Estimating Macroeconomic Loss Due to Violence Against Women and Girls: A Policy Toolkit

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WhatWorks
TO PREVENT VIOLENCE
Economic and Social Costs of Violence Against Women and Girls
ISSER
University of Ghana
Knowledge for Development
UKaid
from the British people

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Authors acknowledge Emily Esplen, Maria Floro, Claire MacPherson, and A.K. Shivakumar for their comments and inputs on earlier drafts of this paper. This work has been funded by UK Department for International Development. However, the views expressed or the information contained in this paper are not necessarily those of, nor endorsed, by DFID.

Suggested Citation: Raghavendra, S., Kim, K., Ashe, S., Chadha,M., Piiroinen, P.T. and Duvvury, N. (2019). Estimating Macroeconomic Loss Due to Violence Against Women and Girls: A Policy Toolkit. Galway: NUI Galway

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LIST OF ABBREVIATIONS

DHS	-	Demographic and Health Survey
GHC	-	Ghanaian cedi
GDP	-	Gross domestic product
IOT	-	Input-output table
IFPRI	-	International Food Policy Research Institute
IPV	-	Intimate partner violence
SAM	-	Social accounting matrix
SDG	-	Sustainable Development Goal
USD	-	United States dollar
VAW	-	Violence against women
VAWG	-	Violence against women and girls

1. INTRODUCTION

Violence against women and girls (VAWG) is a widely recognised human rights violation with serious consequences for the health and well-being of women, with ramifications for households, businesses, communities and society overall. Even though violence against women is widely accepted as a fundamental human right and public health issue, its wider impact on development is being recognised only recently. There are only few studies that estimate the costs of VAWG. For example, Fearon and Hoeffler (2015) estimate the costs to the global economy to be about USD$4 trillion in 2013.[1] There are even fewer studies particularly of developing countries that outline the national-level economic costs of such violence.[2] While these studies establish the costs of VAWG, the wider ramifications of VAWG to the economy and economic development are now being investigated. Duvvury et al. (2013) is the first study to establish the link between violence against women and the wider economy through the production structure of the economy. Taking the cue from this study, Raghavendra et al. (2017), further developed an analytical framework to study the impact of VAWG on the overall economy using violence against women survey data from Vietnam.

The importance of establishing both the individual level costs of VAWG and its impact to the overall economy cannot be overstated, however reductionist it might seem from a theoretical perspective. In the context of renewed commitment to achieve gender equality and eliminate VAWG as part of the internationally agreed Sustainable Development Goals (SDGs), it is particularly important that the issue is recognised as one of the major development priorities in the national economic agenda. In fact, the SDGs further articulate the importance of macroeconomic policies as a crucial enabler of gender equality. A possible reason why the issue of VAWG has not entered the national economic development agenda could be the lack of hard evidence on the impact of violence against women to the overall economy, or to the macro-economy, which is the unit of analysis at the national level development prioritisation exercises. In this context, it is imperative, from a practical perspective of eliminating VAWG, to demonstrate and highlight the wider economic consequences of VAWG for realising SDG 5 by 2030.

1. This estimate is not an annual estimate but a point estimate for 2013.
2. See for example Siddique (2011) for Bangladesh; and Vyas (2013) for Tanzania.

In order to fill this gap and to provide robust evidence on the economic impact of violence against women on broader national economies, the UK Department of International Development funded and supported in-depth studies on the economic and social costs of violence against women in Ghana, Pakistan and South Sudan as part of its global What Works to Prevent Violence programme. The research, based on the comprehensive survey of violence against women and its consequences in these three countries, highlights various pathways of impact of VAWG. In particular, the research establishes the loss of productivity as one of the major consequences of VAWG captured in various dimensions such as absenteeism, presenteeism (being less productive while at work) and missed household production including care work. Further, in order to translate micro-level individual costs to the macroeconomic level, we used a novel approach, which combined the primary field survey and secondary data, to derive the national level costs, or the costs to the economy as a whole.

