

Burden of Exposure to Domestic Violence on Deliveries Assisted by Skilled Health  
Personnel among Women Living in Disparity: Global Perspective

**Abstract:**

Millennium Development Goal 5 calls for increasing proportions of deliveries assisted by skilled health personnel to reduce maternal mortality. This study aims to identifying the independent and joint burden of exposure to domestic violence on these proportions.

Methodology: the study used domestic violence modules data of Demographic & Health Surveys (DHS) of six countries from different geographical and economic levels in the period of 2005 to 2007. Proportions of assisted deliveries were examined against different types of domestic violence and variables of disparity (poverty, lack of education and residence) with significance tests. Multiple regression analysis was conducted to assess the independent burden of domestic violence. Results: Data sets of 18,507 participants over 20 years of age showed that almost three quarters (73%) of women had deliveries assisted by skilled health personnel. Exposure to domestic violence declined the proportions to 71%. Joint burden with disparity led to further decline to 61% (OR 2.3; 95%CI: 2.1-2.4) with highest burden in low income countries (27%, OR: 16.2; 95%CI: 13.9-18.7) then with sever violence (55%, OR 2.4; 95%CI: 2.1-2.7). Independent burden of domestic violence (OR 1.4; 95%CI 1.3-1.5) was not biased by the stronger influence of disparity or living in low income country. Conclusion & recommendations: Domestic violence has an independent and extra burden with disparity on reducing assisted

deliveries by skilled health personnel. Integration of protecting women from domestic violence is recommended for programs working for increasing proportions of assisted deliveries by skilled health personnel.

### **Introduction:**

Millennium Development Goal 5 (1) aims to improve maternal health through reducing maternal mortality by three quarters by 2015; and achieving universal access to reproductive health services. The leading causes of maternal mortality in developing regions are hemorrhage and hypertension, which together account for half of all deaths in expectant or new mothers. The vast majority of these deaths are avoidable. Hemorrhage, for example, which accounts for over one third of maternal deaths, can be prevented or managed through a range of interventions administered by a skilled health-care provider with adequate equipment and supplies. World Health Organization defines a skilled birth attendant as “an accredited health professional – such as a midwife, doctor or nurse – who has been educated and trained to proficiency in the skills needed to manage normal (uncomplicated) pregnancies, childbirth and the immediate postnatal period, and in the identification, management and referral of complications in women and newborns (2). Traditional birth attendants, who are not formally trained, do not meet the definition of skilled birth attendants (3). Developing countries continue to account for 99 per cent of all maternal mortalities. Sub-Saharan Africa and Southern Asia account for 87 per cent of global maternal deaths. (4).

Poor social and economical situation was found (5) to have a detrimental impact on the use of maternal health care services, which might be associated with poor education and low financial capacities of the women. Besides education and wealth, the main predictors of place of delivery included being advised during antenatal care to deliver at a health facility, pregnancy wanted, and parity. There were substantial use-inequities in maternal health by asset quintiles, distance, and area of residence, and education of both the woman and her husband (6)

Domestic violence against women is a worldwide problem. The reported lifetime prevalence of physical or sexual partner violence, or both, varied from 15% to 71% (7). Despite wide variations in the prevalence of intimate partner violence (IPV), many factors affected IPV risk similarly across sites. Secondary education, high SES, and formal marriage offered protection, while alcohol abuse, cohabitation, young age, attitudes supportive of wife beating, having outside sexual partners, experiencing childhood abuse, growing up with domestic violence, and experiencing or perpetrating other forms of violence in adulthood, increased the risk of IPV. The strength of the association was greatest when both the woman and her partner had the risk factor.(8) In addition to being a breach of human rights, intimate partner violence is associated with serious public-health consequences that should be addressed in national and global health policies and programs (9,10,11, 12,13,14,15). Exposure to domestic violence was found to be a barrier to women access to health care specifically among vulnerable groups of women (16, 17).

