births in 2011,[6] both of which are not far from their 1990 levels. In response, stakeholders have identified essential clinical and public health interventions at the community and health facility levels to ensure early recognition and facilitate prompt treatment of preventable causes of maternal ill-health across the continuum of maternal care and thereby avert unnecessary maternal deaths.[7,8]

Availability of resources and packages of essential interventions, however, do not necessarily translate to actual receipt of necessary care when and where it is needed. Disparities or inequities in healthcare access and, ultimately, health status, across different groups of individuals are well-known.[9,10,11] In maternal health, the Three Delays Model posits that socioeconomic and cultural factors, accessibility of facilities, and quality of care result to decisions, at both the provider and client sides, that delay the receipt by women of appropriate care during pregnancy, delivery and the post-natal period.[12] Measurement of disparities in access to maternal health services have been carried out in several settings,[13,14,15] but literature in and about the Philippines is, to the author's knowledge, sparse. Information on health inequities becomes more resonant as the country moves towards attainment of universal health care.[16] Thus, the current research was carried out to fill this gap in knowledge.

This paper aims to quantify the magnitude of difference in access to selected maternal care services among Filipino women who belong to different income groups.

Materials and Methods

Data source

Weighed proportions of reported access to selected maternal care services, stratified by wealth quintile, were obtained from the final report of the Philippines National Demographic and Health Survey (NDHS) 2013.[17] The selected services represent the minimum package of services recommended by international and local bodies across the continuum of maternal care (pre-pregnancy,

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during pregnancy and delivery, and after delivery) (Table 1).[7,8] Data was encoded in Microsoft® Office Excel® 2007 (12.0.6718.5000) SP3 MSO (12.0.6718.5000) for processing and analysis.

Data analysis

The point estimates of the inter-quintile difference in access to a particular maternal care service were computed as the difference between the reported coverage for a higher quintile (p_2) from the coverage for a lower quintile (p_1):

$$Point\ Estimate\ of\ Interquintile\ Difference\ (D) = p_1 - p_2$$

Interval estimates at the 95% confidence level for each inter-quintile difference for a particular maternal care service were constructed from the pooled standard error for the difference between two proportions (n_1 represent the sample size of the lower quintile, while n_2 represent the sample size for the higher quintile):

$$Interval\ Estimate = D \pm 1.96 \sqrt{\frac{p_1(1-p_1)}{n_1} + \frac{p_2(1-p_2)}{n_2}}$$

Thus, negative values for both point and interval estimates of inter-quintile differences indicate that the level of reported coverage for a particular maternal care service is greater for the higher compared to the lower quintile group (i.e., $p_1 < p_2$), while positive values indicate the opposite (i.e., $p_1 > p_2$).

Analysis was supplemented through generation of simple tables and graphs using Microsoft® Office Excel® 2007 (12.0.6718.5000) SP3 MSO (12.0.6718.5000).

Comparison was carried out in three phases: a) across all quintiles and across all identified maternal care services (10 comparison groups for all five services); b) between adjacent quintiles for all identified maternal care services (four comparison groups for all five services); and c) across all quintiles for each specific maternal care service (10 comparison groups for each of the five services).

Results

Data of a nationally representative sample of women from at least 2,697 (women with a live birth in the two years preceding the survey) to at most 9,729 (currently married women age 15-49) respondents were derived from the NDHS report. The distribution of respondents by wealth quintile for each sample population is shown in Table 2.

Table 1. Selected indicators, classified across the continuum of maternal care, reported in the Philippines National Demographic and Household Survey 2013

Phase	Service	NDHS Indicator
Pre-pregnancy	Family planning	Proportion of currently married women age 15-49 currently using any modern method of contraception. Modern methods of contraception include permanent methods (bilateral tubal ligation and vasectomy), artificial methods (intrauterine devices, oral pills, injectables and implants), and natural methods (cervical mucus method, basal body temperature, symptothermal method, standard days method, and lactational amenorrhea method.
Pregnancy	Antenatal care	Proportion of women age 15-49 who had a live birth in the preceding five years who received antenatal care from a skilled professional (i.e., physician, nurse or midwife)
Delivery	Facility-based delivery	Proportion of live births in the preceding five years delivered in a health facility
Delivery	Skilled birth attendance	Proportion of live births in the preceding five years delivered by a skilled provider (i.e., physician, nurse or midwife)
Post-delivery	Postnatal care	Proportion of women age 15-49 giving birth in the preceding two years who received a postnatal check-up in the first two days after giving birth