The analysis shows that the cost of violence is not limited to the income loss to the individual women and their families. The interconnected nature of the economy implies that there is a cost incurred to the whole economy. For instance, the income loss at the individual household level leads to loss in final demand for goods and services from the household sector as a whole and depresses production in various sectors, which in turn inflicts further loss due to reduced employment opportunities. Therefore, the total loss to the economy should include both the direct income loss to households and the indirect income loss to the economy owing to the linkages in the economy. The indirect loss is called the 'multiplier loss' in the literature (Raghavendra et al., 2017).

For example, in terms of Ghanaian economy, one of the countries in our study, the direct income loss to women experiencing violence is GHC1,237 million (USD$284 million), or 0.60% of GDP in 2017. After accounting for the leakages through income taxes and household savings, the direct income loss in the household sector induces a further economy-wide loss, which is the indirect loss which amounts to GHC708.9 million (USD$162.6 million), or 0.34% of GDP. In total, taking both the direct and indirect losses, the macroeconomic cost of VAWG is estimated to be GHC1945.7 million, or 0.94% of GDP, in 2017. In terms of the Ghanaian economy, our analysis shows that Ghana's national GDP in 2017 could have been 0.94% higher in the

absence of VAWG. While the loss is estimated at a point in time, and may seem trivial, the cumulative loss of VAWG, at the same level of prevalence and incidence rates of violence, can be quite substantial – under the assumption of status quo in terms of service provision, it grows to about three-quarters of GDP over a period 14 years in case of Ghanaian economy.[3]

The framework developed here also provides various levels of analysis of the loss due to VAWG to the overall economy. For instance, one can derive the distribution of indirect costs in terms sectors of production, including by geographical location (urban and rural), the sectoral loss of output and tax revenue loss by sectors. Finally, the analysis also shows that the loss due to violence is not just a once off leakage from the macroeconomic circular flow but imposes premium to economic growth, i.e. it shows how far the actual growth rate of the economy is below its potential growth rate when the economy is growing and by how much the actual growth is worse off relative to its potential when the economy is shrinking or in recession.

The analytical framework is a platform for scenario simulation, that could be helpful for policy analysis in various country contexts. In order to facilitate wider applicability, we have further developed this toolkit which will enable the use of the analytical framework and perform the analysis for various scenarios. For instance, users can simulate various scenarios of incidence rates of violence or female labour force participation, and other parameters, to derive all the results of our analysis including the tax revenue loss to the government.

This policy toolkit provides a simple guide for estimating both the direct and indirect costs due to VAWG. The direct loss of income is estimated at a micro/household level and comprises the income lost by the household due to women missing work as a result of experiencing violence. The impact of VAWG, however, does not end at the level of the household but propagates to the rest of economy through the multiplicative interactions between households, productive sectors and government. This is the indirect income loss due to violence. The total loss, i.e. the direct plus the indirect cost of VAWG (hereafter referred to as the macroeconomic loss) is the loss for the entire economy as a result of women missing work due to violence. The macroeconomic loss is estimated using a social accounting matrix (SAM) which is a large comprehensive accounting matrix combining national, industry and

3. See Ghana macro paper for further discussion: Raghavendra, S. et al. (forthcoming 2019, Levi Economics Institute working paper)

household-level accounts. The direct income loss by households is fed into the SAM to calculate the losses across the chain of linkages among the productive sectors (such as agriculture, manufacturing, retail and wholesale, etc) and the household sector.

1.1 Purpose of the Policy Toolkit

The toolkit provides a guide for exploring the different scenarios of macroeconomic loss through altering various parameters of the estimation. For example, by varying the labour force participation rate of women, one can analyse the differential impacts of violence against women on household income (income multiplier), aggregate output (output multiplier) and the revenue loss for the government (tax multiplier). Another added value is that the toolkit also allows for detailed sector-wide assessment of impacts due to violence against women. From the sector specific output multipliers, one can assess to what extent the loss in output, due to VAWG, undermines the multiplier benefits of new investments. For example, the direct/indirect loss ratio was equivalent to 0.57 in Ghana, which means that every $1 of direct loss results in an additional loss of 57 cents via the linkages between production sectors. In other words, the marginal benefit of new investments in production sectors is reduced by half. From the macroeconomic policy perspective, the toolkit is also useful to estimate the cumulative loss arising from continued inaction to highlight how even a small fraction of loss of income from the economy has significant repercussions for the future. The loss due to VAWG can also be seen in relation to economic growth. The toolkit provides a way to articulate the costs to economic growth by estimating the cost premium that violence imposes on growth.