High rates of domestic violence and disproportionately high maternal mortality ratios in developing countries are recognized as global public health problems. Domestic violence

and maternal mortality are linked because some women die from domestic violence while pregnant or during the period following the end of pregnancy. However, it is not yet known what proportion of maternal mortality is due to domestic violence, whether there are differences between countries in that proportion, and what factors could explain any such differences. The main problem in estimating the contribution of domestic violence to the maternal mortality ratio rests in the current international definition of maternal death used by most countries. This definition does not consider incidental or accidental causes of death, and thus excludes deaths from domestic violence from the numerator of the maternal mortality ratio formula. (18).

In spite of the international efforts to reduce the maternal mortality rates through skilled birth attendants, there is a gap of literature relating the impact of domestic violence on utilization of assisted deliveries by skilled health personnel. The aim of this study is to identify the independent and joint burden with disparity of exposure to domestic violence on the proportions of deliveries assisted by skilled health personnel

### **Methodology:**

#### *Study design:*

The study used secondary data analysis of Domestic Violence Modules of Demographic Health Surveys (DHS) from 6 different countries. Each is representing one of the six WHO regions all used the domestic violence module of DHS in the period of 2005 to 2007. They were Bangladesh 2007; Cambodia 2005; Colombia 2005; Egypt 2005; Ukraine 2007 and Zambia 2007.

*Variables:*

Domestic Violence was defined in this study as ever exposure of the studied women to any act of physical, emotional or sexual violence from husband/partner. Assisted delivery by skilled health personnel was defined as deliveries assisted by a doctor, nurse or trained midwife.

Different variables of disparity were identified as: poverty, lack of education and rural residency. Poverty was identified according to the wealth index as being poorest and poorer levels. Lack of education was considered from the educational level of women for those who have no education.

*Data management:*

Description of both economic trends and maternal mortality was conducted through analysis of the data available on these countries (19, 20). The data files of the different six countries were downloaded in SPSS format and merged in one file for estimation of the total population under study. Since adolescence has different set of reproductive health problems, participants aged 15-19 years were excluded from the data file. Data analysis was conducted using SPSS version 13. Prevalence of exposure to different types of domestic violence and variables of disparity were measured. Proportion of assisted deliveries was examined against different types of domestic violence and variables of disparity (poverty, lack of education and residence) with significance test of Odd Ratio (OR) and 95% Confidence Interval (CI). Reduction in proportion of having assisted deliveries among those exposed to both of domestic violence and live in disparity in the

same time was measured among different countries. To determine the independent influence of exposure to domestic violence, multiple regression analysis was conducted.

*Ethical considerations:*

Permission to download and use the data was obtained from Measure DHS macro Inc. The data were previously de-identified to keep the confidentiality of the surveys participants.

**Results:**

Data sets had total of 18,507 participants from the six different countries all over 20 years of age. Half of the studied countries (Bangladesh, Cambodia and Zambia) were among the Low- income economics according to the World Bank classification (19) of having GNI of less than \$995. Egypt and Ukraine were among the Lower-middle-income economies (\$996 to \$3,945) while Colombia was higher from the Upper-middle-income economies (\$3,946 to \$12,195). All countries showed increase in their economy throughout the 15 years period from 1995 to 2009.

Maternal mortality ratio from the selected countries for the same period showed the same pattern as the poorest countries (Bangladesh, Cambodia and Zambia) have higher maternal mortality rate with highest in Zambia (470/100,000). Countries with higher income had lower maternal mortality rate specifically Ukraine that had 26 per 100,000 only meanwhile both of Egypt and Colombia has 85 and 82 respectively (20).

As table (1) shows, almost three quarters (73%) of women had deliveries assisted by skilled health personnel as doctors (60%) and nurses/midwives (13%). This varied from

country to other as it was almost universal in Ukraine, followed by Colombia (91 %) then Egypt (78%). Other countries were less as Zambia (53%); Cambodia (41%) and Bangladesh (23%) only. Countries with low income (Bangladesh, Cambodia and Zambia) had statistically significant lowest proportions of 41%, meanwhile middle income (Egypt & Ukraine) and higher income countries (Colombia) had higher proportions (82% and 91% respectively)

*Exposure to Domestic Violence and living in disparity:*

Almost half of the studied women were exposed to any type of domestic violence (table 2). Zambia had the highest prevalence of domestic violence (54%) followed by both of Colombia and Bangladesh (49% each) meanwhile it was the least in Ukraine (18%). Prevalence of exposure to domestic violence was higher in low income countries in general (46%).