Table 2. Distribution of women respondents to the NDHS, by maternal care service and wealth quintile, Philippines 2013

Sample Population (Maternal care service)	Respondents					
	Quintile 1 (Lowest)	Quintile 2	Quintile 3	Quintile 4	Quintile 5 (Highest)	Total
Currently married women age 15-49 (Use of contraception)	1,945 *20.0%*	1,919 *19.7%*	1,996 *20.5%*	2,012 *20.7%*	1,857 *19.1%*	9,729 *100.0%*
Women age 15-49 who had a live birth in the preceding five years (Antenatal care)	1,277 *24.6%*	1,098 *21.2%*	1,062 *20.5%*	962 *18.5%*	789 *15.2%*	5,188 *100.0%*
Live births in the preceding five years (Facility-based delivery and skilled birth attendance)	1,916 *27.4%*	1,525 *21.8%*	1,395 *20.0%*	1,214 *17.4%*	932 *13.3%*	6,982 *100.0%*
Women age 15-49 giving birth in the preceding two years (Postnatal care)	686 *25.4%*	585 *21.7%*	587 *21.8%*	480 *17.8%*	359 *13.3%*	2,697 *100.0%*

Table 3. Reported coverage for each maternal care service, by wealth quintile, Philippines 2013 (National Demographic and Health Survey)

Indicator	Coverage (%)					
	Quintile 1 (Lowest)	Quintile 2	Quintile 3	Quintile 4	Quintile 5 (Highest)	Total
Proportion of currently married women age 15-49 currently using any modern method of contraception	33.0	40.3	41.4	39.1	34.0	37.6
Proportion of women age 15-49 who had a live birth in the preceding five years who received antenatal care from a skilled professional	88.5	96.3	96.7	99.4	98.6	95.4
Proportion of live births in the preceding five years delivered in a health facility	32.8	55.0	69.0	81.5	91.2	61.1
Proportion of live births in the preceding five years delivered by a skilled provider	42.2	71.0	83.8	92.4	96.2	72.8
Proportion of women age 15-49 giving birth in the preceding two years who received a postnatal check-up in the first two days after giving birth	46.4	69.3	80.1	86.8	92.0	72.0

Table 4. Distribution of women respondents to the NDHS, by maternal care service and wealth quintile, Philippines 2013

Wealth Quintile Comparison	Rank				
	Use of any modern method of contraception	Antenatal care from a skilled professional	Live births delivered in a health facility	Live births delivered by a skilled provider	Postnatal check-up in the first two days after giving birth
Q1 - Q2	3	4	6	4	4
Q1 - Q3	1	3	3	3	3
Q1 - Q4	5	1	2	2	2
Q1 - Q5	10	2	1	1	1
Q2 - Q3	9	10	8	7	8
Q2 - Q4	8	5	5	6	6
Q2 - Q5	4	7	4	5	5
Q3 - Q4	7	6	9	9	9
Q3 - Q5	2	8	7	8	7
Q4 - Q5	6	9	10	10	10

General trend in inter-quintile differences: All inter-quintile comparisons (10 comparison groups)

A cursory examination of the data in Table 3 indicates that, in general, coverage for maternal care services increases with wealth quintile. The only exception to this trend is seen among currently married women age 15-49 years who reported use of a modern method of contraception, where the highest coverage is seen among those belonging to the third quintile.

This trend is further highlighted by the inter-quintile differences in coverage, with the magnitude of differences generally increasing as one moves from the lowest to the highest income quintile group as shown in Table 4. This trend can also be expressed as follows:

$$Q_1\text{-}Q_4 > Q_1\text{-}Q_3 > Q_1\text{-}Q_5 > Q_1\text{-}Q_2 > Q_2\text{-}Q_5 > Q_2\text{-}Q_4 > Q_3\text{-}Q_5 > Q_3\text{-}Q_4 > Q_2\text{-}Q_4 > Q_4\text{-}Q_5$$

The highest inter-quintile difference was between the lowest and highest quintiles for facility-based delivery ($D_{Q1\text{-}Q5}$ –58.4% [95% CI –61.2% to -55.6%]), while the lowest was found for antenatal coverage between the second and third quintiles ($D_{Q2\text{-}Q3}$ –0.4% [95% CI –1.9% to 1.1%]).