1.2 Key audiences

The target audiences for the toolkit are policy makers and technical staff in national level government departments who influence policy decisions on work programmes and budget allocations. The toolkit is also useful for non-governmental organisations who are involved in advocacy for government spending on violence prevention and expanded service provision for survivors, as well as technical consultants working with them and governments. It will also be useful for international development agencies who would be interested in integrating and articulating the the issue of VAWG in the broader development policy analysis.

1.3 Data requirements and challenges

1.3.1 Social accounting matrix

First and foremost, the toolkit is based on the availability of a social accounting matrix (SAM), which is a fundamental requirement. A SAM is a double-entry table that depicts accounts of economic agents – households, firms, government – that engage in market transactions and transfers. It represents the circular flow of funds in an economy that describes interactions of:

(1) Production activities (productive sectors of the economy) and commodities used (intermediate goods used in production);
(2) Factors of production (capital and labour);
(3) Agents (households, firms, and government);
(4) Capital accounts (the financial side of the macroeconomy); and
(5) Rest of the world (imports, exports and other financial flows).

These transactions are symmetrically arranged (in rows and columns) forming a square matrix that traces the origin and destination of expenditures and income received. Columns and rows of the table represent production, income and consumption flows in a balanced manner: total outlays from an agent (column sum) must equal total receipts to the agent (row sum). For instance, the total value of outputs in vehicle manufacturing must be equal to total payment for inputs used in the production to other agents entitled to the payment.

A SAM provides a framework for linking macroeconomy with microeconomic activities, in particular of households. National accounts of an economy can be disaggregated into microeconomic accounts, through household surveys. The disaggregation augments the distributional and social dimensions of the matrix, and thus allows one to see how total income is distributed across factors and households. For example, labour, a factor of production, can be specified as being male or female, skilled or unskilled. Each industry can be described by the types and amounts of inputs used, including the female/male intensity of labour employed. A SAM also

allows for information on several household types to be constructed depending on specific socioeconomic characteristics, i.e. rural versus urban location. Overall, a particular advantage of the SAM in that it allows for distributional estimates; thus, enabling assessment of specific policies aimed to readdress distributional inequalities within the economy.

The International Food Policy Research Institute (IFPRI) has worked with various low and middle-income countries to produce SAMs. IFPRI has also produced a training guide for understanding social accounting matrices and multiplier analysis (available at **www.ifpri.org/publication/social-accounting-matrices-and-multiplier-analysis**) which is a useful companion source for a fuller understanding of the SAM.

1.3.2 Alternative options to SAM

However, not all countries have a SAM, or have a recent SAM that could be used. In such cases, the input-output table (IOT) can be an alternative. The table delineates the flows of goods and services among all productive sectors as well as across households and government. One could conduct multiplier analysis using an IOT. A drawback of this alternative method is that it is not possible to show distributional implications, such as different impacts of violence in rural versus urban areas. Furthermore, the structure of IOT does not account for household savings, which is a leakage out of the multiplicative system. As a result, the inclusion of the household sector in the analysis tends to overestimate the impact of household spending. For countries without SAM or IOT, one could still calculate approximately multiplicative impact of violence and its direct loss using Keynesian GDP multipliers , where . These indicators are readily available from country national accounts statistics. However, the analysis is limited to the realm of the aggregate indicator, providing little understanding of sector-wide impacts which are crucial for sectoral level planning and investment.