Emotional violence as humiliation, threatening and belittling was among 29% of the women (excluding Bangladesh) and it was highest in Colombia (35%). Physical violence as slapping, punching, twisting arm and beating was prevalent among more than one third of the women (37%) and it was highest in both of Bangladesh (49%) and Zambia (47%). Sever violence as burning, strangling and attacking with weapon was 9 % only; however, it was higher in both of Bangladesh (16%) and Zambia (14%). Sexual violence as having forced sex was prevalent among 10% of the women (excluding Bangladesh) and it was highest in Zambia (17%).

Most of (64%) the women of the different studied countries were living in one or more kind of disparity. It was the highest in Cambodia (88%) and the least in Ukraine (52%).

Disparity was statistically significant highest in low income countries (75%). Half of studied women lived in poverty (49%). It was highest in Colombia and Cambodia (53% each). Women with no education constituted 13% of the studied participants. It was highest as 33% in both of Bangladesh and Egypt, while it was universally absent in Ukraine. Around 47% of the studied women in different countries lived in rural areas with highest in Cambodia (81%).

Women who were both exposed to domestic violence and lived in disparity constituted 29% of the studied ones. They were statistically significant more in low income countries (34%) especially in both of Bangladesh (39%) and Zambia (36%).

*Exposure to violence, Disparity and assisted deliveries:*

Those who were ever exposed to any kind of domestic violence were less to have assisted delivery (72% VS 75% among unexposed ones) and they were more likely to have unassisted delivery (OR 1.2; 95%CI 1.1-1.3). With exception of both Ukraine and Zambia, women in all other countries who were exposed to domestic violence had statistically significant less assisted delivery by skilled health workers (Table 3).

Bangladesh women showed the lowest proportion (15 %) and were three times the unexposed ones to have unassisted deliveries (OR 2.5; 95%CI: 1.9-3.1). Exposure to domestic violence statistically significant decreased the proportion among low income countries to 39%, middle income to 76% and higher income to 90%. Women exposed to domestic violence in the lower income countries were 15 times (OR 14.7; 95%CI: 13.0-16.7) those living in the upper middle income countries to have unassisted deliveries.



Exposure to emotional violence statistically significant led to decrease of assisted deliveries in Egypt (75% Vs 79%) and Colombia (90%VS 92%) for unexposed, meanwhile it looked to increase the proportion among exposed in Zambia (56% Vs 52%). Women exposed to emotional violence and living in low income countries were 9 times those exposed to it and living in upper middle income ones (OR 8.5; 95%CI: 7.1-10.1) to have unassisted deliveries. Those exposed to physical violence were statistically significant less to have assisted deliveries by skilled health personnel (69% VS 76 % of unexposed ones). Exposure to physical violence decreased assisted deliveries in all countries except Colombia and Zambia. Women living in Bangladesh and exposed to physical violence were three times the unexposed to have unassisted deliveries (OR 2.5; 95%CI: 2.0-3.1). Women exposed to physical violence and living in low income countries were 16 times those living in upper middle income countries to have unassisted deliveries ( OR: 16.1; 95%CI: 13.9-18.5). Women exposed to sever violence were the lowest (65% VS 74% of unexposed ones) to have assisted deliveries by skilled health personnel. Women in Bangladesh, Ukraine and Colombia who were exposed to sever violence had statistically significant lower proportions of assisted deliveries. Women in Bangladesh showed the lowest decrease of 14% VS 24% among unexposed. Women exposed to sever physical violence and living in low income countries were 12 times those living in upper middle income countries to have unassisted deliveries ( OR: 12.1; 95%CI: 9.3-15.7). Exposure to sexual violence decreased the proportion of assisted deliveries to 77% Vs 79% among unexposed. Women exposed to sexual violence were more likely to have unassisted deliveries (OR 1.1; 95% CI: 1.1-1.3). However, it was not statistically significant in any of the countries or among different economic levels.