General trend in inter-quintile differences: Adjacent quintiles (four comparison groups)

There is a decreasing trend in differences in coverage for maternal care services between adjacent quintiles as the comparison moves from the lowest to the highest income quintile groups (i.e., $Q_1\text{-}Q_2 > Q_2\text{-}Q_3 = Q_3\text{-}Q_4 > Q_4\text{-}Q_5$). For instance, the inter-quintile difference between the first and second quintiles is at most about a third higher than those between the fourth and highest quintiles (skilled attendance at birth $D_{Q1\text{-}Q2}$ –28.8% [95% CI –32.0% to –25.6%]; facility based delivery $D_{Q4\text{-}Q5}$ –9.7% [95% CI –12.5% to –6.9%]).

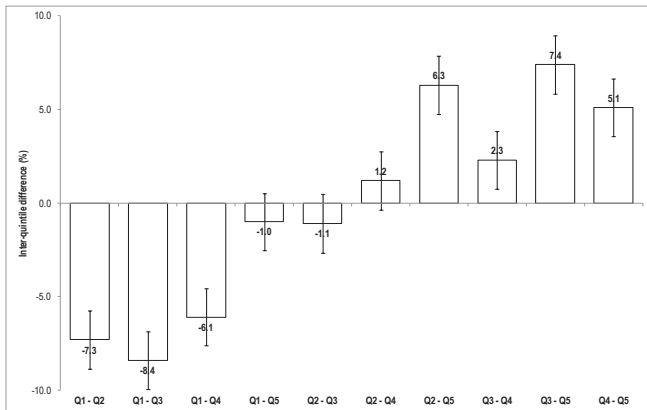*Current use of any modern method of contraception*

Women who belong to the lowest income quintile have lower reported use of any modern method of contraception[a] when compared to higher wealth groups (Figure 1). The gap is highest between the first and third quintiles ($D_{Q1\text{-}Q3}$ –8.4% [95% CI –11.4% to –5.4%]), while there is an almost negligible

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[a] For purposes of discussion, *modern methods of contraception* include permanent methods (bilateral tubal ligation and vasectomy), artificial methods (intrauterine devices, oral pills, injectables and implants), and natural methods (cervical mucus method, basal body temperature, symptothermal method, standard days method, and lactational amenorrhea method. [17]

difference between the first and fifth quintiles (D_{Q1-Q5} –1.0% [95% CI –4.0% to 2.0%]). On the other hand, the second to fourth income quintiles have a higher reported use of any modern method of contraception when compared to highest wealth group (D_{Q2-Q5} 6.3% [95% CI 3.2% to 9.4%]; D_{Q3-Q5} 7.4 [95% CI 4.3% to 10.5%]; D_{Q4-Q5} 5.1% [95% CI 2.1% to 8.1%]).

Antenatal care from a skilled professional

There is greater coverage among higher compared to lower wealth groups as indicated by the differences in reported receipt of antenatal care from a skilled provider[b] (Figure 2), with the highest gap found among those who belong to the lowest income quintile (D_{Q1-Q2} –7.8% [95% CI –9.9% to –5.7%]; D_{Q1-Q3} –8.2% [95% CI –10.3% to –6.1%]; D_{Q1-Q4} –10.9% [95% CI –12.7% to –9.1%]; D_{Q1-Q5} –10.1% [95% CI –12.0% to –8.2%]). The magnitude of differences between the higher quintile groups (Q_2 to Q_5) is almost a third lower than those between the lowest and next higher income groups.
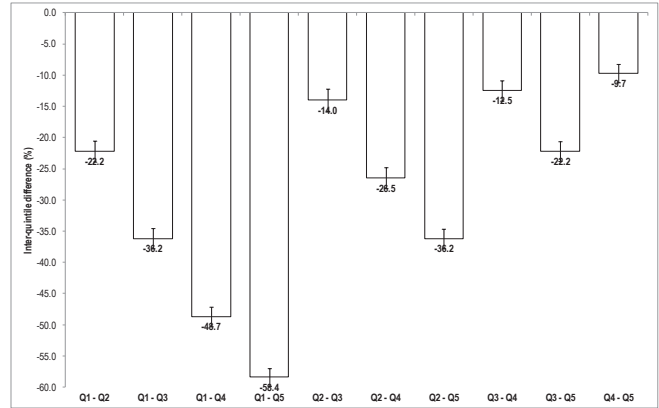