1.3.3 Absenteeism data

Data on absenteeism due to VAWG is imperative for the analysis of macroeconomic loss to the economy due to violence. There are relatively few costing studies that have explicitly measured absenteeism of women from paid work as a result of VAWG

in low and middle-income countries. There a several options to address the issue of lack of data.

1) A good source of data on violence against women is the Demographic and Health Survey (DHS), an internationally recognised survey providing demographic and health data and routinely implemented in most low and middle-income countries.4 In the violence module, specific questions are asked about behaviours of violence experienced and the consequences of such violence including injuries. If there is administrative data within the health system on days for recovery from injuries, then days of absenteeism can be potentially estimated. If such data is not available, an option would be to consult expert opinion to guesstimate likely days of absenteeism due to injury.

2) Another alternative is exploring violence surveys being implemented in partnership with WHO as part of the commitment of national governments to report on prevalence of violence against women under the SDGs 2030. Under Goal 5, governments are required to report against indicator 5.2.1, which is the proportion of ever-partnered women and girls aged 15 years and older subjected to physical, sexual or psychological violence by a current or former intimate partner in the previous 12 months, by form of violence and by age. WHO in partnership with United Nations Statistics Division is providing support to countries to implement surveys for collection of primary data on this indicator. The WHO questionnaire includes a question on the impact on work, thus in countries where this questionnaire is implemented it is likely possible to derive estimates of absenteeism. Country researchers should engage with in-country or regional WHO offices to explore access to this database.

3) Another possibility is health system data on potential absenteeism due to a range of health conditions. Both DHS and WHO surveys ask various health conditions of all women. Such data can be used to establish the increased likelihood of specific illnesses due to violence, and then using the increased risk to estimate likely days of absenteeism.

4) If no estimation of absenteeism using survey data is possible, the last option is to assume the average absenteeism days from the What Works study on Ghana, Pakistan and South Sudan. For example, if the country under consideration is similar to Ghana in terms of culture, female labour force participation and prevalence rates of VAWG, the average number of days missed by women can be assumed to the same as in Ghana. Of course the estimation will be at best a back-of-the-envelope estimate.

It is important to note that most methods, other than conducting a field survey in the country in question, would result in a rough approximation of the days lost due to violence. Estimates on the basis of the options outlined above would of course result in an estimate of macroeonomic loss that is likely to be an underestimate. However even an indicative estimate would still give insight into how violence affects the overall macroeconomy and understanding of the implications for economic growth.

1.3.4 Other data

Data on labour force participation, employment distribution and wages are available in most countries via labour force or living standards surveys that are routinely undertaken in many countries. Other required information such as GDP and tax revenue can be derived from national accounts statistics.

2. STEP BY STEP GUIDE TO USING THE TOOLKIT

The Excel file template of the toolkit contains the following worksheets: Notes, Variables, Multipliers, Results, Cumulative impact, and SAM-GH. The following steps can be taken to estimate the direct and indirect loss of VAWG using the toolkit:

Step 1: Estimating micro level figures

The first step to estimate direct loss due to VAWG is to produce the following estimates as per location (rural–urban):

1a) Proportion of working women experiencing violence and missing work (absenteeism) as seen in Worksheet Variables Cell (B;C 21)
1b) Mean days lost by women experiencing violence and missing work (absenteeism) as seen in Worksheet Variables Cell (B;C 25)

The users can change the proportion and mean days lost in Step 1 as per the survey results.

Step 2: Availability of national-level figures

The following national-level figures as per location (rural–urban) are also needed for the analysis as per the survey country and updated in the appropriate worksheet cell as outlined below:

2a) Total number of women in the relevant age group as seen in Worksheet Variables Cell (B 10)
2b) Labour force participation rates as seen in Worksheet Variables Cell (B 11)
2c) Number of female workers in rural and urban areas: Worksheet Variables Cell (B 16;17)
2d) Average earnings of female workers in rural and urban: Worksheet Variables Cell (B;C 7)

Step 3: Estimating direct loss

3a: Direct 'income' loss to households is shown in Worksheet Results Cell (B; C 7)