Living in disparity led to decline of proportions of assisted deliveries to 62% VS 93% for those not living in disparity and they were 8 times to have unassisted deliveries (OR 8.2; 95% CI: 7.4-10.1). With exception of Ukraine, women living in disparity at all countries had lower proportions of assisted deliveries with lowest at Zambia (39% VS 87%) and Bangladesh (12% VS 54%) and they were 10 and 8 times respectively less to have assisted deliveries than those who were not living in disparity in these countries. Living in disparity in low income countries led to decrease the proportion to 30% VS 76% for those who were not living in disparity and they were 14 times less to have assisted deliveries than those living in disparity in upper income countries (OR 14.0; 95%CI: 12.6-15.5). Poor women were 3 times less to have assisted deliveries than richer ones (64% VS 82% with OR 2.6; 95%CI: 2.4-2.8). Poverty statistically significant reduced the proportion in all countries except Ukraine. Poor women in low income counties were 18 times less likely to have assisted deliveries compared to higher income ones as it reached to 24% Vs 85% in higher income countries with OR: 18.0; 95%CI: 16.0-20.3). Bangladesh showed the lowest proportion with poverty (8%). Uneducated women were 7 times less to have assisted deliveries (36% VS 79% for educated ones with OR: 6.7; 95% CI: 6.1-7.3). With exception of Ukraine, all countries showed statistically significant lower proportions among uneducated women with lowest in Bangladesh 4 %.

Uneducated women in low income countries were 10 times less to have assisted deliveries (16% VS 63% among higher income ones, with OR 9.6; 95%CI: 7.3-12.5).

Women residing in rural areas were 8 times less to have assisted deliveries as they had 54% VS 90% among urban residents (OR 7.8; 95%CI: 7.2-8.4). With exception of Ukraine, rural residence lowered proportions in all countries. Rural residents in low

income countries were 8 times less to have assisted deliveries compared to those in higher income countries (31% VS 78% with OR: 8.1; 95%: 7.2-9.1).

*Burden of exposure to domestic violence on assisted delivery:*

Exposure to domestic violence among women living in disparity led to further decline of assisted deliveries proportions to 61% VS 78% among those who were not exposed to any, with OR 2.3; 95%CI: 2.1-2.4 (Table 4). With exception of Ukraine, all countries of different economic levels showed significant decline. Women living in disparity and exposed to any violence in Bangladesh showed the highest decline and were 5 times to have unassisted deliveries.

Women living in low income countries with both exposures to violence and disparity were 16 times less to have assisted deliveries than those living in higher income countries (27% VS 85%; with OR: 16.2; 95%CI: 13.9-18.7). Fig 1 summarizes the proportions of assisted deliveries.

Exposure to emotional violence among women living in disparity did not influence proportion of assisted deliveries in general in spite that it increases the proportions in some countries. Exposure to physical violence among women living in disparity led to decline of assisted deliveries to 59% and it was statistically significant among all countries with all economic levels. Lowest proportions of deliveries were among those living in disparity and exposed to sever types of violence (55%) even among countries with almost universal access as in Ukraine (90%) and Colombia (84%). Those exposed to sever violence in Cambodia or Zambia showed lower proportion; however, it was not

statistically significant. Exposure to sexual violence led to statistically significant decline in both of Colombia and Zambia only.

As table 5 shows when running logistic regression, exposure to domestic violence kept its statistical significance influence of more likely to lead to unassisted delivery, and was not biased by the stronger influence of disparity or living in low income country even after splitting components of disparity. The table shows also that living in a low income countries had the odd of 4 times likely to have unassisted delivery. Lack of education was the strongest component of disparity that influenced the proportion of unassisted deliveries.