Figure 1. Inter-quintile differences in reported use of any modern method of contraception among currently married women aged 15-49 years, Philippines, 2013.
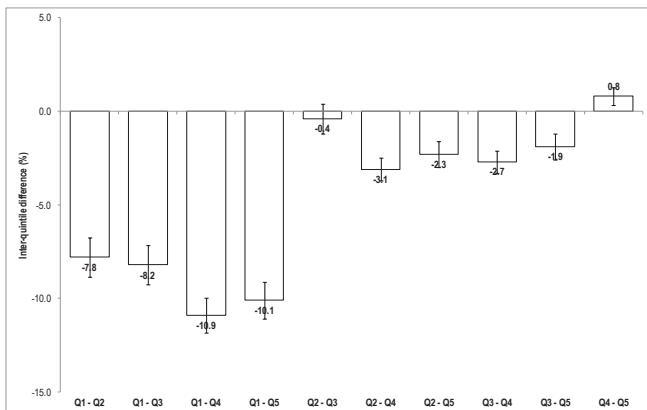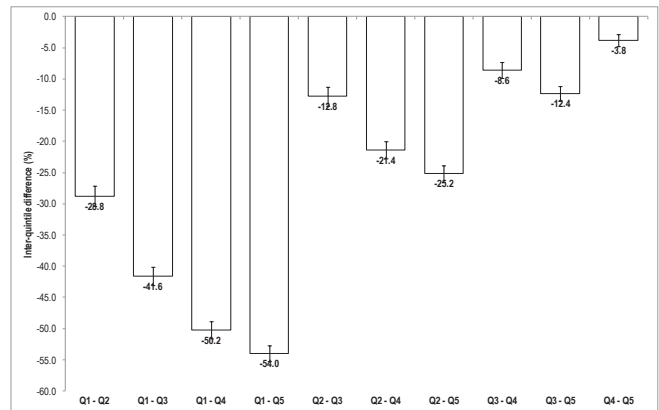

Figure 2. Inter-quintile differences in reported receipt of antenatal care form a skilled provider among women age 15-49 years who had a live birth in the preceding five years, Philippines 2013.

[b] *Skilled providers of antenatal care* include physicians, nurses and midwives.[17]

Figure 3. Inter-quintile differences in live births in the preceding five years reported as having been delivered in a health facility, Philippines 2013.

Figure 4. Inter-quintile differences in live births in the preceding five years reported as having been delivered by a skilled professional, Philippines 2013.
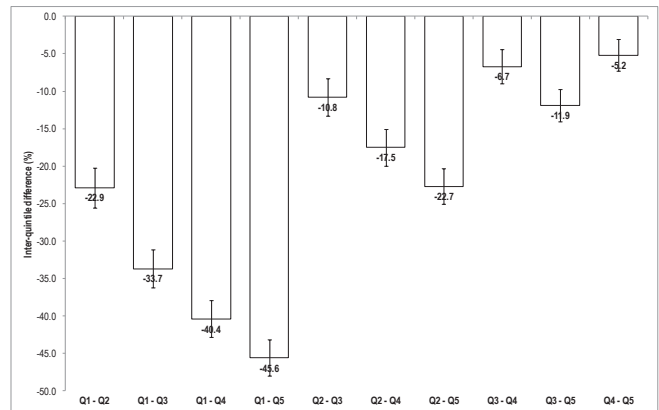
Figure 5. Inter-quintile differences in reported receipt of postnatal care among women with a live birth in the preceding two years, Philippines 2013.