As can be seen by clicking the cells, it comprises of the following calculation:

$$\begin{aligned} &Direct\ income\ loss\ due\ to\ absenteeism \\ &\quad = total\ number\ of\ women\ in\ the\ relevant\ age\ group \\ &\quad * labour\ force\ participation\ rate \\ &\quad * proportion\ of\ working\ women\ experiencing\ violence \\ &\quad * mean\ days\ missed\ by\ women \\ &\quad\quad * average\ daily\ earnings\ of\ women \end{aligned}$$

The direct loss results are automatically produced as the formula is embedded in the cell.

Step 4: Estimating indirect loss

4a: Set a supply constraint on a sector to the rest of the economy as seen in Worksheet Variables Cell (G–I 8)

The parameter with value one, transforms the sector to be exogenous (supply constraint) to the rest of the economy and not accounted for in the multiplier calculation. This constraint reflects the inelastic response of the sector, to a change in the rest of the economy, due to natural resource constraints (i.e. limited availability of arable land) or a fixed production cycle (i.e. farming season).

If you want to set any of these sectors to be endogenous, set the value to zero. Setting them endogenous implies that the sectors' output changes elastically in a short period of time in response to a change in the rest of the economy.

4b: Macroeconomic indicators (GDP and government revenue) as seen in Worksheet Variables Cell (I 11; H 15). A user should input the values in the corresponding cells.

4c: Social accounting matrix and the computation of multipliers

Worksheet SAM-GH contains the original SAM with modified household accounts into one rural and one urban one. Any modification of the matrix may result in computational errors without any output. Calculation of multipliers is carried out in a series of three worksheets: A, I-A and M. The worksheet 'A' contains technical coefficients of each account in the SAM; 'I-A' contains identity matrix with equal dimension as the SAM-GH and the subtraction of A from I matrices. The sheet 'M' contains the Leontief- inverse of I-A, or a full-dimension of the multiplier matrix.

Note that these worksheets should remain intact in order to ensure that multiplier calculation is done correctly. Any modification may result in computational errors.

4d: Multiplier matrix

The direct loss is fed into the matrix. See Worksheet Multipliers Cell (B 109;110)
The types of multiplier available are gross output, GDP, income and tax multiplier in rows 101–104.

The multiplier effect on each commodity account can be seen in row 111 through 122 by type of multipliers aforementioned.

Any modification of the worksheet may result in computational errors.

4e: Indirect losses

The sectoral losses are reported in Worksheet Results Cell (A–H 11–14). These are products of the direct loss by household and the multipliers of interest.

The sectoral losses due to loss of household demand by rural and urban areas are reported in Worksheet Results Cell (A–I 17–23).

The indirect loss would be calculated automatically in the cells.

The total loss (direct loss + indirect loss), i.e. the macroeconomic loss is reported in Cell (A–C 26–31).

Step 5: Cumulative loss

The cumulative loss shows how the loss of GDP at each point in time accumulates over a period of time. The cumulative cost estimation is done to highlight the cost of inaction. Note that the loss of GDP at a point in time is the amount of income the economy loses at the existing level of service provision. If no additional investment is made for increasing the level of service provisioning in the economy, i.e. if the status quo is maintained, the cumulative loss over a period represents the cost of policy inaction. Furthermore, we can also estimate the costs of violence to economic growth. Since the difference between the potential GDP and actual GDP is the income needed to offset the loss to GDP due to violence, we can now pose the question in growth terms. For a given loss of GDP, what is the rate of growth an economy must achieve in order to sustain itself at its potential over a period of time? The cost premium calculations provide a way to articulate the cost of VAWG in terms of economic growth.