### **Discussion:**

Maternal mortality is unacceptably high. The high number of maternal deaths in some areas of the world reflects inequities in access to health services, and highlights the gap between rich and poor. There are also large disparities within countries, between people with high and low income and between people living in rural and urban areas (21, 22). The results of the present study confirmed these inequalities of access to assisted deliveries by skilled birth attendants, with exception of Ukraine that showed universal access in spite that it was not the highest in income; however, the highest in educational level. Low income countries showed the highest levels of both disparity and exposure to domestic violence and suffered the highest burden of them especially Bangladesh in lowering proportions of .assisted deliveries. The present study confirmed the strong impact of lack of education and poverty (23, 24) on having assisted deliveries.

Burden of both physical and severe violence on lowering proportions of assisted deliveries among women living in disparity was higher than those exposed to either emotional or sexual violence. This agrees with other research findings (25) that abused women who sought formal help were more likely to be exposed to physical and severe and long-lasting physical IPV.

The results of the present study showed that the burden of exposure to any kind of domestic violence was not biased by the stronger influence of living in disparity or in low income country. Meanwhile international efforts led by the United Nations in the form of MDG5 in decreasing maternal mortality through strengthening training of skilled birth attendants and upgrading infrastructures, it was not integrated with the other efforts to end violence against women (26). The present study calls for integrating protection of women against exposure to domestic violence in programs working on reducing maternal mortality especially for women living in disparity.

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*Table 1: Assistance in deliveries in different countries*

<i>Country</i>	<i>Doctor</i>	<i>Nurse/ Midwife</i>	<i>Skilled health personnel</i>	<i>Traditional birth attendant</i>	<i>Relative/ Others</i>	<i>No one</i>	<i>Total</i>
<b><i>Low income</i></b>			<b>41.4</b>				
Bangladesh 2007	15.5	7.0	<b>22.6</b>	10.4	65.4	1.5	1821
Cambodia 2005	6.1	35.4	<b>41.5</b>	57.4	1.0	0.1	1266
Zambia 2007	3.4	49.5	<b>52.9</b>	22.5	21.3	3.4	2977
<b><i>Low middle</i></b>			<b>81.5</b>				
Egypt 2005	72.7	5.6	<b>78.3</b>	19.8	1.2	0.7	2733
Ukraine 2007	91.7	7.9	<b>99.6</b>	0.0	0.2	0.2	481
<b><i>Upper middle</i></b>							
Colombia 2005	88.3	2.9	<b>91.3</b>	5.5	2.8	0.4	9229
<b><i>Total</i></b>	59.6	13.3	<b>73.2</b>	14.3	11.9	1.0	18507

Table 2: Prevalence of exposure to domestic violence and living in disparity in different countries

	<i>Low income</i>			<i>Low middle</i>		<i>Upper middle</i>	<i>Total</i>
	<i>Bangladesh</i>	<i>Cambodia</i>	<i>Zambia</i>	<i>Egypt</i>	<i>Ukraine</i>	<i>Colombia</i>	<i>%</i>
<b><i>Domestic Violence:</i></b>	<b>48.9</b>	<b>23.0</b>	<b>54.1*</b>	<b>33.8</b>	<b>17.7</b>	<b>49.1</b>	<b>45.0</b>
Emotional	---	18.8	24.6	16.7	15.6	34.7*	28.2
Physical	48.7*	13.1	46.9	30.3	8.9	36.8	36.3
Sever	15.7*	5.9	13.6	1.5	2.3	9.1	9.0
Sexual	----	2.8	16.5*	5.7	2.1	9.8	9.6
<b><i>Disparity</i></b>	<b>75.6</b>	<b>87.7*</b>	<b>70.1</b>	<b>67.4</b>	<b>51.8</b>	<b>55.9</b>	<b>63.9</b>
Poor	42.4	53.1	43.9	40.8	42.4	53.3*	48.6
Uneducated	30.0	25.8	14.3	30.4*	0.2	3.9	13.5
Rural resident	63.3	80.6*	68.3	58.5	42.0	28.1	46.5
<b><i>Both</i></b>	<b>39.1*</b>	<b>20.5</b>	<b>36.0</b>	<b>23.9</b>	<b>11.2</b>	<b>29.1</b>	<b>29.4</b>