Facility-based delivery

A consistent increasing trend in inter-quintile differences is notable with respect to delivery of a live birth in a health facility (Figure 3). The second income quintile, for

instance, has a reported coverage about 20 percentage points higher than the lowest income quintile (D_{Q1-Q2} -22.2% [95% CI –25.5% to –18.9%]). This difference more than doubles between the first and highest income quintiles (D_{Q1-Q5} –58.4% [95% CI –61.2% to –55.6%]). The difference in coverage between the two highest quintiles indicate that about 10% more women who belong to the fifth income quintile delivery in a health facility compared to those who belong to the fourth income quintile (D_{Q4-Q5} –9.7% [95% CI –12.5% to –6.9%]).

Skilled attendance at birth

The trend in inter-quintile differences in skilled attendance at birth[c] (Figure 4) is almost the same for facility-based delivery (D_{Q1-Q2} –28.8% [95% CI –32.0% to –25.6%]; D_{Q1-Q5} –54.0% [95% CI –56.5% to –51.5%]), although the differences in coverage between the higher quintiles is of a lower magnitude compared to those for facility-based delivery. For instance, the difference between the two highest quintiles is less than 5% (D_{Q4-Q5} –3.8% [95% CI –5.7% to –1.9%]).

Postnatal care

Receipt of postnatal care within two days after delivery is highest for the firth income quintile, resulting to a difference in coverage ranging from 5% to almost 50% when compared to lower income groups (D_{Q1-Q5} –45.6% [95% CI –50.3% to –40.9%]; D_{Q2-Q5} –22.7% [95% CI –27.4% to –18.0%]; D_{Q3-Q5} –11.9% [95% CI –16.2% to –7.6%]; D_{Q4-Q5} –5.2% [95% CI –9.3% to –1.1%]).

Discussion

This paper examined the magnitude of inter-quintile differences in reported coverage for specific maternal care services among Filipino women. Quantified inter-quintile differences range from as low as less than 1% to as much as 60%. On the other hand, there is a three-fold difference in coverage between the two lowest and the two highest adjacent quintiles across all maternal care services. With the exception of use of modern method of contraception and receipt of antenatal care, analysis carried out for this research showed that higher wealth groups almost always have greater access to maternal care services compared to those who belong to lower income groups. Even differences in coverage for maternal care services between the two highest quintiles amount to at most 10%.

The data generated by this paper confirm gradients in socioeconomic status and health service access noted elsewhere.[14] Such differences in access persist even among women who belong to the fourth and highest quintiles. Thus, it can be said that disparities in access to maternal care services, differing only in magnitude, exist among Filipino

women across the economic spectrum. Furthermore, the existence of these differences despite the presence of government interventions to reform the health system to ensure greater access to health services at both the primary and specialized care levels[4,18,19] serve to highlight the inadequacy of such measures to reduce inequities that are "systemic, socially produced, and unfair."[11]

To the author's knowledge, this is the first paper that measured the gap, or difference, in access to maternal care services among Filipino women. One limitation of the current paper is its reliance on summary statistics contained in the published technical report of the most recent demographic and health survey in the Philippines. A second limitation is its use of data that may be subject to information bias and selection bias, which may off-set by the large sample size attained for the survey through stratified two-stage sampling design; extensive pre-testing of questionnaire; and training of data enumerators. These limitations notwithstanding, the accuracy of point and interval estimates for inter-quintile differences in access to maternal care services presented in this paper is driven by the robustness of the source data used in the analysis.

Future research must determine whether inter-quintile differences in access to maternal care services has changed over the past decades, a more strategic information that will drive policy and practice considering that we have not been lacking in well-intentioned government and private initiatives in the past decades. Likewise, gaps in access to other essential health interventions, such as child care, need to be examined as well. Use of primary data for such future undertakings is ideal.

Conclusion

Gradients in access to selected maternal care services exist among Filipino women who belong to different wealth quintiles. The call for stakeholders, therefore, is to intensify efforts to narrow such gaps because, within and across communities, we affirm that no women "should die in the course of the normal process of reproduction" and no families must suffer the devastating consequences of such an occurrence.[20]

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[c] Skilled birth attendants include physicians, nurses and midwives.[17]

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