The worksheet 'Cumulative impact' shows the calculation of the cumulative loss and the cost to economic growth.
Column B shows the actual and projected GDP by the IMF.
Column C displays the macroeconomic loss per year as a percentage of GDP. The value is linked to the sheet 'Results'.
Column D displays the growth rate of actual and projected GDP by the IMF.
Column E displays the potential GDP (PGDP) which is calculated as

$$PGDP_k = AGDP_0 * (1+g)^k * (1+l)^k \,,$$

Where k, g, and l denote year, actual GDP $(AGDP)$ growth rate, and macroeconomic loss due to VAWG respectively.

Column F shows the loss per year as a gap between potential and actual GDP.
Column G shows the cumulative loss, or the sum of all previous losses per year.
Column H shows the growth rate of potential GDP.
Column I show the growth premium, which is the ratio of relative change in the potential GDP to the relative change in the actual GDP as given by,

$$Growth\ Premium = \frac{PGDP_k - PGDP_{k-1}/PGDP_{k-1}}{AGDP_k - AGDP_{k-1}/AGDP_{k-1}} = 1 + \frac{l(1+g)}{g}.$$

3. CONCLUSIONS AND LIMITATIONS

The Policy Toolkit elaborated here is a practical tool to estimate the direct income loss to women and their families due to VAWG and the loss to the economy as a whole through ripple effects that propagate across the production sectors. This toolkit is based on an innovative methodology of applying the SAM to quantify the multiplier effects of economic costs of violence, which are recognised as important but rarely empirically estimated. It can be used to conduct analysis at various levels and estimate the loss due to VAWG to the economy. For instance, the toolkit can be used to estimate the distribution of indirect costs in terms sectors of production, including by geographical location (urban and rural), the sectoral loss of output, tax revenue loss by sectors and various sectoral multipliers. The sectoral analysis is useful not only for quantifying the contribution to loss of GDP but also provides useful information for developing multi-sectoral intervention prevention strategies. For instance, in Ghana's case the services sector ('Other services' sector in SAM) contributes to about 42% to the loss of Ghana's GDP. The services sector is a combination of various sub sectors such as wholesale and retail trade, transportation and storage, information and communication, finance and insurance, real estate activities, and business services. Thus, the disaggregated analysis of our toolkit can provide further insights into developing multi-sectoral intervention strategies that can create synergies across the sectors.

Additionally policy makers will need to explore how to integrate sectoral prevention policies with broader campaigns on social norm and behaviour change in order to reduce and ultimately end violence against women and girls.

The toolkit can also be used to analyse the loss due to VAWG in relation to economic growth where it can be shown that the loss due to violence is not just a once off leakage from the macroeconomic circular flow but imposes cost premium on economic growth. Thus, the toolkit offers a simple, user-friendly computational tool to analyse the loss due to VAWG at various levels of comprehension and can be valuable for policy analysis, both in the low and middle-income countries and in the advanced countries.

The estimates derived on the basis of the Policy Toolkit have limitations that need to be noted. First, reporting/prevalence of violence against women and girls is often an underestimate for a variety of factors such as culture of silence, stigma and fear of repercussions due to reporting. Consequently, low estimates of the number of survivors would imply that the cost of inaction is also low. The analysis is limited to the extent that it does not take into account the temporal dimension of the impacts due to VAWG. Thus, the loss would be higher if we could have included a wider range of costs of violence such as the impact on capabilities via chronic pain and suffering or the intergenerational loss in human capital. Derived estimates can also be underestimates given that not all impacts can be quantified (such as mental stress) or be assigned monetary value (such as pain and suffering, or fear). Ethical dilemmas also appear in a decision to translate such costs into monetary values, including what value should be assigned and how this is calculated. For these reasons, such costs have not been integrated into the estimates produced via this toolkit. However, the toolkit demonstrates clearly that the longer violence is ignored as a private issue, the losses due to violence will continue to accrue, highlighting the urgency of comprehensive action to reduce and ultimately prevent violence against women and girls.

While the toolkit will provide useful information on macroeconomic implications for policymakers to consider, it must be emphasised that all acts of violence are a fundamental human rights violation. Ultimately, eliminating violence against women and girls is an imperative, regardless of costs, and a moral obligation of governments to ensure women and girls can realise their fundamental human rights.

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