N= 18,507

\* p<0.05

Table 3: Proportions of deliveries assisted by skilled health personnel among women exposed violence and living in disparity to in the different countries

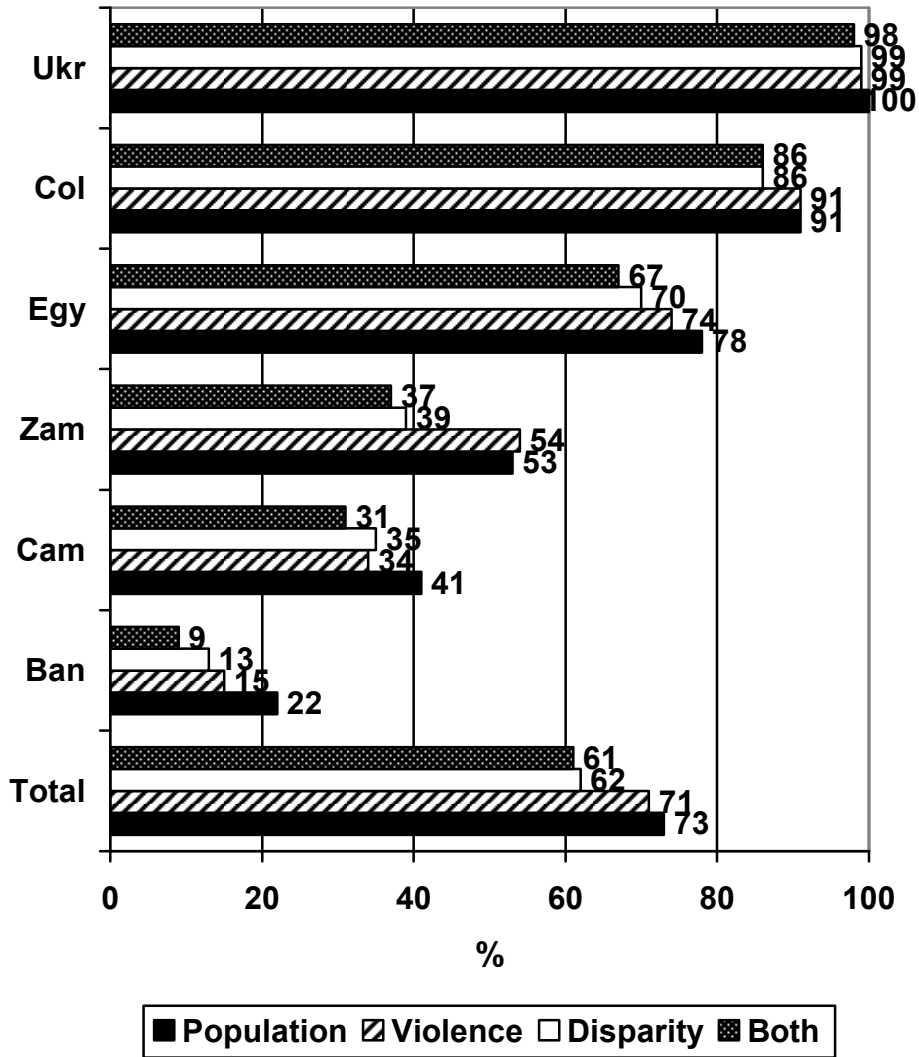
	<i>Low income</i>			<i>Low middle</i>		<i>Upper middle</i>	<i>Total</i>
	<i>Bangladesh</i>	<i>Cambodia</i>	<i>Zambia</i>	<i>Egypt</i>	<i>Ukraine</i>	<i>Colombia</i>	<i>%</i>
<b><i>Domestic Violence:</i></b>	<b>14.8*</b>	<b>35.1*</b>	<b>53.2</b>	<b>74.3*</b>	<b>98.8</b>	<b>90.4</b>	<b>71.5*</b>
Emotional	---	37.0	56.1*	74.5*	98.7	90.0*	<b>80.7</b>
Physical	14.8*	34.3*	52.5	74.1*	97.7*	90.6	<b>69.3*</b>
Sever	13.6*	41.3	54.8	75.6	90.9*	88.1*	<b>64.8*</b>
Sexual	---	38.9	53.9	80.0	100.0	89.7	<b>76.7</b>
<b><i>Disparity</i></b>	<b>12.4*</b>	<b>35.7*</b>	<b>38.6*</b>	<b>70.0*</b>	<b>99.2</b>	<b>85.7*</b>	<b>62.0*</b>
Poor	7.8*	23.7*	34.3*	61.1*	99.0	85.2*	<b>63.8*</b>
Uneducated	4.4*	18.3*	27.9*	56.1*	100.0	63.9*	<b>36.1*</b>
Rural resident	13.4*	36.0*	38.0*	69.4*	99.0	78.2*	<b>53.9*</b>
<b><i>Total</i></b>	<b>22.6</b>	<b>41.5</b>	<b>52.9</b>	<b>78.8</b>	<b>99.6</b>	<b>91.3</b>	<b>73.2</b>

N= 18,507

\* p<0.05

# for N=16,683

Fig 1: Proportion of Assisted deliveries by skilled health personnel among those exposed to domestic violence and disparity



*Table 4: Proportion of Deliveries assisted by skilled health personnel among women exposed to both of different types of domestic violence with disparity*

Country	Emotional	Physical	Sever	Sexual	Any (OR ;95%CI)
<b>Bangladesh</b>	-	9.0*	8.7*	-	<b>9.1* (4.5; 3.4-6.1)</b>
<b>Cambodia</b>	33.6*	30.6*	40.3	37.9	<b>31.7*(1.7; 1.3-2.3)</b>
<b>Colombia</b>	84.9*	85.7*	83.7*	84.7*	<b>85.3* (2.6; 2.1-3.0)</b>
<b>Egypt</b>	68.8*	66.4*	62.5	76.8	<b>67.1* (2.2; 1.8-2.7)</b>
<b>Ukraine</b>	97.9	96.3*	90.0	100.0	<b>98.1 (NS/NA)</b>
<b>Zambia</b>	39.8*	36.8*	41.1	37.5*	<b>36.8* (2.8; 2.4-3.3)</b>
<b>Low</b>	37.9*	24.9*	27.6*	37.5	<b>26.5* (2.7; 2.4-3.0)</b>
<b>Low medium</b>	72.4*	67.8*	70.6	78.0	<b>69.5* (2.5; 2.0-3.0)</b>
<b>Upper</b>	92.9*	85.7*	83.7*	84.7*	<b>85.3* (2.6; 2.1-3.0)</b>
<b>Total</b>	<b>72.6</b>	<b>58.6*</b>	<b>55.3*</b>	<b>68.1*</b>	<b>61.2*</b>
<b>OR</b>	<b>NA</b>	<b>2.5</b>	<b>2.4</b>	<b>1.3</b>	<b>2.3</b>
<b>95%CI</b>		<b>2.3-2.7</b>	<b>2.1-2.7</b>	<b>1.1-1.5</b>	<b>2.1-2.4</b>

N= 18,507

\* p<0.05

*Table 5: Independent influence of domestic violence on unassisted deliveries (Multiple regression analysis)*

	B	Significance	Exp(B)	95% CI
Violence	0.317	0.000	1.4	1.3-1.5
Disparity	2.076	0.000	8.0	7.2-8.9
Low income country	1.383	0.000	4.0	3.8-4.2
Constant	-5.591	0.000		
Violence	0.339	0.000	1.4	1.3-1.5
Poverty	0.941	0.000	2.6	2.3-2.8
Lack of education	1.098	0.000	3.0	2.7-3.3
Rural residence	1.066	0.000	2.9	2.6-3.1
Low income country	1.344	0.000	3.8	3.6-4.1
Constant	-5.282	0.000		

Model significance: 0.000